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Simultaneous interpreting and improvised ensemble playing: the role of anticipation

By

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Abstract

This thesis compares cues which may be used for anticipation in simultaneous interpreting and improvised ensemble playing. Previous research by academics has found links between music and language. We have narrowed the focus to simultaneous interpreting and improvised ensemble playing because both disciplines involve listening to and producing sound simultaneously. The focus of the thesis is on the cues present in music and speech that could allow musicians and interpreters respectively to speed up the rate at which they process what they are hearing, and thus improve their performance. The cues used in the two disciplines are compared using the Harvard method.

This thesis is an attempt to provide a theoretical framework on which to base further experimental research. The literature review regroups cues that may be used for anticipation in simultaneous interpreting and cues that may be used for anticipation in improvised ensemble playing. The subsequent practical analysis of two sample corpora shows that in both music and speech, the cues we identify are both interconnected and complementary. Furthermore, it shows that some cues may be more useful than others, and that the relative importance of the different anticipation cues is similar in both disciplines. The view that similar cues may be used in both tasks is thus substantiated.

Key words: Simultaneous interpreting, improvised ensemble playing, anticipation
# Table of Contents

I. Introduction .......................................................................................................................... 5

II. Definition of terms ............................................................................................................... 7
   1. Simultaneous interpreting ................................................................................................. 7
   2. Improvised ensemble playing .......................................................................................... 7
   3. Anticipation ....................................................................................................................... 8
      a. Anticipation in simultaneous interpreting ................................................................... 9
      b. Anticipation in musical ensemble playing ................................................................. 10

III. Grounds for comparison ................................................................................................... 12

IV. Point-by-point analysis ...................................................................................................... 14
   1. Anticipation based on extra-linguistic factors/musical context .................................... 14
      a. Introduction .................................................................................................................. 14
      b. Knowledge of participants .......................................................................................... 15
      c. Anticipation based on subject matter/musical genre ............................................... 18
      d. Anticipation based on prosody/dynamics .................................................................. 20
      e. Anticipation based on the use of visual clues ............................................................ 22
   2. Anticipation based on linguistic/melodic features ....................................................... 25
      a. Introduction .................................................................................................................. 25
      b. Anticipation based on linguistic and musical “collocations” .................................... 26
      c. Anticipation based on phrasal structure ..................................................................... 31
      d. Anticipation based on repetitions .............................................................................. 34

V. Practical discussion: Speech and sheet music analysis .................................................. 37
   1. Analysis of Obama’s victory speech .............................................................................. 37
      a. Analysis of anticipation based on extra-linguistic features ....................................... 37
      b. Analysis of anticipation based on linguistic features ............................................... 40
2. Analysis of Vivaldi’s Concerto in A minor, op. 3 No. 6 ......................................................... 46
   a. Analysis of anticipation based on musical context ................................................................. 46
   b. Analysis of anticipation based on melodic features............................................................... 51

VI. Conclusion .................................................................................................................................. 58

Appendix I ....................................................................................................................................... 60
Appendix II ....................................................................................................................................... 65
Bibliography ...................................................................................................................................... 78
I. Introduction

“Life is largely a matter of expectation.” (Horace). Our daily lives are shaped by our expectations. When we go to bed at night and set our alarm clock, we expect that it will go off in the morning at the time we have set it. When we go to the bike shed to take our bike to cycle to work or university, we expect that our bike will still be there and will not have been stolen in the night. We expect that our journeys will take a specific length of time. We expect that we will be hungry at lunch, and as we start to feel hungry, we expect that we will be able to buy something to eat. When what we are expecting does not occur, then we are surprised, sometimes frustrated, sometimes pleased. We often do not realise that we were expecting something until it doesn’t happen.

Expectations also play a major role in music and in language. These expectations will be the focus of this paper, which will compare anticipation in simultaneous interpreting and improvised musical ensemble playing.

Comparing simultaneous interpreting and improvised musical ensemble playing seems a logical step when the wealth of literature discussing similarities between music and language is considered. Researchers including Chomsky (1972), Meyer, L. B. (1994), Patel (1998, 2003, 2008, 2009), Koelsch et al (2005), Huron, D. (2006), Hengl, S. and Loiseau, N. (2007), Olivera Tovar-Espada, M. (2009) and Margulis, E. H. (2013) have all found links between the way in which the brain processes language and music. We wondered whether when one individual element of cognitive processing was considered, i.e. anticipation, concrete links could be established between the two disciplines. This would allow a more concrete link to be established, one which could later be proven through experimentation. The question that this thesis seeks to answer is therefore: are the cues used for anticipation similar in both simultaneous interpreting and in improvised musical ensemble playing?

Interpreting research is still in its infancy (in relative terms), and it is therefore logical to first establish a solid theoretical framework before launching into experiments. That is why this thesis provides a literature review which then provides
the basis for an analysis of two sample corpora: a speech by Barack Obama and a concerto by Vivaldi. Of course, neither the speech nor the concerto represents an ‘improvisation’. However, both follow standard patterns that could also be observed in a fully improvised speech or in improvised jazz music. Later experiments could use the analysis we provide as a framework for observation.

The literature analysis is written according to the Harvard comparison method. We compare and contrast A (simultaneous interpreting) and B (musical ensemble playing) within the framework of anticipation techniques. The thesis is therefore structured as follows: a framework of reference (anticipation) is defined and there follows a point-by-point analysis of similarities and differences. The framework of reference is provided in Chapter II. The point-by-point analysis in Chapter IV is divided into two sections, based on types of anticipation. The first section looks at anticipation based on context, and the second examines anticipation based on linguistic and melodic features. Chapter V shows how this theory can be applied to an example text and piece of music.

Although some research shows that greater anticipation may be required when interpreting in an asymmetric language combination, insufficient research in the area means that this has not been empirically proven (Van Besien, 1999). Furthermore, Van Besien defines anticipation as producing a constituent in the target language before it is uttered in the source language by the speaker (Ibid). Our thesis considers anticipation in a broader sense, as a cognitive process of expectation. Therefore we posit that anticipation is not language specific. This is also in line with research by Chernov (2004). In any case, this thesis is not concerned with production or output in either music or in simultaneous interpreting. Our interest is in the cues that the brain might use to aid anticipation when processing language and music, and we aim to start exploring this issue based on the idea that “much of what the simultaneous interpreter does is the same as we do all the time” (Henderson in Shlesinger 2000: 1).
II. Definition of terms

1. Simultaneous interpreting

Simultaneous interpretation is a discipline that was born during the Nuremberg trials in 1945. Much research in this field is interdisciplinary and is often being carried out within the framework of linguistics, cognitive science, neuropsychology and sociology (Gambier and Gile 1997). Many interpretation theorists and academics have also explored this field. For instance, Pöchhacker defines simultaneous interpreting as “the act of target text production in synchrony with the production and/or presentation of a source text” (1992: 215). Chachibaia, on the other hand, describes it as a “complex type of bilingual, meaning-oriented communicative verbal activity, performed under time constraints, with a strictly limited amount of information processed at an externally controlled pace” (2005: 101). We will focus on simultaneous interpreting when the speaker is improvising his/her speech and the interpreter has therefore not received the text of the presentation.

2. Improvised ensemble playing

We talk of improvised ensemble playing when two or more instruments or vocalists are playing or singing together without sheet music and without prior rehearsal of a particular piece. According to Wilson and MacDonald, group improvisation in music “involves the creation of music as it is being played through the idiosyncratic contributions of two or more individuals, each interpreting and musically responding to the playing of the other(s). Any individual musical contribution is impromptu and is tailored to the sounds, rhythms and tonalities heard from accompanying musicians” (2012: 559). Jazz is the most renowned genre of improvised music-playing in a group. However, our research aims to include all types of improvised ensemble playing, as we will be analysing genre as a specific cue for anticipation in due course.
3. Anticipation

Anticipation occurs in all aspects of life. It can be described as a form of imaginative speculation and is essential to the human process of problem-solving. According to Riegler, “human beings feature a system of innate forms of ideation which allows the anticipation of space, time, comparability, causality, finality, and a form of subjective probability or propensity” (2001: 1). Anticipation allows the formulation of an array of possible responses more quickly. Hommel explains that “planning an action turns the cognitive system into a kind of reflex machinery, which facilitates the proper execution of the plan under appropriate circumstances” (2006: 2). Anticipation is therefore a “goal-oriented behaviour” (Pezzulo et al. 2008: 43).

Huron devised the ITPRA (Imagination – Tension – Prediction – Reaction – Appraisal) model of anticipation that can be applied to any type of expectation (2006: 16).

Figure 1: ITPRA model of anticipation

In the first state, Imagination, different outcomes are imagined. Then, the event approaches, often creating a feeling of Tension. Subsequently, feelings are provoked depending on whether or not Predictions are borne out. At the same time, a Reaction
takes place based on a rapid evaluation of the situation. Finally, the initial reaction is Appraised.

a. Anticipation in simultaneous interpreting

Most interpretation theorists agree that anticipation plays an important role in simultaneous interpreting. According to Chernov, it is “the psychological machinery of probability prediction [that] entails some kind of correlation between the probability of certain linguistic (phonetic, prosodic, verbal and syntactic) or semantic (meaning and sense) developments in the utterance and coherent discourse at the stage of perception (communication between the speaker and the interpreter), and the anticipatory synthesis of the TL (target language message)” (1994: 145).

Most authors differentiate between “two different types [of anticipation]: a) linguistic or syntactic anticipation and b) extra-linguistic anticipation”, (Setton 1999: 191). However, observing and measuring this anticipation is a complex undertaking. Some agree that anticipation can be observed by transcribing interpreter and speaker output and identifying instances where the interpreter has uttered words or units of meaning before the speaker. Setton, for instance explains that “simultaneous interpreters often produce a sentence constituent – a main verb, for example – before any equivalent constituent has appeared in the SL input” (Ibid 1999: 191) and defines this process as anticipation which, according to her, “follows from capturing the sens”. Lederer also attempts to measure anticipation but concludes by pointing out that whilst cases of “observable” anticipation exist, experience suggests that anticipation takes place much more frequently than can be illustrated by this type of transcription (1981). Chernov defines anticipation in a broad sense as a complex system of predictions based on “the principle of anticipatory reflection of reality” (2004: 91).

Although identifying the position of corresponding constituents in source and target text is a straightforward way to identify occurrences of anticipation, we believe that this type of observation may overlook some instances where anticipation has occurred. Because our research is not language-specific, and because a wealth of research into anticipation and expectation models exists, we have decided instead to
produce an analysis of the different cues that might be used by simultaneous interpreters to formulate predictions about the content of the message to be transmitted. We will not, therefore, detail instances in which simultaneous interpreters finish a sentence before the speaker. Instead, our focus will be on analysing different cues that allow them to formulate expectations that are most likely to be confirmed as the speaker advances in his speech. Lederer calls this type of anticipation “freewheeling anticipation” (1981: 253). The interpreter anticipates what the speaker is going to say, and then checks this against what the speaker does say, allowing interpretation to follow with a very short delay. As Setton puts it, interpreters “use deduction and inference from combined text and non-text information, including the logical structure of long segments of the discourse. The additional extra-textual sources provide them with a basis for making temporary approximations and generalisations about these entities, properties and relations while the sentences in which they occur are still incomplete” (1999: 191).

This thesis is based on the assumption that the same cues that are used by all listeners to predict future events are also used by simultaneous interpreters. The thesis does not seek to examine whether interpreters are more skilled than average listeners at picking up on cues which could allow predictions to be made. The focus is on identifying cues in speech that can be used for the formulation of expectations. Therefore, in the practical discussion (section V), the focus is on the cues present. The extent to which different interpreters or listeners would base their anticipation on these cues is not discussed. Indeed, it should also be remembered that anticipation may be conscious or unconscious, and so interpreters or listeners themselves may not be aware of which cues they are using or the extent to which they are using them. The aim is simply to present the cues which may be used.

b. Anticipation in musical ensemble playing

Literature on anticipation in musical ensemble playing is less readily available than literature on anticipation in interpreting. Indeed, according to Wilson and McDonald, “this musical practice is a unique psychological phenomenon that has not received the thorough investigation it merits” (2012: 559). However, many psychologists and theorists have written about listeners’ expectations with regard to
music. Our research will therefore be based on expectations listeners formulate when listening to music in general, as a great deal of research exists in this area. Our contention is that musicians who simultaneously listen, formulate expectations and play are listening and expecting in the same way as a musician who is simply listening to music. We will therefore detail the cues that musicians might use to anticipate in all settings. Tillman indicates the premise upon which these expectations can be based and the types of musical event can be anticipated:

“When presented with a musical context (i.e. the beginning of a melody), listeners develop expectations about future events – what kind of event (tone, chord, timbre) is the most probable to occur next and at what time in point. These musical expectations can be linked to sensory features (or surface features), such as dynamic and timbral characteristics, melodic contour and intervals, but also to the repetition of specific notes, note groups or motifs. They can be further linked to the tonal structures of the musical system and thus require listeners’ tonal knowledge” (2007: 14).

