MICROTONES ACCORDING TO AUGUSTINE

NEUMES, SEMIOTICS AND RHETORIC
IN ROMANO-FRANKISH LITURGICAL CHANT

Volume I

Text

Leo A. J. Lousberg

For my grandchildren

Cover: Saint Augustine (aquarelle by Carlo Tabanelli, end of 19th century. After the 6th- century fresco from the Basilica of St. John Lateran, Rome). Collection Kunsthistorisch Instituut Universiteit Utrecht.

ISBN/EAN: 978-90-829086-0-2

MICROTONES ACCORDING TO AUGUSTINE

NEUMES, SEMIOTICS AND RHETORIC IN ROMANO-FRANKISH LITURGICAL CHANT

MICROTONEN VOLGENS AUGUSTINUS

NEUMEN, SEMIOTIEK EN RETORIEK IN ROMANO-FRANKISCHE LITURGISCHE GEZANGEN

(met een samenvatting in het Nederlands)

PROEFSCHRIFT

ter verkrijging van de graad van doctor
aan de Universiteit Utrecht
op gezag van de rector magnificus,
prof. dr. H.R.B.M. Kummeling,
ingevolge het besluit van het college voor promoties
in het openbaar te verdedigen
op
woensdag 26 september 2018 des middags te 4.15 uur
door

Leo André Jacques Lousberg

geboren op 24 mei 1950
te Maastricht

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Or contact me via leolousberg@gmail.com

PREFACE

In October 2012, Dr. Bart Jaski, keeper of manuscripts at the Utrecht University Library handed me a box with some twenty notated fragments, explaining: “We do not know exactly what they are, Ike de Loos had a look at them some time ago.” Fulfilling the requirements for a course in palaeography, the following months were spent in the icy reading room of the Special Collections Department deciphering the parchment folios, some of them so faded that the letters and the notation were barely readable. At the time, I had no idea that these dusty parchments would bring me into contact with aspects of a medieval cultural tradition that would fascinate me so much that I would decide to write my doctoral thesis on the topic.

As it turned out, these fragments belonged to an Antiphonary written in the Utrecht Benedictine Abbey dedicated to St. Paul, somewhere between c1100 and c1125. The notation consists of neumes on a four-line staff. Comparing neumes, notes and images, it soon appeared that some adapted clives were identical with clives in the Utrecht Antiphonary U 406 (labelled Ult2 here). Ike de Loos identified these adapted neumes as representing quartertones, while preparing her doctoral thesis at the same university. Quartertones or microtones can be defined as intervals smaller than a semitone.

As an amateur pianist, I had never even thought about pitches in terms other than the white and black keys of the keyboard. I could only assume that the sounds associated with them resembled those of an old 78 rpm recording of Umm Kulthum, once found in my grandparents’ loft. How it got there is a musical mystery for my family, since they preferred the Strauss family and Jacques Offenbach. What puzzled me even more though was that Umm Kulthum is considered an icon of a recent oriental song culture, which in my eyes was difficult to match with what the monks sang in Utrecht, roughly a thousand years ago. Now, five years later, these observations can be put into (a new) context as will be explained below in the Introduction.

The excellent guidance and the inspiring comments by my PhD supervisors, Prof. dr. Albert Clement, Prof. dr. Stefan Kloeckner (promotores), and Dr. Marcel Zijlstra (co-promotor) were essential to the success of this project. Dr. Manuel Pedro Ferreira shared his knowledge about microtones with me and provided me with research material from his doctoral dissertation written twenty years ago about the same subject. I also wish to thank

Prof. dr. Erik Kwakkel for his palaeographical advice about the sources consulted and Prof. dr. Els Rose, who scraped away some rusty layers of my Latin. I have been inspired and enthused by the regular – what I would call semi-professional – encounters with Dr. Paul van Emmerik that will continue after this project, I hope. Dr. Noelle Heber corrected meticulously the English language in my final drafts.

I thought it of essence that all relevant material from the sources consulted would be readily available and accessible via the digital annexes of this study. At the start of my analysis, three sources out of seven were already available online; the remaining sources were digitised during this project. I am much obliged to Diplom-Archivarin Eva Hürtgen (Domarchiv Aachen), and to Mr. Peter van den Held (Museum Catharijneconvent Utrecht), for allowing me to digitise the manuscripts Aachen G 13 and ABM h62 respectively. I thank Dr. Claire Bray (British Library), and Mrs. Tuija Ainonen MA (Polonsky Foundation), for organising and financing the digitisation of the Stavelot Missals BL Add 18031/2, following my explanation and request. Mag. Peter Zerlauth (Universitäts- und Landesbibliothek Tirol) provided me with the digital copies of ULB Tirol Cod. 144. This codex appeared to include a baffling late-thirteenth-century prologue to the Song of Songs, providing links between the employment of microtones and biblical exegesis. And what a joy it was to prepare the last steps for the public defense of this PhD thesis with Drs. Aart Veenbrink and Dr. Eliane Fankhauser. Aart was my first friend at Amsterdam University in 1969 and Eliane was my last and highly esteemed friend as a student at Utrecht University some fifty years later, before – finally – deleting the ‘s’ in ‘drs.’.