The cues described by Tillman are the cues we have chosen to analyse alongside the cues used by interpreters. We will apply the results of our research into music listeners’ expectations to improvised ensemble playing because the musician, in such a situation, is also a listener, as is the interpreter in a simultaneous interpretation context. In the practical discussion (section V), the focus is on identifying the cues that could be used by a musician to form expectations. Like a simultaneous interpreter, a musician is trained and has learned to form these expectations. However, this thesis in no way posits that the brains of interpreters and musicians operate differently to the brains of what we may call naive comprehenders. The idea is simply that interpreters and musicians may have learned to make more use of these cues in formulating expectations because they are required to carry out the tasks of listening and production simultaneously and it is thus to their benefit to anticipate more than average. However, we do not posit that only a musician or an interpreter would be able to understand the cues discussed.
III. Grounds for comparison

It seems natural to compare cognitive processing of music and of language. It has been claimed that both are unique to humans (Federenko et al., 2009), and both are universal: generally, human beings are born with the capacity to process language and music. Furthermore, both music and language consist of acoustic patterns that are structured to convey meaning and emotion (Patel, 2008). The research world is taking an increasing interest in the links between music and language. Within the Faculté de Traduction et d’Interprétation itself, research is on-going into the similarities in the ways in which interpreters and musicians multitask. However, conflicting research also exists, suggesting that music and language are processed separately by the brain. Peretz (2002) argues that some processes in music, for instance encoding the different pitches in musical scales, are carried out by specialised parts of the brain. She points out cases in which individuals who have suffered cerebral trauma subsequently maintain good cognitive functioning in one sphere but not in the other.

It is clear that differences between language and music exist. This naturally entails differences in the way the two phenomena are processed. Just as it is difficult to find an equivalent to a musical scale in language, it is difficult to find an equivalent for a grammatical concept in music. Nonetheless, we still believe that similar systems are used to process both language and music. This is supported by research into a shared structural system in language and music (Federenko et al., 2009, Patel 2008). As researchers into simultaneous interpreting, we might find it of interest to consider whether simultaneous interpreters might be processing language in the same way that musicians process music. We have decided to examine whether this might be substantiated, based on one aspect of cognitive processing, anticipation, which is essential in both simultaneous interpreting (Moser, 1978, Seleskovitch, 1984, Chernov 1994) and the appreciation of music, and thus musical ensemble playing (Huron, 2006).

We are comparing anticipation in simultaneous interpreting and musical ensemble playing because in both cases, it is necessary to listen to and produce sound at the same time. However, the focus of our research is on the cues used for anticipation in
both activities, and we do not seek to examine whether or not musicians and interpreters anticipate these cues differently from naive comprehenders.
IV. Point-by-point analysis

1. Anticipation based on extra-linguistic factors/musical context

a. Introduction

One may imagine that in a simultaneous interpreting setting, the message being transmitted is a purely linguistic construct, e.g. the words that are uttered. However, many other factors and features of a communicative event are key in creating a message that is “whole” and that can be fully understood. According to Nord (1991), the recipient of a message must possess a solid knowledge of its extra-linguistic features to understand its full meaning. These features can include participants (be they senders or receivers) and these participants’ knowledge and representation of the world, their horizons, and their expectations based on situational factors, such as medium, place, time and occasion. Schweda Nicholson (1987) points out that interpreters use these extra-linguistic cues to understand the message. These types of situational and cultural considerations also apply to any musical performance. According to Nijs, Lesaffre and Leman, “music performance entails a series of perceptually guided actions that are embedded in a whole of specific physical and cultural elements such as cultural and musical traditions, the specific configuration of the performance situation and personal characteristics of the musician” (2012: 3). Focusing on the role of cultural-specific elements in anticipation, Huron also points out that “culture provides the preeminent environment in which many expectations are acquired and applied” and that “in the case of music, [...] the context for predicting future sounds is dominated by cultural norms” (2006: 3).

We therefore posit that contextual and cultural-specific elements are considered by interpreters and musicians alike during the anticipation process. Indeed, as Nijs, Lesaffre and Leman point out, “these elements give rise to the constraints and possibilities of the musical environment that is created during the performance” (2012: 3). This means that musicians will draw on these to predict patterns while improvising. In conference interpreting, meanwhile, using contextual and cultural-specific features
allows the interpreter to form more accurate predictions about the linguistic and other non-linguistic features likely to come (Schweda Nicholson 1987, Seleskovitch 1976).

We have therefore chosen to compare the use of such cues in anticipation processes in simultaneous interpreting and improvised ensemble playing, drawing a parallel between knowledge of the participants in a musical and a conference setting. In a musical performance, this includes the other musicians and the audience, while for the simultaneous interpreter, other participants include the speakers and the audience. We will then go on to analyse the role of expectation based on musical genre and conference subject matter. This will be followed by a comparative analysis of prosody in language and dynamics in music, and an analysis of how visual cues help the anticipation process in both settings.

The reasons behind our choices of elements to be compared in each section will be explained, and examples will be given in each case.

b. Knowledge of participants

Pragmatics tells us that in order to understand an utterance, we must also understand its situational context (Lakoff 1972, Schweda Nicolson 1987). We posit that successful formulation of expectations is also dependent on a solid understanding of the situational context. Both the speaker and the audience account for part of this context in simultaneous interpreting. The same is true in musical ensemble playing where the music represents an opportunity for musicians to express themselves to an audience. It is therefore important that both the interpreter and the musician know who the other participants in the communicative setting are. We suggest that this understanding forms a basis for the formulation of accurate predictions.

Dewey (2005) claims that all music is conceived to be played or sung to an audience, including compositions which are never played aloud, as even they are conceived with a product in mind that would be perceptible. Logically, we could therefore suppose that musicians playing in an ensemble may be able to formulate...
expectations about how the others will play based on the atmosphere or rapport created between the musicians and the audience.

The musicians’ group dynamic is also essential in improvised ensemble playing. As Davidson and Good (2002) point out, it is possible for musicians to increase their range of improvisations as they get to know and understand the other individuals with whom they are playing. They emphasise that interpersonal skills are central to producing a homogenous musical performance. This view is also supported by Berliner (1994) who says that when musicians improvise collectively, they base their improvisation on specific social interactions, power relations and tendencies to compromise, as well as on their musical tastes and skills. This understanding is referred to by Berliner as “striking a groove” (Ibid 1994: 430). In practice, in a jazz ensemble, this groove is often based on the interaction between the walking base and the cymbals, which should be perfectly synchronised. One musician described the synchronisation between the two as being like “a kind of emotional empathy [...] The relationship is very intimate” (Ibid 1994: 350). It is this empathy or understanding that allows the musicians to “feel” or, to be more precise, to anticipate, when the next beat should fall and what the other player is likely to do next, so that both can get into the groove.

Similarly, in interpreting, it is important to understand other people. In a general sense, listeners use their knowledge of a speaker as soon as they try to understand what that speaker is saying (Berkum et al. 2008). This knowledge of the speaker also allows predictions to be made (Chernov 1994). An understanding of the speakers in a conference will, for example, allow the interpreter to make predictions about what these speakers will say. This might be based on what the speaker’s point of view will likely be. For example, in a meeting of women trade unionists, the interpreter may well predict that the women will take a left-wing approach to the issues discussed and that they will have an interest in promoting female participation in the trade union movement. If the interpreter has previously worked for a meeting at which the same participants are present, the interpreter may well be able to form even more accurate predictions about the women’s attitudes based on their past remarks and speeches at preceding events. But it is not just the women’s attitudes that the interpreter may predict. It is also possible to predict the style that a speaker will adopt, based on their past speaking
behaviour. Different styles are specific to different speakers of a language (Coupland 2007). It is common for couples or friends to finish each other's sentences because of their knowledge of one another and thus their ability to predict what the other will say. In the same way, an interpreter working regularly for a certain client may well become similarly accustomed to that person's way of thinking and speaking, allowing them to predict with great accuracy what the individual will say before the words are actually uttered. Chernov makes this point very clearly when he says:

“If the speaker is known to the interpreter, as the speech begins, the interpreter forms a general outline of a probability prognosis of the meaning and sense structure of the forthcoming message, supported by some knowledge of other factors of the situational context” (1994: 148).

Staum (2008) also highlights the importance of knowledge of the speaker in considering the plausibility of an utterance. Although he does not specifically refer to anticipation, we can infer that knowledge of the speaker is thus also valuable in anticipating possible continuations of an utterance.

Depending on the audience, the speaker may also modify their form of address. Nord points out that, “the style of a text refers to the way the information is presented to the receiver” (1991: 92). The politeness register may change, for example, depending on the relative status of speaker and audience (Lakoff 1972). Knowing the audience will thus allow the interpreter to formulate expectations about the style and content of a speaker's discourse.

Of course, there are also differences between the way in which knowledge or understanding of others influences anticipation in ensemble playing and simultaneous interpreting respectively. In musical ensemble playing, all players attempt (perhaps to a greater or lesser extents) to understand and empathise with one another, and above all to compromise. In interpreting, meanwhile, it is the sole responsibility of the interpreter to empathise or understand the speaker, and not conversely. Berliner (1994) describes an incident when a lack of compromise between players led to an on-stage fight between a saxophonist who was improvising in an unorthodox manner, and a more conservative
bass player. After refusing to compromise on their style of music, both musicians threw their instruments aside and engaged in a physical fight. In interpreting, the roles are more clearly defined from the outset: the interpreter defers to the speaker, and no matter where the speaker is heading, the interpreter must follow whilst anticipating where the speaker is likely to go.

c. **Anticipation based on subject matter/musical genre**

Anticipation in both simultaneous interpreting and musical ensemble playing may also be based on subject matter considerations. By subject matter in interpreting, we mean the subject or topic of a conference or meeting. We will draw a parallel here between subject matter in interpreting and a musical genre or style.

Research has shown that a good understanding of subject matter can allow interpreters to make accurate predictions. Moser (1978) points out that when interpreters are knowledgeable about a certain subject matter in a conference, this speeds up their information processing, giving them more time to focus on new incoming information. An experiment by Greenberg and Larkin (1968) shows that when listeners expect to hear a signal at a certain pitch, they are better able to detect a tone at that pitch against a background of continuous wide-band noise, as opposed to a tone that varies from the original pitch by more than 150Hz. In other words, listeners’ expectations can even influence what they are able to hear. This is also true in interpreting, and Moser (1978) points out that preceding context understanding aids subsequent word identification. This is also backed up by psycholinguistic research on reaction times to semantically expected and semantically unexpected words (Patel 2008). This is known as semantic priming. Moser emphasises that where the interpreter is able to predict, processing capacity is saved and more attention can be devoted to processing the incoming source language message. Seleskovitch wrote that “Ce que l’on perçoit est fonction de ce que l’on sait” (1976: 74).

Seleskovitch describes knowledge about a certain subject matter as “bagage cognitif pré-existant” (1984: 273 – 274). This means that given any phrase, an interpreter will associate it with previous knowledge. To use a current example,
Wednesday 17 April 2013 was the day of Margaret Thatcher's funeral. It would be entirely feasible for someone in the UK, in the days leading up to the funeral, to complete the phrase “Margaret Thatcher's funeral is to take place on Wednesday” before it reaches its conclusion. Of course, this is also due to language-internal factors, but certainly by the “Margaret Thatcher’s funeral is to take place on...", it is knowledge of the subject matter that would allow someone familiar with the topic to anticipate that the sentence will end with “Wednesday”. According to Seleskovitch, this subject matter understanding allows an “anticipation du sens”, which can then be joined with an “anticipation verbale”, more of which later.

When anticipating the continuation of musical sequences, evidence has been found suggesting that bagage cognitif pré-existant has a role to play. Musicians also build up stocks of musical knowledge about particular styles, and this knowledge helps them to anticipate the next turn that the music will take. According to Meyer:

“Style constitutes the universe of discourse within which musical meanings arise” (1994: 7).

Once a musician has learned a style of music, it is associated with a system of subjective probabilities, and these allow the musician to form expectations about the continuation of the piece (Ibid).

An experiment by von Hippel, Huron, and Harnish also shows that familiarity with a musical genre allows more accurate predictions to be made (Huron 2006). In the experiment, American and Balinese listeners were asked to bet on probabilities for the continuation of a Balinese melody. Given their cultural familiarity, Balinese musicians were much better at forming expectations about the continuation of the melody, and by the end of the experiment they had amassed greater ‘fortunes’ than their American counterparts (the bets were not made in real money). In the betting paradigm musicians could place their chips on more than one option each time, and this allowed the level of certainty of the musicians to be measured. Balinese musicians also showed less uncertainty than their American counterparts.
However, this experiment served to show that American listeners were still able to form accurate predictions about the Balinese melody. This illustrates that prediction is not based on musical genre alone. As in interpreting, it is but one part of a system of prediction. Indeed as Chernov (1994) points out, interpreters may formulate predictions in a top-down or bottom-up way. Where the interpreter has a good knowledge of the speaker and the situation, he or she will formulate their initial expectations based on this, thus using what Chernov calls a top-to-bottom prognosis. If, on the other hand, the interpreter has little or no knowledge of the speaker or situational context, he or she will have to rely first on sounds and semantics to formulate initial predictions, thus taking a bottom-to-top approach.

Furthermore, the American musicians’ predictions improved in terms of both certainty and accuracy as the music progressed, showing that they were able to adjust their expectations as they became more familiar with a different style of music. A parallel can be drawn here with an interpreter’s improved anticipation as a conference progresses. Lederer (1978) points to the fact that as they spend longer in a meeting, interpreters are able gain a deeper understanding of what a speaker means, having increased their store of knowledge of the meeting in question. We would also suggest that knowledge of the speaker(s) increases. This allows them to move away from the original and focus on meaning, rather than on individual words. And of course, capturing the ‘sens’ necessarily involves some element of prediction (Ibid).

d. Anticipation based on prosody/dynamics

According to Ahrens, prosody is used “to structure the acoustic continuum” and emphasise “those parts of the spoken text that the speaker considers important” (2005: 1). Prosody covers a number of facets, including intensity (Seeber 2001). Dynamics are defined as the varying levels of loudness or intensity in music. It can be said that both prosody and dynamics are used to highlight specific parts in a speech or a musical performance, in order to produce an effect on the listener. This effect can create tension and contrast. For instance, Huron (2006) explains that an element of surprise can be created by violating dynamics expectations in a musical performance if an isolated fortissimo chord is played during slow, quiet music. In both simultaneous interpreting
and musical ensemble playing, prosody and dynamics respectively provide the interpreter and the musician with information that can be used in a similar way to formulate expectations. It is worth pointing out that Lim goes as far as using the term “musical prosody” (2012: 67) to describe dynamics. It is not unreasonable, then, to compare anticipation based on dynamics in music and anticipation based on prosody in simultaneous interpreting.

As Ahrens points out, prosody is “an indicator of the mental-cognitive processes underlying speech production” (2005: 1), and the same can be said of improvised music ensemble playing. For instance, in a conference interpreting context, if speakers lower the tone of their voice, they may be hesitant as to how to continue their sentence, or trying to avoid saying something that they do not wish to make explicit. In the same way, in an improvised musical ensemble playing context, if a musician suddenly or progressively starts playing more quietly (piano), this could be interpreted as indicating a lack of self-confidence, and possibly a fear of dissonance. In both cases, a lower volume indicates a state of uncertainty and a desire to minimise the possible adverse effects of what will be said/played. When this is applied to the anticipation process, the interpreter and the other musicians will be more vigilant, and will be more likely to slow down their own performance, as they will predict that an unexpected outcome of the phrase/sentence is more likely. They might also be more likely to expect a change to the phrase/sentence that was started or even to expect that the phrase/sentence be started again.

According to Patel et al., intonation, which is part of prosody, “contributes to marking the boundaries of structural units” (1998: 144). In other words, and as Ahrens points out, “intonation is used to indicate that the speaker will go on speaking or that further elements will follow” (2005: 1). Indeed, as Huron (2006) indicates, research shows that it is possible for people to accurately predict the end point of an utterance, even when they do not understand the speaker's language. The case is similar for musical dynamics. In music, according to Lim, “patterns of musical dynamics such as loud, soft, and gradual increases and decreases of volume contribute to the emotional content of music” (2012: 67). For instance, an educated listener will know that a crescendo, defined as a gradual increase in dynamics, is often likely to be followed by a
diminuendo, or gradual decrease in dynamics. This was explained by Gabrielsson, who indicated that “each phrase shows an increase toward a maximum at, or close to, the transition from the next to the last measure and then falls steeply. The termination of each phrase is thus associated with diminishing amplitude” (1987: 98). A musician will thus be able to predict that, if a fellow musician has just started a crescendo, the musical phrase is unlikely to end abruptly. Instead, it is likely that a maximum volume will be reached and that this will be followed by a diminuendo. In parallel, in a simultaneous interpretation context, if the speaker’s voice goes up or increases in volume at the end of a unité de sens, the interpreter will be able to anticipate that another unité de sens will very likely follow. If the volume decreases, it is probable that the speaker has reached a conclusive unité de sens.

Prosody and dynamics also serve the essential function of transmitting emotions to the listener, another vector of meaning. According to Seeber, “the melody of a sentence [...] defines sentence meaning” and makes it possible to “distinguish questions from statements, to convey attitudes such as warnings, boredom, surprise, neutrality as well as other emotions” (2001: 69). This rhetorical strategy using prosody has a direct equivalent in music, as, according to Lim, “music dynamics parallel human dynamics in terms of moods, levels of excitability and, physical and psychological states” (2012: 67).

Such tools are used by the listener on a superficial level, but can be utilised by musicians and interpreters alike. They can draw on the general mood being transmitted to anticipate the content of the message to come. For instance, if, in a conference setting, a speaker’s voice continuously grows louder and more enthusiastic, the simultaneous interpreter can legitimately assume the speaker will be using more emotionally-connoted language, and is most likely building momentum towards a conclusion that is meant to have as great an impact as possible.

e. Anticipation based on the use of visual clues

Non-verbal elements, such as eye movements, hand gestures, facial expressions and body posture are an integral part of communication. During a communication event, the speaker will, whether deliberately or not, enrich the message with this type of non-
verbal element. Stating the obvious, musicians will be moving during the performance. Some gestures are part of instrument playing, whereas some others are deliberately added to communicate with other musicians, especially in an improvised ensemble playing. We can thus posit that that musicians and interpreters use those signals in a similar way to anticipate the content of the message that is being verbally/melodically communicated. Indeed, according to Besson et al., “thanks to the interpreters’ unconscious or conscious knowledge of […] non-verbal elements, they are able to predict what exactly is going to be said, or are able to detect the meaning in an early stage of the discourse. Thus, predictability of meaning in the field of interpretation is […] a result of [their] ability to interpret non-verbal communication” (2005). During an improvised musical performance, according to Davidson, “owing to the interactive movement activity, […] bodily movements can be of a communicative nature for co-performers” (2012: 624). This allows musicians to anticipate the next course of action that their fellow musicians will take, as it offers “an insight into the articulation of musical structures as well as the narrative of an underlying meaning of the work” (Davidson 2012: 624).

Ekman and Friesen (1969) have devised a classification system of kinesics, or body language, with five different types of movements according to their communicative functions. For instance regulators regulate interaction such as turn-taking (Ginsborg & King 2009). As such, in a conference setting, regulators such as the speaker nodding his/her head in the direction of a member of the audience and making eye contact with them will allow the interpreter to anticipate with a certain level of accuracy that the speaker is about to give the floor to this member of the audience, or ask a question. In a similar way, the interpreter should be able to anticipate the end of a speaker’s intervention. Before concluding, the speaker’s eyes may scan well around the room. This is generally a sign that the speaker is relaxing and making sure his message has had the intended effect. In an improvised musical performance setting, such regulators will also be used by musicians to anticipate the coming actions of the other members in their group. For instance, some gestures, such as standing up straight or lifting an instrument, will be interpreted as marking the beginning of a phrase, the end of a pause, or the end of the piece. Deliberately marked breathing is also a commonly used starting gesture. The musician, seeing a fellow performer breathing in deeply, would be able to anticipate
the beginning of a new phrase at the moment that their fellow performer starts breathing out.

According to Ekman and Friesen’s classification (1969: 71), affect displays spontaneously express emotions such as anger, fear and surprise. These displays may be linked to a specific culture, but some affect displays are pan-cultural. Interpreters and musicians alike will thus to be able to use this type of visual clue to predict the direction that the speaker/performer is more likely to take. The interpreter could make use of affect displays to predict what the speaker’s feelings about a certain topic are. These feelings might subsequently be made explicit. The musician, meanwhile, could use this type of display to anticipate a difficult section. It may be possible, for instance, to read the concentration in another performer’s body language before the more difficult section commences.

It is also worth mentioning that visual clues at the level of the sound-producing gestures play an active role in the anticipation process. As Skipper, Nussbaum and Small point out, “language comprehension, in the context of the mouth and face movements involved in speech production, activates a network of brain regions involved in audio-visual-motor integration and speech production” (2005: 86) which, in other words, means that the listener recognises and mentally recreates the movements used by the speaker to produce the speech. This empathy with the speaker allows the interpreter to better understand the message, and thus better anticipate what the speaker is going to say. Similarly, in a musical ensemble playing context, a musician, as long as he has a good command of the other musician’s instrument, will be able to anticipate to a certain extent which sound the other musician intends to produce as he sees the gesture leading to hitting a specific key, inhaling before breathing into a wind instrument, or a repositioning of the fingers on a fret board.
2. Anticipation based on linguistic/melodic features

a. Introduction

As we have seen, context is central in allowing both musicians and interpreters to formulate expectations about the continuation of a given text or piece. However, it is also important to realise that a great deal of anticipation is based on linguistic (Chernov 2004) and melodic (Huron 2006) features. In order to make sense, music, like language, follows a set of rules and principles. Those principles are then deliberately applied or flouted by musicians and speakers. Sound knowledge of the rules governing their respective fields allows musicians and interpreters to predict with accuracy the elements which are to come. Indeed, Patel, from his research in Lerdahl & Jackendoff (1983), Sloboda (1985) and Swain (1997), comes to the following conclusion:

“The perception of both speech and music depends on the rapid processing of signals rich in acoustic detail and structural organisation. For both domains, the mind converts a dynamic stream of sound into a system of discrete units that have hierarchical structure and rules or norms of combination. That is, both language and music have syntax” (Patel 1998: 1).

Huron (2006) points out that in general terms, probabilities in music can be classed as follows: those pertaining to a specific piece of music, those which belong to a certain style or genre, and those which exist in music as a whole. Similarly, with regard to anticipation in interpreting, Seleskovitch and Lederer classed anticipation in two categories: “anticipation de sens” (based on the meaning of a particular discourse) and “anticipation verbale” (based on linguistic knowledge) (Seleskovitch 1984: 277).

It is the probabilities that reflect music and language as a whole, or “anticipation verbale”, that we are going to discuss in this chapter. We will not deal with the issue of whether or not these expectations are innate or learned, in other words we will not be discussing the notion of universal grammar (Chomsky 1972) and its relevance to the formulation of expectations. Instead we will base our analysis on concrete comparisons between cues that we consider to be similar in both musical improvisation and
simultaneous interpreting. We will draw a parallel between anticipation based on collocations in simultaneous interpreting, and based on chords and cadences and common note sequences in musical improvisation. We will then move on to discuss the role of syntactic structure and key/time signature in the formulation of expectations in simultaneous interpreting and musical improvisation respectively. This will be followed by an analysis of stylistic features that facilitate anticipation in both disciplines.

In all of these areas we will see that our minds appear to obey certain general laws when processing stimuli. However, it will also become clear that extralinguistic and linguistic factors cannot be completely dissociated. Expectations based on linguistic features are also related to their context (for example the type of discourse), although of course there are some linguistic universals across all human languages (Patel 1998). The same is true in music, where it is impossible to ignore the style or period in which the music was written.

b. Anticipation based on linguistic and musical “collocations”

“Why do builders not produce a building or authors not invent a novel, since they do invent stories and plots? No reason as far as dictionary definitions of words are concerned. We don’t say it because we don’t say it.” (Bolinger and Sears 1981: 55)

Look up any word in a dictionary, and you will find a list of the words with which it collocates. But what does the term “collocation” actually mean? The etymological root of the world “collocation” is in the Latin word “collocare”, which means “to place together”. Its first recorded use to refer to a particular combination of words was in Southey’s The Doctor (1834 – 47). However, its use as a technical term in linguistics was formalised when Firth (1957) and Halliday (1961) developed the idea of collocations in post-WW2 publications. Baker (1992) provides a good working definition of collocates as a range of items that are compatible to a greater or lesser degree with a word in question. This is illustrated in the quotation above, where it is clear that “invent” is a verb which is less compatible with the noun “novel” than “write”. There are different

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1 Chamber’s Dictionary of Etymology
forms of collocation, including adverb + adjective, adjective + noun, noun + verb or verb + adverb.