To close, I would like to thank my partner Marja van Eck for her continuing support and her patience. I promise that from now on, breakfasts will no longer be disturbed by microtonal brainstorming monologues. I dedicate my PhD thesis to our grandchildren and I wish them similar enriching, exciting and joyful explorations throughout their lives.

ABBREVIATIONS

MANUSCRIPTS

Ach	Aachen, Dombibliothek MS G13
Clu	Paris, BnF, MS PA Lat 1087
Dij	Montpellier, Bibliothèque interuniversitaire, Faculté de Médicine MS H 159
Gal	Sankt-Gallen, Stiftsbibliothek, MS 359
Inn	Innsbruck Universitätsbibliothek MS 144
Sta1	London, BL add MS 18031
Sta2	London, BL add MS 18032
Ult1	Utrecht, Museum Catharijneconvent, MS ABM h 62
Ult2	Utrecht, Universiteitsbibliotheek MS U 406
Ult3	Utrecht, Universiteitsbibliotheek Hss: Hs. Fragments 4.3.

LIBRARIES

ABM	Stichting Aartsbisschoppelijk Museum, collection Museum Catharijneconvent Utrecht
BL	British Library
BnF	Bibliothèque nationale de France
ÖNB	Österreichische Nationalbibliothek
SBB	Staatsbibliothek zu Berlin
UU	Universiteitsbibliotheek Utrecht

SERIES

PM	Paléographie musicale

PRELIMINARY REMARKS ON TRANSCRIPTIONS

The transcriptions for the main text and the appendices of this thesis were prepared in Volpiano basic, a computer program developed by Fabian Weber under the supervision of David Hiley at the University of Regensburg in 2003. In this program, the letters a–p appear as pitches (A-aa) on screen / in print, but remain searchable as letter strings in the database.[1] This was the main reason to use Weber's program. The only drawback is that it misses certain refinements in the representation of musical notation that some scholars would consider important. The program does not make provision for microtonal inflections, but the combination of a flat and a natural at the positions of the enharmonic diesis replaces them in the present study. Searches in the database remain possible. An example of two microtonal inflections in Volpiano (*fig.* 1):

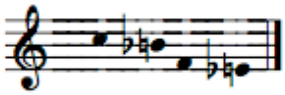

Fig. 1. Example Volpiano 1.

Sharps were inserted in Volpiano basic with the symbol (#) as on the standard keyboard. It was not optimal for database searches but given the limited number of cases in the sample, this method appeared to be sufficient (*fig.* 2).

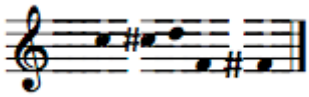

Fig. 2. Example Volpiano 2.

The microtonal enharmonic inflections do not belong to the standard concept of West-European music. There are no clear indications of how or when exactly these pitches became incorporated in the medieval traditions analysed here. Apart from the fact that

[1] Letter notations applying these letters (representing different pitch ranges) appear in medieval sources since Boethius listed them in his De institutione musica, iv.17.

monochord instructions for finding enharmonic microtones clearly have a Greek theoretical background, scholars have not been able to unambiguously link Greek microtonal theory with the medieval practice in north-western Europe.[2] In medieval contexts, the enharmonic microtone is interpreted as a particular high intonation of *mi*. Applying the letter e for *mi*, this would call for a modern transcription notation as, for instance, e+ or e♯. However, in the sources with neumes on a staff (the notation that was essential for the argumentation in favour of the contested existence of the microtonal performance tradition), microtonal inflections are represented as *downward* pitches linked to a preceding supersemitonal pitch, mostly *fa*, as will be explained in Chapter I.

The medieval notation by an adapted *clivis* is consistent with its performance because the notation strongly suggests that the microtonal pitches were also *performed* as such: as a pitch preceded by a supersemitonal pitch. In this study, the higher pitch of a semitonal interval is labelled 'supersemitonal'. In the practice of diatonic medieval chant the expression refers to *fa*, *do* and b^b. Non-diatonic semitonal alterations (again most frequently *fa*) in the source concerned are indicated by the *littera significativa* 's' (for *sursum*, Latin for 'higher').

In my PhD thesis, I chose to follow the visual impression of the main sources consulted: a microtonal inflection as a downward alteration from a diatonic pitch *∂*-, and a chromatic alteration as *∂*+, e.g. F*∂*- and F*∂*+ respectively. There may be good reason to object to this decision as conceptually wrong because it is not in line with Greek theory and may not reflect some regional notational concepts. However, I have several counter arguments. First, scholars agree that during the Middle Ages, Greek theory was not a consideration. Second, by linking the non-diatonic variants to *fa,* this choice reflects the central role of the 'tetrachord environment' of these non-diatonic pitches. Third, they are in line with the visual impression that neumes on a staff transmit.

[2] Bent *et al.* n.d.