These collocational restrictions aid the interpreter in the anticipation process. This point is illustrated by Seleskovitch. She gives the example of the following phrase, taken from a French newspaper:


To native French speakers, and those very familiar with the language, the word “efforts” is very easy to anticipate, because there are very few other words which would collocate with “déployé d’innombrables...”. She thus points out that:

“On appréhende le contenu sémantique de mots non encore prononcés mais annoncés par d’autres mots que l’on a l’habitude de lire ou d’entendre ensemble” (Ibid : 276).

It is therefore clear that linguistic anticipation happens, based on collocations which are known to the interpreter.

As interpreters use collocations, or principles of lexical cohesion, to formulate expectations with regard to the continuation of a unit of meaning or sentence, so too can musicians base predictions about the progression of a piece of music on knowledge of common sequences of chords, cadences and individual tones.

“Both adult and infant listeners build some sort of mental representation of the transitional probabilities between adjacent tones in a tone stream, grouping together tones with high transitional probabilities, and forming group boundaries at locations in the tone stream where transitional probabilities are low” (Huron 2006: 71).

What do we mean by chords and cadences? Chords are a group of two or more notes played simultaneously on an instrument. Often they follow a regular pattern throughout a piece of music, for example the tonic chord is normally repeated several times throughout the piece. A cadence is the chord progression at the end of a piece, or
at the end of a phrase. As Huron explains, the probability of a certain chord sequence at the end of a phrase or piece accounts for the classification of cadences as being, for example, “perfect” (sense of completion, as this is the most common cadence at the end of a piece in the common practice tonal system\(^2\)), or “interrupted” (giving a sense of surprise as the listener expects a perfect cadence but it does not follow.) In a cadence, it is not just the final chord that is predictable. Musical theorists have already noted that the chords in cadences are organised in predictable ways (Christensen 2002). Depending on the likelihood of a specific cadence, a specific effect can be achieved. As Huron puts it:

“The probability of a tone in a closural position accounts for the phenomenal experience of completion, arrival and resolution on the one hand, and unfinished, hanging and transitory on the other. The subjective experience of tending or leading can be predicted on the basis of first-order probabilities evident in actual music” (Huron 2006:173).

Of course, cadences cannot be seen as collocations completely isolated from the style of music, just as some words will be more likely to be associated with one collocate rather than another depending on the context. Indeed, according to Baker, “individual lexical items have little more than a ‘potential’ for meaning outside text and their meanings are realized and can be considerably modified through association with other lexical items in a particular textual environment. And yet, the potential for meaning which a given lexical item has is not totally unrestricted” (1992: 206). Similarly, different cadences are common in different types of music, and some experiments have found that it is familiarity with different musical styles that contributes most to a listener feeling a sense of closure thanks to a given cadence (Huron 2006). However, taking into account the style, predictions can be made about the next chord that we will hear based on cadential probabilities. Meyer provides the following example in musical notation, showing us where the tonic chord would be expected in Western music of the 18th century (1961: 25):

Piston and DeVoto even created a table of the usual root progressions that could be expected on hearing a particular chord (1987: 21). This is based on observations of root progressions in music. Of course, roots and chords are not the same, but the authors themselves point out that “chord progression can be reduced to root succession” (1987:20). Certainly the root position is the most common one for chords (e.g. do, mi, sol rather than mi, sol, do). Since musicians must hear common chord progressions more frequently, we could posit that each time they hear a chord they will subconsciously be expecting the most common progression to follow. This table is useful, but it should nonetheless be noted that expectations are formulated based on general chord progressions, and not just based on the chord that has just been played.

Table 1: Table of usual root progressions from Piston & DeVoto [21]

<table>
<thead>
<tr>
<th>Chord</th>
<th>Is followed by</th>
<th>Sometimes by</th>
<th>Less often by</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>IV or V</td>
<td>VI</td>
<td>II or III</td>
</tr>
<tr>
<td>II</td>
<td>V</td>
<td>IV or VI</td>
<td>I or III</td>
</tr>
<tr>
<td>III</td>
<td>VI</td>
<td>IV</td>
<td>I, II or V</td>
</tr>
<tr>
<td>IV</td>
<td>V</td>
<td>I or II</td>
<td>III or VI</td>
</tr>
<tr>
<td>V</td>
<td>I</td>
<td>VI or IV</td>
<td>III or II</td>
</tr>
<tr>
<td>VI</td>
<td>II or V</td>
<td>III or IV</td>
<td>I</td>
</tr>
<tr>
<td>VII</td>
<td>III</td>
<td>I</td>
<td>-</td>
</tr>
</tbody>
</table>
Similarly, Peacock (2011) provides a table of the top four high-frequency collocates for nouns extracted from a corpus of 320 research articles across eight different disciplines.

Table 2: Top four high-frequency collocates for nouns

<table>
<thead>
<tr>
<th>Noun</th>
<th>Collocations</th>
<th>Percent of all occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>study/ies</td>
<td>present -, previous -, case -, results (of) -</td>
<td>19</td>
</tr>
<tr>
<td>Result/s</td>
<td>-show/ed, - indicate/d, - suggest/ed, - obtained</td>
<td>14</td>
</tr>
<tr>
<td>Effect/s</td>
<td>Significant -, main -, no -, positive -</td>
<td>24</td>
</tr>
<tr>
<td>Model/s</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Information</td>
<td>- management, - system/s, - technology, - processing</td>
<td>12</td>
</tr>
<tr>
<td>Data</td>
<td>- (were) collected, - collection, - analysis, - were obtained</td>
<td>10</td>
</tr>
<tr>
<td>Analysis/es</td>
<td>Factor -, regression -, - was/were performed, - revealed</td>
<td>11</td>
</tr>
<tr>
<td>Process/es</td>
<td>Business -, learning -, information -, planning -</td>
<td>9</td>
</tr>
<tr>
<td>Research</td>
<td>Previous -, future -, further -, -has shown</td>
<td>17</td>
</tr>
<tr>
<td>Sample/s</td>
<td>- period, - size</td>
<td>6</td>
</tr>
<tr>
<td>Experiment/s</td>
<td>Results (of/in) - (1, 2, 3), present -, participated in -, previous -</td>
<td>8</td>
</tr>
<tr>
<td>Relationship/s</td>
<td>- between, customer -, positive -, causal -</td>
<td>38</td>
</tr>
<tr>
<td>Factor/s</td>
<td>- analysis/es (1st, 2nd, 3rd, higher-) order -, - structure, key -</td>
<td>14</td>
</tr>
<tr>
<td>Variable/s</td>
<td>Dependent -, dummy -, independent -, explanatory -</td>
<td>29</td>
</tr>
<tr>
<td>Method/s</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Evidence</td>
<td>Provide/d/ing -, find/found -, empirical -, there is/was no -</td>
<td>27</td>
</tr>
</tbody>
</table>
At any rate, it would appear that chords, like words, create a sense of expectation in the listener based on the other chords with which they are commonly associated, or with which they collocate. In both improvised music and in simultaneous interpreting, these probabilities can be used by musicians and interpreters respectively to formulate expectations about the progression of a speech or of a piece of music.

As well as anticipating chords and cadences, it is also possible for musicians to predict specific notes in a melody. For example, according to Huron, a melody tends to start with one of the pitches of the tonic triad (do, mi or sol). This means that when listeners hear an isolated pitch, they are more likely to assume that this note is do, as opposed to fa for example. What is also interesting, based on this finding, and as Huron (2006) points out, is that even when there is a minute amount of information available, the natural reaction is to form conclusions based on expectations, which are in turn based on experience. The next section will explain how musicians can, in addition, base their expectations about subsequent notes of a melody based on their experience of phrase contours.

c. Anticipation based on phrasal structure

Interpreters also anticipate to some extent using rules governing syntactic structure (Chernov 2004). In this section, we base our understanding of syntax on the definition provided by Mona Baker:

“Syntax covers the grammatical structure of groups, clauses, and sentences: the linear sequences of classes of words such as noun, verb, adverb, and adjective, and functional elements such as subject, predicator, and object, which are allowed in a given language. The syntactic structure of a language imposes certain restrictions on the way messages may be organized in that language” (1992: 84).

Chernov contends that interpreters only pay attention to the syntactic structure “to the extent that this contributes to understanding the semantics of the discourse” (2004: 144). Here, he is in agreement with Lederer (1981) and Setton (1999). However, this does not mean that the syntactic structure is not used by interpreters for
anticipation purposes. For example, interpreters will expect speaker grammar to be correct (at least if the speakers are speaking their mother tongue) and this will influence their expectations with regard to the ending of sentences. In German or French, for example, there is gender agreement between pronouns, nouns and adjectives, and a violation of this expectation would perhaps create difficulties for the interpreter. This also means that if a sentence starts in a particular way, it will have to continue in a certain way according to grammatical rules. As Baker states:

“Because a grammatical choice is drawn from a set of options, it is (a) obligatory, and (b) rules out other choices from the same system by default. The fact that number is a grammatical category in English means that an English speaker [...] who uses a noun such as student or child has to choose between singular and plural” (1992: 84).

Moser (1978) points out that according to Fillmore's case grammar (1968), the verb supplies the greatest amount of information and has relations to all other cases. In terms of predicting the meaning, the second most important part of the phrase is the agentive, which is mainly the subject. In this case, prediction is also aided by identifying a verb as transitive or intransitive, for example. In the case of a transitive verb, the interpreter expects that an object will follow. With an intransitive verb, the interpreter can rule out a direct object.

Wherever options are ruled out, probabilities come into play, and so too does expectation. Huron notes that in music, “the strength of melodic expectations fluctuates over the course of the composition” (2006: 157). He explains this phenomenon by looking at chunks of musical meaning and explaining how their perceived beginning and end are shaped by expectation.

“When there cease to be expectations about what may happen next, it makes sense for brains to experience a sense of the loss of forward continuation. [...] The relative absence of expectation defines the boundaries of perceptual chunks” (Ibid).
Interestingly, these “perceptual chunks” seem similar to the units of meaning defined by Lederer and Seleskovitch (1984). It could therefore be suggested that a musical phrase and a unit of meaning in language are similar.

In music, however, more possibilities exist for the creation of such groupings, or phrasal structures, as compared to language, which is governed by syntactical structures. Indeed, as Patel points out, “unlike language, music is not constrained to transmit a certain kind of information, so that the range of sonic structures considered “music” by at least some people reflects the vast and ever-growing diversity of human aesthetic creativity and interest” (2009: 242).

As the potential structures are more varied, the musician will have to cross-reference his expectations in terms of phrasing with the identified musical genre – mentioned earlier – in order to make informed predictions based on the progression of a musical phrase. In Western music, for instance, certain ascending and descending patterns of pitch (contours) can be expected. Huron (2006) studied phrase contours in over six thousand European folk songs. Interestingly, he found out that “nearly 40% of the roughly ten thousand phrases analysed were classified as convex (i.e. arch-shaped) – the most common classification. [...] Ascending and descending phrases were the next most common contour types, accounting for nearly 50% of all the phrases between them”. Interestingly, further analysis showed that ascending and descending phrases tend to be paired together (Ibid 2006). This means that a musician, when improvising in such a musical genre, will be expecting a descending pitch to follow an ascending one. Huron and Von Hippel describe another type of musical structure that is applicable to “a wide variety of cultures” (2000: 59). They observe that “a large pitch interval tends to be followed by a change in direction” (Ibid). One would therefore expect that musicians in an improvised ensemble performance would be able to intuitively apply this knowledge in predicting the pitch direction.
d. **Anticipation based on repetitions**

Stylistic and rhetorical features play an important role during a spoken communicative event. The primary function of these devices is to emphasise a particular element of speech. One rhetorical device frequently used in speeches is repetition. In other words, the same word or syntactical structure is repeated throughout the entire speech or part of the speech. According to Ali, such devices are ancient and “word repetition is a feature that exists in all languages, and serves different purposes, rhetorical, emphatic, or otherwise” (2006:1). Music uses such devices to the same end. According to Margulis, musical repetition is “a rare cultural universal – a characteristic exhibited by the music of every known human culture. Although some traditions, for example certain strands of contemporary art music in the West, explicitly eschew repetition, they do so in conscious response to a tendency toward musical repetition that exists elsewhere in the culture” (2013:1). Musical repetitions can thus be considered “design features of music, essentially constitutive of the communicative form” (Ibid).

Because of their intentionality and universality, repetitions are easily identifiable and represent a useful cue for both interpreters in a simultaneous interpreting setting and musicians in an improvised musical performance setting.

Bartel (1997) explains how the terminology of stylistic and rhetorical features in linguistics was progressively applied to musicology during the Renaissance. He explains that, as linguistics was developing as a discipline, intellectuals of the time used its terminology to describe similar phenomena happening in music. He speaks of “musical-rhetorical features” and goes on to classify these devices. For instance, Bartel talks of anadiplosis, which is a recurrent rhetorical device. An anadiplosis is described in linguistics and in music as the repetition of the ending of a phrase at the beginning of the next one. A famous linguistic example is the musician Frank Zappa’s quote ‘information is not knowledge, knowledge is not wisdom, wisdom is not truth, truth is not beauty [...]’, etc. Bartel explains that “the anadiplosis, among other figures of repetition, is rooted and familiar equally in music as in rhetoric” (1997: 181). Even without knowing the definition of anadiplosis, the human brain can easily identify a repetitive pattern,
which means that interpreters and musicians alike make use of such cues, at a more or less conscious level, to anticipate that the beginning of the next sentence or phrase will be based on the end of the previous one. For instance, in the example given above, based on the repetition of the previous structure, the interpreter will be able to anticipate that the next sentence will start with ‘beauty is not’ before the speaker has uttered it.

Another figure of speech which finds its equivalent in music is the anaphora. In linguistics, an anaphora is the repeated use of a word or a phrase at the beginning of sentences, whereas in music, it is the repetition of an opening phrase (Bartel 1997). A famous example of the power of anaphora can be found in the speech given by Martin Luther King: I have a dream. Once listeners have identified the pattern, that is to say the deliberate use of this device, they will come to expect it before it actually appears in the speech/musical performance. According to Meyer, “reiteration is the basis of what may be called the principle of successive comparison. A given pattern establishes an intraopus norm, a base for expectation within the particular piece” (1961: 152). Meyer explains that in improvised jazz music, for example, a norm is created at the beginning of the piece. This norm becomes “the basic organizing principle in this music” (Ibid 1961: 243) and is perceived by the listener as regularity. This means that once an anaphora is identified by the simultaneous interpreter and the musician, they become able to accurately predict the regular reoccurrence of this feature before it is made.

In speech, another commonly used rhetorical feature is the tricolon. A tricolon is usually defined as the repetition of a word or a grammatical structure three times. This figure of speech is found across languages and across history, and its effect, across cultures, is recognized as giving a sense of completeness and harmony. For instance, Julius Caesar’s famous sentence veni, vidi, vici is a tricolon. During the simultaneous interpreting of a constructed speech, if the speaker has uttered two parallel grammatical sentences in a row, the interpreter’s knowledge of rhetoric will make it possible to predict with a good level of accuracy that the speaker is about to utter a third sentence with the same grammatical structure as the previous two. In the same way, if a noun is qualified by two adjectives, the interpreter will know that a third adjective is likely to be uttered by the speaker.
In music, a motif is a short melodic or rhythmic pattern that is repeated. Interestingly, Leach (2009) explains that the “rule of three” also applies to music. He indicates that across musical genres, motifs are repeated for aesthetical effect. However, in language, the same pattern is repeated three times in the same way, whereas in music the pattern tends to change in the third repetition.

Ex. 2: Opening bars of Vivaldi’s Concerto No. 1 in E major, Op. 8, RV 269, "La primavera" (Spring)

"Vivaldi’s Spring starts with a simple one bar motif (1), then repeats it verbatim (2). This has established a pattern in our minds, and unconsciously sets up our expectations that we'll hear the pattern a third time. He defies our expectations, however, and takes the melody in a new direction (3)” (Leach 2009).

As we can see, the third element is generally used to disrupt the routine that has been established and upset listeners’ expectations. This being said, such a pattern is commonly used. Seasoned musicians might thus reasonably be expected to anticipate a change of motif when it has been repeated twice in a row. The interpreter meanwhile will expect repetitions of this sort to come in threes. In this case, what is being anticipated by the musician and by the interpreter differ, but the cue for anticipation is the same.
V. Practical discussion: Speech and sheet music analysis

1. Analysis of Obama’s victory speech

a. Analysis of anticipation based on extra-linguistic features

In order to illustrate the cues that interpreters might use to anticipate the content of a speech in a simultaneous interpretation setting, we have chosen to analyse the victory speech that Barack Obama gave following his presidential election in November 2012 (Appendix I). Obama is known for his oratory skills but it is worth mentioning that he usually works with pre-prepared speeches, and reads them on a teleprompter. This aside, the speech provides excellent material for an analysis of anticipatory cues that may be given in a speech that must be interpreted. We believe that many of the main characteristics would also be found in an improvised speech.

As we explained earlier, it is important for the interpreter to have a sound knowledge of the communicative situation in general and of the participants in particular. Knowledge of the speaker allows the interpreter to anticipate certain characteristics of the speech. In this case, knowledge of Obama’s oratory style allows the interpreter to prepare for a well-structured speech that will contain a high number of rhetorical features – more of which later – and a generally emphatic tone. In addition, an awareness of Obama’s political stance and his presidential campaign allows the interpreter to anticipate the point of view of the speech. It is thanks to these cues that the interpreter can pick up on references to Obama’s educational programme, when he says “we want our kids to grow up in a country where they have access to the best schools” (Appendix I, lines 64 to 66), and to his emigration plan when he states “we believe [...] in a tolerant America open to the dreams of an immigrant’s daughter who studies in our schools” (lines 73 to 77). Furthermore, for an interpreter who is accustomed to Obama’s speeches, it is a safe bet to assume that he will refer to his family at some point in the
speech. Indeed, as the interpreter hears “I wouldn’t be the man I am today without the woman who agreed to marry me” (line 28), the expectation will be that the speaker will subsequently declare his affection to his wife, and go on to refer to his daughters.

The intended audience also plays an important role in the communicative situation. The role of the audience is of particular importance on this specific occasion as the interpreter has to expect pauses in the speech to allow for the audience’s cheering and applause. Indeed, this is the case throughout the speech, notably between 00’20” and 00’25”, between 00’57” and 01’08” (see video link in Appendix I), etc. As can be expected, Obama also directly addresses members of this audience by thanking his campaign team using the second person (lines 34 to 36). The interpreter should know that his address is also being broadcast on national television and that Obama thus needs to address both people who did and people who did not vote for him. With such knowledge, interpreters will be able to anticipate references to Obama’s opponent, and when they hear the sentence “whether you held an Obama sign or a [...]” (lines 18 and 19), they will be able to mentally complete the unit of meaning with “a Romney sign”.

In this particular speech, knowledge of the participants goes hand in hand with knowledge of the subject matter, as Obama embodies his party’s political stance. However, knowledge of the subject matter, that is to say, of the country’s history, of its political and electoral system, and of its economic and social situation will allow the interpreter to make additional inferences as the speech progresses. For instance, when the interpreter hears “200 years after [...]” (line 6), it will be possible to anticipate a reference to the Declaration of Independence, which is indeed the case. Obama talks of “a former colony [that] won the right to determine its own destiny” (lines 6 and 7). Similarly, after hearing “I want to thank [...] the best vice-president anybody could ever hope for” (lines 26 and 27), interpreters should be able to predict that Joe Biden’s name will be mentioned. Incidentally, prosody also plays a part here in telling the listener that Joe Biden’s name will come straight after ‘hope for’, because in grammatical terms, the sentence could also continue “for all of his support throughout the campaign”, to give just one example.
We explained how paying attention to prosody could help interpreters predict the end of a sentence or an idea. Further examples of how such variations in pitch can help determine the end of a unit abound throughout the speech. Just to give one example, at 9'48'', Obama says "We want our children to live in an America that isn’t burdened by debt" (line 67). This is a grammatical sentence per se. However, his pitch does not lower at the end of it, as it would if the sentence were actually complete. Therefore, interpreters know that another unit of meaning is to follow, which is indeed the case as he carries on with two relative clauses “that isn’t weakened by inequality, that isn’t threatened by the destructive power of a warming planet” (lines 67 and 68). His voice subsequently lowers at the word "planet", which in turn indicates the end of the idea and interpreters can anticipate the beginning of a new one. Similarly, at 19'43'', with “I believe we can seize this future together” (line 143), his voice becomes suddenly significantly louder. This can be used by interpreters as a cue that as Obama is building momentum towards the conclusion of his speech.

As we indicated, visual cues can help interpreters to anticipate the content of a speaker’s presentation. However, Obama is reading his speech on two teleprompters that are positioned on his right and on his left. This accounts for most of his head movements as he alternately faces right and left and so cannot be considered a highly useful clue as to the content of his speech. Nonetheless, some of his hand gestures and facial expressions are useful cues for interpreters and can be used to anticipate Obama’s intended meaning. For instance at 00'20'', Obama points his stretched out left hand in front of him as he says “the task of perfecting our union moves [...]” (line 7), before uttering the word “forward”. Interpreters have other ways of anticipating the occurrence of the word "forward", for example based on context or syntax (more of which later), but this gesture is a clear indicator of his thought process and of the direction he intends to take. Another example in which body language can help interpreters to predict the end of a unit of meaning occurs at 00'57''. Obama says “we will rise together as one nation” (lines 11 and 12), and pauses while looking at the camera in front of him and pointing his index finger at it before going on to say “as one people”. By noticing this gesture, interpreters are able to predict a second reference to the viewers before he actually utters these last three words.
b. Analysis of anticipation based on linguistic features

Interpreters simultaneously interpreting Obama’s victory speech would be working from their C language i.e. English into their A language, the A language being irrelevant to our analysis. Ideally, they would have a very solid knowledge of American English along with all of its common grammatical rules, syntactical features, collocations, etc. Thanks to such knowledge, they would be able to process the linguistic features of the speech as they are interpreting, and in doing so, and as we explained earlier on, they would be able to narrow down their expectations of what is to come by ruling out incorrect options, predicting certain rhetorical features by recognizing them as they are analysing the speech.

Earlier, we explained that in any language, certain sets of words tend to occur together more often than not. We identified collocations or collocational restrictions as being a highly useful cue for interpreters as they anticipate the meaning of the speaker’s various utterances. Collocations help interpreters to rule out potential options. This is an anticipatory process that occurs throughout the simultaneous interpretation of any speech, and there are numerous examples of such cues in Obama’s speech. The grammatical and syntactical restrictions in the speech are processed at the same time as the collocational restrictions, allowing the formulation of more accurate predictions.

For instance, at 2’26”, Obama says “you made your voice [...]” (line 19). Before hearing the end of this unit, the interpreter is able to mentally list some of the possible options that would complete that sentence. There are not many possible options. For syntactical reasons, if the phrase is to be grammatically correct, the interpreter knows that this unit should be completed by a verb in the past participle form, by a comparative adjective, or by a transitive verb followed by a complement as follows. For instance:
- you made your voice ... heard
- you made your voice ... louder
- you made your voice ... sound calm

However, syntactical considerations aside, and taking the subject matter into account, any listener is most likely to rule out the last two options, simply because, in English, making one’s voice heard is the most commonly used collocation.
Similarly, at 04’36”, “before our very [...]” (line 31) can be heard. In this case, the processing of the different options does not even have to take syntax into account, as this is the recognisable beginning of the fixed idiom before one’s very eyes, and the interpreter should be able to mentally complete this unit of meaning with the word “eyes” without having to weight in other options. Indeed, according to Baker, fixed idioms are “frozen patterns of language which allow little or no variation in form and [...] often carry meanings which cannot be deduced from their individual components” (1992:63). Other examples of fixed idioms are present throughout the text. That is for instance the case of the utterance “come in fits and starts” at 11’52” (line 80). This is also an idiom, the end of which can be anticipated before it is actually uttered by the speaker.

The same mental processing can be applied at 11’28”. Obama says “That’s the vision we [...]” (line 79). For syntactical reasons, the interpreter knows that this unit of meaning needs to be completed with a verb. The Oxford Collocation Dictionary tells us that the noun vision, when it refers to the “ability to see/plan for the future”\(^3\), only collocates with the following verbs: to have, to develop, to convey, to expand on/upon, to outline, to promote, to impose, to share, and to cloud. Because of the context, interpreters know they can eliminate the negatively connoted to impose and to cloud, and can thus anticipate the occurrence of one the remaining options.

In part IV, we discussed how the identification of stylistic and rhetorical features can be used as a useful cue for anticipating the content of a speech in a simultaneous interpretation setting. Obama is known for his well-constructed speeches, and many such stylistic and rhetorical features can be identified throughout the speech, which should allow the interpreter to make accurate predictions. We explained how identified repetitions in the speech will allow the interpreter to formulate predictions, for example about the number of times the repeated items will occur, and in the following, we will analyse some of the many examples contained in the speech.

\(^3\)www.ozdic.com
For instance, at 01’52”, Obama starts a new sentence with “whether you voted for the very first time” (line 16). At this point in time, during the analysis and interpretation process, interpreters are not able to predict any specific rhetorical pattern. The only clue they have is of a syntactical nature. Indeed, they know that when uttered at the beginning of a sentence, whether is a conjunction introducing an adverbial clause – which, in terms of meaning, introduces the notion of doubt, of possibilities, or of presenting several alternative options. For syntactical reasons, interpreters are able to infer that the sentence will be completed at some later stage by a main clause: 

\[ \text{subject} \, + \, \text{verb} \, + \, \text{complement} \.

However, at 2’14”, while the sentence is still not completed and they hear “whether you pounded the pavement” (line 18), they can recognize that same pattern being repeated:

\[ \text{whether you} \, + \, \text{verb at the simple past tense} \, + \, \text{complement} \.

At this point, interpreters can assume this is a deliberate strategy of the speaker, and are able to identify the use of anaphora as a rhetorical feature, that is to say the repetition of a certain word sequence at the beginning of a phrase. We explained earlier that for maximum rhetorical impact, speakers tend to resort to tricols, that is to say, the repetition of an item three times. Thanks to that linguistic knowledge, from this point onward, interpreters are able to predict the ending of that sentence to the extent they can expect the occurrence of a third repetition of the pattern followed by the main clause anticipated earlier on:

\[ \text{whether you} \, + \, \text{verb at the simple past tense} \, + \, \text{complement} \, + \, \text{subject} \, + \, \text{verb} \, + \, \text{complement} \.

It is also worth noting that in this specific case, interpreters have the luxury of time to process this information, as Obama pauses while the audience is cheering from 02’16” to 02’22”, which should make this specific anticipatory process all the easier.

Obama’s use of such rhetorical features, i.e., anaphora + tricolon, is not a coincidence, as it re-occurs frequently throughout the speech. Having successfully identified this pattern a first time during the interpretation, interpreters will be more
inclined to recognize it later on in a speech, thus speeding up their mental prediction-making strategy when faced again with such feature.

From 07’06” to 07’14”, for instance, Obama utters the phrase “you’ll hear the determination in the voice of a young field organizer who’s working his way through college [...] to make sure every child has that same opportunity” (lines 47 and 48). This time, this sentence does not give any indication as to the semantic or syntactical items that could follow. However, from 07’21” to 07’30”, the following sentence is “you’ll hear the pride in the voice of a volunteer who’s going door to door because her brother was finally hired when the local auto plant added another shift”. Anaphora (you’ll hear) aside, this can be easily recognised as a parallelism, that is to say, the reiteration of a grammatical structure. From the beginning of that second sentence and remembering the structure of the first sentence, the interpreter is able to identify the use of parallelism as a deliberate rhetorical strategy and to anticipate the completion of the following structure:

“You’ll hear”
+ noun phrase describing an emotion or feeling
+ “in the voice of”
+ noun phrase describing a person’s occupation
+ relative clause introduced by “who + verb in the present continuous tense”
+ circumstantial complement of cause.

Because of the presence of the anaphora, interpreters can also expect this structure to be repeated a third time, and when at 7’ 36”, Obama says “you’ll hear”, this expectation is legitimately confirmed, and they can anticipate the repetition of the grammatical structure described above a third and last time.

Similarly, from 14’24” to 14’28”, Obama says “This country has more wealth than any nation, but that’s not what makes us rich” (line 101). No particular figure of speech can be identified up until this point, but from 14’40 onwards, when interpreters hear the following sentence “we have the most powerful military in history” (lines 101 and 102), even if the grammatical structure is not exactly similar to that of the first part of the first sentence, they are able to recognise that Obama is building another parallelism. The
nature of this parallelism is more semantic that syntactic, and can be described as follow:

**Affirmative superlative sentence positioning the current situation in the US above other items in a specific domain**
+ conjunction “but”
+ negative anaphoric sentence “that's not what makes us”
+ adjective referencing the specific domain described before.

Once that pattern identified, interpreters can anticipate the second part of the second and third sentences making up this parallelism. They can expect the second sentence “we have the most powerful military in history” to continue with “but that's not what makes us + adjective related to power”, and so on and so forth for the third sentence “our university, our culture are all the envy of the world” (lines 102 and 103). Again, this specific parallelism occurs three times, making it a tricolon.

With or without anaphora and tricolons, the presence of other parallelisms throughout the text also allows interpreters to make accurate predictions during the interpretation process. For instance, from 13’14” to 13’18”, they can hear “you voted for action, not politics” (line 91). Again, that sentence, when taken in isolation, does not allow any predictions to be made about the next sentence. But when from 13’21” to 13’24”, interpreters hear “you elected us to focus on your jobs” (line 91), helped by listening to the prosody – the speaker’s voice does not lower at the end of your jobs, which indicates the sentence is not yet complete – interpreters are able to identify the presence of a parallelism with the following structure:

“you” + verb + complement + “NOT” + complement

This allows them to anticipate the re-occurrence of the negative pronoun not, followed by a complement of opposition.

This analysis has illustrated that a variety of cues for anticipation are available to interpreters. Although this analysis has looked at each cue individually, an interpreter would, of course, make use of several cues simultaneously. Syntax and subject matter might, for instance, be primary cues for most interpreters. However, the extent to which
the different cues are used will depend both on the speech in question and on the interpreter’s own technique.
2. Analysis of Vivaldi’s Concerto in A minor, op. 3 No. 6

a. Analysis of anticipation based on musical context

For illustrative reasons, we have chosen to base our analysis on sheet music. Baroque music has been chosen because it is likely that when it was originally played, soloists would have improvised their solo sections. This section aims to illustrate the cues that may be used by a musician when simultaneously playing and listening to Vivaldi’s concerto in A minor. These early improvisations were later written into the sheet music. The advantage of using sheet music rather than a recording is that it allows us to provide excerpts. We also contend that anticipation based on musical context and melodic features would still take place were a musician listening to another musician playing from sheet music. This is supported by research by Huron (2006). We can thus safely assume that similar processes take place when a musician is listening to music improvised by another musician, or an unfamiliar piece of sheet music played by another musician. Sheet music is more practical in this analysis as excerpts can be provided.

The sheet music that we have chosen for this analysis is Vivaldi’s Concerto in A minor for Violin, Strings and Basso Continuo from “L’estro armonico” op. 3 No. 6 / RV 356 (Appendix 2). The edition is that for Violin and Piano by Paul Klengel.

The aim is not to establish the extent to which the different cues may be used, nor is it to establish whether or not a musician would pick up on cues better than an ordinary listener. The comparison between a simultaneous interpreter and a musician playing in an ensemble group is drawn because both are combining two activities: listening and production.

Antonio Vivaldi (1678 – 1741) composed during the Baroque period (along with Bach, Handel and Purcell). The concerto for violin which we have selected is one of around two hundred violin concertos that he composed. One of his best known works is

[^4]: [http://www.themeandvariations.org/Topics/improvisation.html](http://www.themeandvariations.org/Topics/improvisation.html)
*The Four Seasons*, which is a series of four violin concertos, each of which portrays a different season (Roeder 1994).

We will first examine the probabilities that can be deduced based on context. What can the musician predict based on knowledge of the composer, the musical genre and the dynamics of the piece?

A large corpus of Vivaldi's works is available to the musician. Today, a total of over 500 concertos written by Vivaldi are in existence, along with 40 cantatas, 22 operas and over 60 sacred works[^5]. This means that a musician hearing a previously unheard Vivaldi concerto would have certain expectations with regard to the piece, based on their knowledge of Vivaldi as a composer. A detailed description of the characteristics of Vivaldi’s music would be unwieldy and not suited to the purposes of this thesis, hence the following characteristics have been chosen selectively and for illustrative purposes. According to Roeder, a musician may expect a Vivaldi concerto to display “impelling rhythmic vitality, varied texture and relatively spontaneous sounding musical ideas” (1994), as well as a logical continuity in musical movement through the piece. Vivaldi's music is also known for its repetition, often of broken chords[^6]. Typically, Vivaldi's concertos are written in three movements, an Allegro, a slow movement and a final Allegro. This would allow a musician to anticipate a slow movement following the first Allegro, and upon hearing this slow movement, to be almost sure that a final Allegro would follow. What is more, the musician may also anticipate the key of the second movement based on that of the first. Around one third of the slow movements are in the same key as the outer movements and in slightly fewer cases the relative major or minor is used, and in fewer again the second movement is in the dominant of the first. These represent the most common key juxtaposition choices made by Vivaldi in his concertos (Roeder 1994).

The texture of Vivaldi’s concertos is described as continuo homophony. This means that the melody serves as the decoration to the chord progressions in the

[^5]: http://donlevi.tripod.com/vivaldi.html
[^6]: http://www.dorak.info/music/contents.html
continuo, meaning that it is in fact the base line which is most important\(^7\). Vivaldi is also known for the arpeggiation of his chords, and broken chord patterns can be found throughout his musical corpus.

For example in Ex. 3 from the Concerto in A minor, there is a broken chord which is repeated from the end of measure 7 to the beginning of measure 8.

**Ex. 3.** Vivaldi, Op. 3, No. 6, RV 356; I. Allegro, mm. 7 – 9

![Excerpt from Vivaldi's Concerto in A minor](image)

Although broken chords feature in the music of other musicians, Vivaldi was also the first of his time to also break down dissonant chords (i.e. a chord where there is a suspension) (Talbot, 2011). This is shown in the same excerpt (above) at the end of the second bar. One could suppose that the greater the number of Vivaldi concertos already heard by the musician, the better the musician would be able to predict these features in the concerto in question. This would also apply in an improvised music setting, where one musician in particular may become known for their particular style. Django Reinhardt, for example, was known for his triad arpeggios\(^8\).

Concerto in A minor for violin, strings and basso continuo is, as previously stated, a violin concerto from the Baroque period. In terms of style, therefore, the musician would be able to formulate expectations based on this information. Firstly, because this is a concerto for violin, the range of notes is limited from G3 to a high note of about C8 (the highest possible note depends on the skill of the player)\(^9\). Baroque music also has a certain number of distinguishing features: the mood, once defined, remains constant throughout the piece, repetition of rhythm and of melody can be expected, and the

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\(^7\) [http://www.dorak.info/music/contents.html](http://www.dorak.info/music/contents.html)


\(^9\) [http://www.philharmonia.co.uk/thesoundexchange/the_orchestra/instruments/violin/range/](http://www.philharmonia.co.uk/thesoundexchange/the_orchestra/instruments/violin/range/)
dynamics may remain constant for prolonged periods\textsuperscript{10}. The piece is a concerto, and similarly to other concertos of this period, the Concerto for violin, strings and bass contains \textit{tutti} sections and \textit{solo} sections (for the violin). The Concerto follows a similar pattern to other Vivaldi concertos. According to Roeder, the ritornello, which contains the main theme of the music, is played \textit{tutti} (1994). This is indeed the case in the Concerto in A minor, where the main theme of the first movement is introduced in a \textit{tutti} section at the very beginning (see Ex 4).

\textbf{Ex. 4. Vivaldi, Op. 3, No. 6, RV 356; I. Allegro, mm. 1 – 3}

\includegraphics[width=\textwidth]{Ex4.png}

This theme is then repeated by the solo violin from measure 12. This theme is typical of those preferred by Vivaldi in his concertos. The tonic key (A minor) is defined here thanks to a fairly simple pattern of notes, which are also, as is often the case with concertos, triadic. If only the quavers and the lead semi-quavers were to be played, the notes in this theme would exactly follow the chord of A minor (A, C, E), with just one exception.

In terms of the solo sections, the musician would expect them to be more embellished than the \textit{tutti} sections. Vivaldi was known for creating pieces where soloists could show off their virtuosity (Roeder 1994). This is also true of this piece. Here we see the end of the main theme played by all, and the violin solo which then begins to respond with a series of semiquavers (see Ex. 5).

\footnote{http://library.thinkquest.org/27927/Baroque_Characteristics.htm}
Although this is a violin concerto, musicians may have similar expectations about a jazz ensemble, where players typically begin and end with a melodic theme, between which the musicians take turns to play solos in which they either embellish the theme melody or create a new melody in keeping with the chord sequence (Johnson-Laird, 2002, Meyer 1961). Indeed, in the original version of the Concerto, as previously stated, the soloists would have improvised their sections based on the theme.

The second movement of this concerto is unusual in that it is not in the same key or relative major as the first, nor is it in the dominant key. Instead it is the key of D minor. However, it does follow the usual pattern in that the second movement is slower and lamenting. The final movement then reverts back to the original key of A minor.

The dynamics in this work could also help the musician to formulate expectations. Of course, these markings would not have featured in the original score it was very difficult to produce crescendos and diminuendos using the instruments available at the time. However, it is still interesting to note these dynamic changes as they would be present in a modern recital of the piece and thus could be used as cues in the formulation of expectations. In the Allegro, the crescendos and diminuendos stretch over several phrases, with a crescendo often being followed by several measures of forte playing. However, in the second movement, the Largo, the crescendos and diminuendos follow each other more closely, almost as someone would breathe. This reflects Gabriellson’s hypothesis, noted earlier, that crescendos are followed by diminuendos. This sequence can be seen over several measures (see Ex. 6).

Ex. 5. Vivaldi, Op. 3, No. 6, RV 356; I. Allegro, mm. 59 – 61

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11 http://library.thinkquest.org/27927/Baroque_Characteristics.htm
As mentioned in IV.1.d, dynamics are also often used in both music and speech to build momentum towards a conclusion. This can also be seen in the Concerto in A minor, at the end of the first movement, where there is a crescendo in measure 74 which leads to a repetition of the theme in forte until the movement concludes in measure 80 (see Ex. 7). Like many Baroque pieces, one dynamic is sustained for a fairly lengthy period. As previously mentioned, this is because at the time, it was difficult to produce crescendos and diminuendos on the available instruments\textsuperscript{12}.

Vivaldi’s Concerto in A minor also falls in with expectations that a musician would formulate based on knowledge of chords and cadences. Indeed, the piece begins as one would expect, with a note in the tonic triad. Although the upbeat is \textit{sol}, the first

\textsuperscript{12} http://library.thinkquest.org/27927/Baroque_Characteristics.htm
note of the first bar is do (see Ex. 4), which is in line with what a musician would expect based on their musical experience (IV.2.b).

Furthermore, the first movement starts with a classic chord progression sequence (see Ex. 8). The chord progression follows the most common progressions listed in Piston and DeVoto’s table, moving from the chord I (A minor) to chord V (E major) and back to chord I in the first three measures. The second movement also starts off on chord I (D minor), moves to chord V (A major), and then back to chord I. The third movement moves from chord I to chord V (E major) and then back to chord I. Not only are these chord movements in keeping with the frequent chord movements listed by Piston and DeVoto, they are also repeated within the piece, which would allow the musician to formulate even more definite expectations.

Ex. 8. Vivaldi, Op. 3, No. 6, RV 356; I. Allegro, mm. 1 – 3

Another predictable chord sequence can be seen from measure 4 of the first movement. The progression here is chord IV, to III, to II, to I (see Ex. 9). Looking at Piston and DeVoto’s chord progression table, this progression is listed as being ‘less frequent’. However, as Vivaldi’s chords are broken, the musician might base their predictions on the base line, which is gradually descending note by note before resolving in the tonic key. Although the musician may therefore initially be more likely to expect chord V to follow chord IV based on the chord progression table, once they have heard chord III, they may well revise their expectation and concentrate their attention on the base line. Meyer indicates that “as we listen to music we are constantly revising our
opinions of what has happened in the past in the light of present events [... and] continually altering our expectations [...]. The more complete a series becomes, the more specific the hypothetical meanings attributed to parts of the series” (1961: 49).

Ex. 9. Vivaldi, Op. 3, No. 6, RV 356; III. Allegro, mm. 4 – 7

In terms of the cadential endings, these also follow a fairly typical pattern. The first movement ends with a perfect cadence (chord V to I), as do both the second movement (V to I) and the third movement (V to I). This pattern is therefore fairly predictable both in terms of the frequency of cadences in a general sense, and also within the piece. Incidentally the cadences also include suspended chords. As mentioned previously, Vivaldi was known for using dissonant and suspended chords. In Ex. 10, the E major chord is suspended with an A which is a suspended 4th. In Ex. 11, the E major chord is again suspended. It includes a D, which is a suspended 7th. The suspension in these cases creates a feeling of instability, and a strong feeling of anticipation (Huron 2006). Furthermore, at the end of the first and third movements, the final note can be anticipated not simply because of the cadential pattern, but also because the leading note is played by the violin, and as Huron points out, “the probability of hearing the tonic pitch is increased if we are currently hearing the leading tone” (2006:67).
Incidentally, there is a clear repetition of the end of the first movement at the end of the third movement, in terms of the rhythmic structure, the melody line and the cadence. The following example shows the end of the first movement.

Ex. 11. Vivaldi, Op. 3, No. 6, RV 356; I. Allegro, mm. 143 – 145
Of course, anticipation of melody and rhythm is interdependent. The repetition of the rhythm may in itself allow a musician to anticipate the melody. Where a rhythm is repeated, listeners can anticipate the temporal onset of a particular note (Huron 2006).

Let us now turn our attention to the phrase contours in Vivaldi’s concerto in A minor. The first point that can be made is that small intervals predominate over larger ones. Musicologists have found that this tends to be the case (Huron 2006). When listening to Vivaldi’s concerto, the musician would expect to hear a greater number of small intervals, and this expectation would be confirmed. Furthermore, there is also evidence to support the theory that large interval changes are followed by reversals (Huron 2006). This is often the case in Vivaldi’s concerto in A minor (see Ex 12).

Ex. 12. Vivaldi, Op. 3, No. 6, RV 356; I. Allegro, mm. 28 – 31

The excerpt shown here shows large interval drops, followed by another small drop in interval, and then a reversal of the pattern back up the scale again. It also shows a number of ascending phrases, which were also considered to be common by Huron (2006). The melody does not, however, provide us with many examples of convex phrases which were actually found by Huron to be the most common type of phrase contour. However, in this case the musician may base their expectations on other factors, which are easier to anticipate, for example based on the chords or cadences discussed above, or the repetition within the piece which will now be examined.

Vivaldi’s Concerto in A minor is highly repetitive. This in itself could be expected as it dates from the Baroque period. As with a jazz piece, a theme is established and then embellished (Meyer 1961). There is a great deal of repetition in terms of the patterns found in the music. Let us first consider the first movement. In measures 3 to 7, the same
pattern is repeated four times, moving down one note each time (see Ex. 9). There are also numerous exact repetitions. Measures 1 and 2 of the Allegro are mirrored by the solo violin in bars 13 to 15, before the original theme is embellished. In terms of the rhythm in particular, there are numerous repetitions throughout the first movement of the same rhythmic patterns. There are numerous incidences of four quavers followed by four semi-quavers followed by two quavers (as in Ex. 9). Another common feature is a grouping of a quaver with two semi-quavers. The left hand of the piano is particularly repetitive. Here almost only quavers are played, and numerous times the left hand comes in on the off-beat.

The second movement is again repetitive. Here there are numerous groupings of semiquavers, and often the notes change little. We can see various incidences where a note sequence is repeated twice and then changed, and again there are repetitions of the same note patterns. In this instance, the pattern is repeated three times, moving down one note each time (see Ex. 6). This thus also mirrors the patterns found in the first movement. The most common rhythm is that of several notes of equal value being played one after the other, be they semi-quavers or demi-semi-quavers. There are few deviations from this.

Finally, the third movement mirrors the first, in that the key signature is the same, and the chord progressions are very similar. In some instances, measures from the first movement are mirrored in the third. For example measures 21 – 23 from the first movement are mirrored in bars 25 to 27 of the third (although the sequence ends differently). Furthermore there are numerous repetitions of the main theme in the third movement (see Ex.13).
This same pattern (in terms of rhythm and relationships between notes) is repeated in measures 8 – 10, 30 – 32, 50 – 52, 52 – 54, 91 – 93, 93 – 95, 99 – 101, 101 – 103 and 115 – 117.

This sheet music analysis has shown that patterns can indeed be identified in music which would allow the listener to predict with a greater or lesser degree of accuracy what will come next. It is important to note here that some sequences in the music are more predictable than others, and this is also the case with simultaneous interpreting, where some points in a speech may be highly predictable, while some may be surprising to the interpreter.
VI. Conclusion

The aim of this thesis was to establish whether similar cognitive processes might be used in simultaneous interpreting and musical ensemble playing, by considering the cues used by interpreters and musicians to anticipate what will be said/played.

The point-by-point literature analysis allowed us to regroup different existing theories regarding language and music processing within the framework of anticipation theory. It revealed that a number of parallels can legitimately be drawn between the cues used for anticipation in both disciplines. When the theory set out in the literature review was applied to a speech and to a piece of music, we saw that the cues were indeed present in both cases and could be used by the interpreter or the musician to predict what was to come.

The literature review allowed us to highlight similarities in the way interpreters and musicians can process different cues during the anticipation process. However, our practical analysis of both sheet music and speech has demonstrated that, while all the cues we detailed in the point-by-point analysis were of use, it would be very difficult to formulate accurate predictions based on one cue alone. All of the cues are interconnected and complementary, and make for a multi-layered anticipatory process in both disciplines.

The practical analysis also illustrated that some cues are probably more useful than others. For instance in both the music and the speech, repetition seemed very helpful in aiding accurate prediction. Prosody and dynamics, meanwhile, were often helpful only in conjunction with other cues, and could not be used on their own for the formulation of accurate predictions. Interestingly, the relative importance of the different anticipation cues was similar in both disciplines.

The evidence that we have collected substantiates the view that similar cues might be used in both tasks. The extent to which they are used in the two tasks could now be tested. For example, musicians and interpreters could be asked to complete
questionnaires with regard to the cues that they use and experiments could be carried out in which some cues are removed. Such research would pave the way for a new understanding of the relationship between music and language. Future research may also consider whether someone who is adept at processing cues in one discipline would have greater facility in the other.

Moreover, comparing anticipation processes in improvised ensemble playing and simultaneous interpreting was based on the fact that both disciplines consist in processing external sounds while producing one’s own, in line with the external stimuli. However, the framework for anticipation that we described could also be applied to other language or music-related disciplines that do not necessarily deal with that level of simultaneity of tasks, such as learning a new second language or how to play a new instrument. We can also posit that, since anticipation and the processing of expectations occur during the undertaking of any type of task that requires a learned skill, this research could be ultimately extended to other disciplines.
Thank you. Thank you. Thank you so much.

Tonight, more than 200 years after a former colony won the right to determine its own destiny, the task of perfecting our union moves forward.

It moves forward because of you. It moves forward because you reaffirmed the spirit that has triumphed over war and depression, the spirit that has lifted this country from the depths of despair to the great heights of hope, the belief that while each of us will pursue our own individual dreams, we are an American family, and we rise or fall together as one nation and as one people.

Tonight, in this election, you, the American people, reminded us that while our road has been hard, while our journey has been long, we have picked ourselves up, we have fought our way back, and we know in our hearts that for the United States of America, the best is yet to come.

I want to thank every American who participated in this election. Whether you voted for the very first time or waited in line for a very long time—by the way, we have to fix that—whether you pounded the pavement or picked up the phone, whether you held an Obama sign or a Romney sign, you made your voice heard and you made a difference.

I just spoke with Governor Romney and I congratulated him and Paul Ryan on a hard-fought campaign. We may have battled fiercely, but it's only because we love this country deeply and we care so strongly about its future. From George to Lenore to their son Mitt, the Romney family has chosen to give back to America through public service. And that is a legacy that we honor and applaud tonight. In the weeks ahead, I also look forward to sitting down with Governor Romney to talk about where we can work together to move this country forward.

I want to thank my friend and partner of the last four years, America's happy warrior, the best vice-president anybody could ever hope for, Joe Biden.

And I wouldn't be the man I am today without the woman who agreed to marry me 20 years ago. Let me say this publicly. Michelle, I have never loved you more. I have never been prouder to watch the rest of America fall in love with you too as our nation's first lady.

Sasha and Malia before our very eyes, you're growing up to become two strong, smart, beautiful young women, just like your mom. And I am so proud of you guys. But I will say that, for now, one dog's probably enough.
To the best campaign team and volunteers in the history of politics the best – the best ever – some of you were new this time around, and some of you have been at my side since the very beginning.

But all of you are family. No matter what you do or where you go from here, you will carry the memory of the history we made together. And you will have the lifelong appreciation of a grateful president. Thank you for believing all the way to every hill, to every valley. You lifted me up the whole day, and I will always be grateful for everything that you’ve done and all the incredible work that you’ve put in.

I know that political campaigns can sometimes seem small, even silly. And that provides plenty of fodder for the cynics who tell us that politics is nothing more than a contest of egos or the domain of special interests. But if you ever get the chance to talk to folks who turned out at our rallies and crowded along a rope line in a high school gym or – or saw folks working late at a campaign office in some tiny county far away from home, you’ll discover something else.

You’ll hear the determination in the voice of a young field organizer who’s working his way through college and wants to make sure every child has that same opportunity. You’ll hear the pride in the voice of a volunteer who’s going door to door because her brother was finally hired when the local auto plant added another shift.

You’ll hear the deep patriotism in the voice of a military spouse who’s working the phones late at night to make sure that no one who fights for this country ever has to fight for a job or a roof over their head when they come home.

That's why we do this. That's what politics can be. That's why elections matter. It's not small, it's big. It's important. Democracy in a nation of 300 million can be noisy and messy and complicated. We have our own opinions. Each of us has deeply held beliefs. And when we go through tough times, when we make big decisions as a country, it necessarily stirs passions, stirs up controversy. That won't change after tonight. And it shouldn't. These arguments we have are a mark of our liberty, and we can never forget that as we speak, people in distant nations are risking their lives right now just for a chance to argue about the issues that matter the chance to cast their ballots like we did today.

But despite all our differences, most of us share certain hopes for America's future. We want our kids to grow up in a country where they have access to the best schools and the best teachers a country that lives up to its legacy as the global leader in technology and discovery and innovation with all of the good jobs and new businesses that follow.
We want our children to live in an America that isn't burdened by debt, that isn't weakened up by inequality, that isn't threatened by the destructive power of a warming planet.

We want to pass on a country that's safe and respected and admired around the world, a nation that is defended by the strongest military on Earth and the best troops this – this world has ever known but also a country that moves with confidence beyond this time of war to shape a peace that is built on the promise of freedom and dignity for every human being.

We believe in a generous America, in a compassionate America, in a tolerant America open to the dreams of an immigrant's daughter who studies in our schools and pledges to our flag to the young boy on the south side of Chicago who sees a life beyond the nearest street corner to the furniture worker's child in North Carolina who wants to become a doctor or a scientist, an engineer or an entrepreneur, a diplomat or even a president.

That's the future we hope for.

That's the vision we share. That's where we need to go – forward. That's where we need to go.

Now, we will disagree, sometimes fiercely, about how to get there. As it has for more than two centuries, progress will come in fits and starts. It's not always a straight line. It's not always a smooth path. By itself, the recognition that we have common hopes and dreams won't end all the gridlock, resolve all our problems or substitute for the painstaking work of building consensus and making the difficult compromises needed to move this country forward.

But that common bond is where we must begin. Our economy is recovering. A decade of war is ending. A long campaign is now over. And whether I earned your vote or not, I have listened to you. I have learned from you. And you've made me a better president. And with your stories and your struggles, I return to the White House more determined and more inspired than ever about the work there is to do and the future that lies ahead.

Tonight you voted for action, not politics as usual. You elected us to focus on your jobs, not ours.

And in the coming weeks and months, I am looking forward to reaching out and working with leaders of both parties to meet the challenges we can only solve together – reducing our deficit, reforming our tax code, fixing our immigration system, freeing ourselves from foreign oil. We've got more work to do.

But that doesn't mean your work is done. The role of citizens in our democracy does not end with your vote. America's never been about what can be done for us; it's about what can be done by us together, through the hard and frustrating but necessary work of self-government.

That's the principle we were founded on.
This country has more wealth than any nation, but that's not what makes us rich. We have the most powerful military in history, but that's not what makes us strong. Our university, our culture are all the envy of the world, but that's not what keeps the world coming to our shores. What makes America exceptional are the bonds that hold together the most diverse nation on Earth, the belief that our destiny is shared that this country only works when we accept certain obligations to one another and to future generations, so that the freedom which so many Americans have fought for and died for come with responsibilities as well as rights, and among those are love and charity and duty and patriotism. That's what makes America great. I am hopeful tonight because I have seen this spirit at work in America. I've seen it in the family business whose owners would rather cut their own pay than lay off their neighbors and in the workers who would rather cut back their hours than see a friend lose a job. I've seen it in the soldiers who re-enlist after losing a limb and in those Seals who charged up the stairs into darkness and danger because they knew there was a buddy behind them watching their back. (Cheers, applause.) I've seen it on the shores of New Jersey and New York, where leaders from every party and level of government have swept aside their differences to help a community rebuild from the wreckage of a terrible storm. And I saw it just the other day in Mentor, Ohio, where a father told the story of his eight-year-old daughter whose long battle with leukemia nearly cost their family everything had it not been for healthcare reform passing just a few months before the insurance company was about to stop paying for her care I had an opportunity to not just talk to the father but meet this incredible daughter of his. And when he spoke to the crowd, listening to that father's story, every parent in that room had tears in their eyes because we knew that little girl could be our own. And I know that every American wants her future to be just as bright. That's who we are. That's the country I'm so proud to lead as your president. And tonight, despite all the hardship we've been through, despite all the frustrations of Washington, I've never been more hopeful about our future. I have never been more hopeful about America. And I ask you to sustain that hope. [Audience member: "We got your back, Mr President!"] I'm not talking about blind optimism, the kind of hope that just ignores the enormity of the tasks ahead or the road blocks that stand in our path. I'm not talking about the wishful idealism that allows us to just sit on the sidelines or shirk from a fight. I have always believed that hope is that stubborn thing inside us that insists, despite all the evidence to the contrary,
that something better awaits us so long as we have the courage to keep reaching, to keep working, to keep fighting.

America, I believe we can build on the progress we've made and continue to fight for new jobs and new opportunities and new security for the middle class. I believe we can keep the promise of our founding, the idea that if you're willing to work hard, it doesn't matter who you are or where you come from or what you look like or where you love. It doesn't matter whether you're black or white or Hispanic or Asian or Native American or young or old or rich or poor, abled, disabled, gay or straight. You can make it here in America if you're willing to try.

I believe we can seize this future together because we are not as divided as our politics suggests. We're not as cynical as the pundits believe. We are greater than the sum of our individual ambitions and we remain more than a collection of red states and blue states. We are, and forever will be, the United States of America.

And together, with your help and God's grace, we will continue our journey forward and remind the world just why it is that we live in the greatest nation on earth. Thank you, America. God bless you. God bless these United States.
Appendix II
ANTONIO VIVALDI

KONZERT

a-Moll / A minor
für Violine, Streicher und Basso continuo
for Violin, Strings and Basso continuo
aus / from
»L'estro armonico«
op. 3 No. 6 / RV 356

Herausgegeben von / Edited by
Ferdinand Küchler

Ausgabe für Violine und Klavier von / Edition for Violin and Piano by
Paul Klengel

SICHERHEIT DES VERLAGERS - ALLE RECHTE VORBEHALTEN
ALL RIGHTS RESERVED

C. F. PETERS
FRANKFURT/M. · LEIPZIG · LONDON · NEW YORK
ANTONIO VIVALDI, né en 1630 à Venise est mort dans cette ville en 1743, ou il fut Directeur de l'École de Musique «Pio Ospitale della Pietà». Il nous a laissé plus de 100 concertos pour violon qui représentèrent, durant plusieurs décades et même au delà des frontières d'Italie, la forme du concerto. Un génie comme Johann Sebastian Bach, tout en en augmentant le mérite, a même transcrit quelques-unes de ces œuvres pour le clavecin et l’orgue.

La partie de violon solo, dans la présente édition, est une copie exacte de l'édition anglaise publiée par Walsh au 18ème siècle, dont on a gardé presque tous les mêmes coups d'archet. Au lago, Vivaldi, par dérogation à l'usage de son époque, ne fait pas participer le clavecin avec basse claquée, mais il fait accompagner les parties principales par les violons écrits à 3 parties et les violons. Dans la première édition le «Canabile» était la seule indication donnée pour l'exécution de ce mouvement. Tous les signes d'exécution, introduits ou indiqués par l'éditeur, sont mis entre parenthèses.
KONZERT
für Violine, Streicher und Basso continuo

Antonio Vivaldi (1678-1741) op. 3 Nr. 6 (PV 1)
Herausgegeben von Ferdinand Küchler
Klavierauszug von Paul Klengel
VIOLINKONZERTE

Ausgaben für Violine und Klavier / Editions for Violin and Piano

BACH, J. S. Konzert Nr. 1 a-Moll BWV 1041
(D. Oistrach) EP 9362
Konzert Nr. 2 F-Dur BWV 1042 (Strad) EP 4939
Konzert g-Moll BWV 1056 (Segovia) EP 9366
Doppelsatz d-Moll BWV 1043 (D. Oistrach) EP 9332

BEETHOVEN Konzert D-Dur op. 61 (Flesch)
mit Kadem 2. Kl. EP 189
Romantik op. 40, 50 (L. Oistrach/Techen) EP 9171

BERLIOZ Konzert 1 D-Dur op. 16 EP 2989a
Konzert 2 a-Moll op. 32 EP 5959b
Konzert Nr. 3 a-Moll op. 104 EP 2989d

BRAHMS Konzert D-Dur op. 77 (Klingler)
mit Kadem vom Herausgeber EP 3983

BRUCH Konzert g-Moll op. 26 (Stross/Soldán)
- Neuausgabe (Menuhin) EP 1944a

CUI Suite concertante op. 23 Bel 502

GIONNOCHI Konzert Nr. 4 A-Dur (Leber-
man/Feldgass) EP 5922

GLASUNOW Konzert a-Moll op. 82 Bel 195
Mazurka oberon Bel 496

HAYDN Konzert C-Dur Hob. Vla. II (Flesch)
mit Kadem vom Herausgeber EP 4122
Konzert G-Dur Hob. Vla. II (Küchler) EP 4182

KABALEWSKI Konzert C op. 46 EP 4618

KREUTZER Konzert Nr. 14 A-Dur (Herrmann) EP 1091b

LALO Symphonie espagnole op. 21 (Menuhin) EP 3797a

MENDELSSOHN Konzert e-Moll op. 64 (L. Oistrach)
EP 1731
Konzert d-Moll (1822) (Menuhin) EP 4670

MOZART Konzert 1 B-Dur KV 207 (Jacobst)
EP 2193a
Konzert 2 D-Dur KV 211 (Küchler) EP 2193f
Konzert 3 C-Dur KV 216 (D. Oistrach) EP 2193m
Konzert 4 D-Dur KV 218 (D. Oistrach) EP 9181
Konzert 5 A-Dur KV 219 (Marriner) EP 2193a

PAGANINI Konzert Nr. 1 D-Dur op. 6 (Stross) EP 1931

RODE Konzert Nr. 7 a-Moll (Daviionson) EP 1095c

SCHOSTAKOWITSCH Konzert Nr. 2 op. 129
(D. Oistrach) EP 5718

SCHUBERT Konzertstück D-Dur (D 435) (Jacobsen)
H 256
Rondo A-Dur (D 438) (Jacobsen) H 207

SPohr Konzert Nr. 2 d-Moll op. 2 (Davisonson) EP 1298a
Konzert Nr. 7 a-Moll op. 38 (Kochel/Thielemann) EP 8162
Konzert Nr. 8 a-Moll (Geigesatz) op. 47
(Davionson) EP 1096d

SVendsen Konzert G-Dur op. 26 (Schuster) EP 9216

TELEMANN Konzert B-Dur (Fonènd-Konzert)
(Hoffmann/Bernstein) EP 9039

TSCHIAKOWSKY Konzert D-Dur op. 35 (D. Oistrach/ Moser) EP 3294b

VIEUXTEMPS Konzert Nr. 1 E-Dur op. 10 (Arbós)
EP 3324
Konzert Nr. 2 fis-Moll op. 10 (Arbós) EP 2407
Konzert Nr. 4 d-Moll op. 31 (Arbós) EP 3322
Konzert Nr. 5 a-Moll op. 39 (Arbós) EP 3123

VIOTTI Konzert Nr. 22 e-Moll (Klingler) EP 1190a
Konzert Nr. 23 G-Dur (Daviionson) EP 1152b

VIVALDI Die Jahreszeiten, op. 8/1-4 (Kolinski)
Nr. 1 Der Frühlings (RV 169) EP 9956a
Nr. 2 Der Sommers (RV 315) EP 9555b
Nr. 3 Der Herbstes (RV 293) EP 9356
Nr. 4 Der Winters (RV 297) EP 9956d
Konzert a-Moll op. 3/6 RV 356 (Küchler) EP 3794
Konzert B-Dur (Rebekhorn) RV 353 (Franke) EP 9139
Konzert d-Moll RV 237 (Heller/Bernstein) EP 9463a
Konzert d-Moll RV 245 (Franke) EP 9558
Konzert E-Dur op. 3/12 RV 265 (Küchler) EP 4379
Konzert G-Dur op. 3/5 RV 312 (Heller/Gerlach) EP 9853a
Konzert G-Dur op. 7/3 RV 299 (Techen) EP 9838a
Konzert A-Dur RV 340 (Wieniawski-Konzert) EP 4207

WIENIAWSKI Konzert Nr. 2 d-Moll op. 22 EP 3926

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77

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