INTRODUCTION

In Europe, microtones – intervals smaller than a semitone – have been associated with oriental cultures. The idea that these 'Arabic sounds', notated in medieval liturgical manuscripts, could be part of Gregorian chant, the 'foundation of Western (Christian) music', has been too shocking for many to accept. After a manuscript assumingly containing symbols representing these microtones was discovered in France around the middle of the nineteenth century, the initial reactions by those who rejected the idea referred to them even as "the meowing sounds of Arab music". During the twentieth century, the pejorative language gradually subsided for more politically correct terminologies, but in the analysis of liturgical chant it remained a phenomenon of peripheral concern. Microtones, if acknowledged, were considered odd sounds or 'mere embellishments'. Unsatisfied with these explanations, I kept wondering *why* these 'Arabic sounds' had been popular for so long, because even a discursive look at the available literature reveals that microtones have been mentioned for centuries and were constantly referred to as 'complicated'.

To frame the context, I will start by pointing to some diverging opinions about the meaning of these special signs or adapted neumes in medieval manuscripts. Musicologists agree implicitly on the existence of a category of special signs that presumably represent the same sonic phenomenon, but they disagree about the exact sound to which the signs refer: non-diatonic pitches or the prolongation of a diatonic pitch. The majority of scholars who wrote about this subject agree that the signs in question represent microtonal intervals. Paradoxically, for the argumentation in this thesis, the interpretation of precisely *which* sonic effect(s) the special signs and the adapted neumes represent is actually secondary: it is the system of a recurring notated sonic phenomenon that defines its functional aspect, not the sound as such, as will be explained. Nevertheless, additional observations presented in Chapter I support the microtonal argument, and my deductions from the findings assume a microtonal meaning of the special signs and the adapted neumes.

Initially an oral tradition, the written transmission of chant started during the first half of the ninth century in Carolingian monasteries. If certain *litterae significativae* may represent microtones, then they are already referenced in some of the notated liturgies that have survived from the tenth century. The youngest microtones encountered thus far date from the first quarter of the thirteenth century. If we turn to treatises and chronicles,

microtones are referred to as "(too) difficult to perform" – except for highly trained specialists who can read between the lines – or as equivalents of "sweet melodies" between the fourth century (!) and 1400.

In the sung liturgy of the Christian Church, melody supports the text but *how* exactly has been the subject of a long debate. From the nineteenth century on, scholars have been interpreting melodic patterns as representing meaning. Most older models of thought are somehow related to *imitatio* – word painting – with younger encoded parallels in the Renaissance (Madrigalisms) and the Baroque (descended from the 16th, 17th, and 18th centuries in a number of *Figurenlehren*). Increasingly, it has become clear that these models are flawed in medieval chant: too frequently, examples supporting a specific interpretation were found to represent the opposite 'meaning' in other chants. A prosodic approach of liturgical melodies has found more resonance. It is based on the premise that the melodies in the tradition analysed here follow the text without explicitly linking meaning to a melodic pattern. It is essential in current scholarly restitutions of early chant.

The restitution of medieval chant started during the first half of the nineteenth century and the Benedictine Abbey of Solesmes (near Angers, France) has since then played an important role in the debates surrounding these restitutions. However, 'Solesmes' stands for a strictly diatonic interpretation of plainchant and by that stance it chronologically and effectually limits the restitution of the sung Christian liturgy to the tradition established from about the eleventh century. At that time, in his *Prologus in Antiphonarium* (first half of the eleventh century), Guido d'Arezzo successfully propagated the employment of the staff to distinguish tones and semitones (which was not possible without lines and keys).[3] By its successful introduction, a strictly diatonic tool (allowing for only *one* accidental: b-flat) stood at the centre of the written transmission. With a few exceptions, all scholarly restitutions nowadays assume this diatonic framework. Consequently, possible non-diatonic meanings of neumes representing earlier melodic traditions have been interpreted in(to) the paradigmatic framework of the diatonic mold.

The present study does not acknowledge this paradigm. Like other scholars since the mid-nineteenth-century, it questions the exclusive diatonic interpretation of certain signs. In this respect, a series of publications between 1859 and 1882 by l'Abbé Raillard alone – including 'Emploi des quarts de ton' (*Revue Archeologique* 1859) – contains

[3] d'Arezzo 1975.

enough microtonal observations for another doctoral dissertation in this field.[4] Raillard refers to microtonal parallels between the special signs applied in the famous manuscript Montpellier H 159 (here labelled Dij) and sources from northern France, southern Germany, and Switzerland that employ letters added to the notation (*litterae significativae*). However, his suggestions never received the attention they deserved from the musicological community specialising in this field.

Literature review

In recent years, the number of publicly available digitised manuscripts has grown considerably. One may hope that newly improved digital tools such as OCR (Optical Character Recognition) and OMR (Optical Music Recognition) will become available for efficiently analysing the towering content of virtual medieval libraries. Already for the shorter term, it should become a standard research practice to provide hyperlinks in digital publications to folios in these digitised sources, which are essential for argumentation, comparison, and review. The PDF version of this dissertation provides hyperlinks to the seven sources consulted for the analyses carried out in the present study. In the remainder of this Introduction, only secondary literature will be referenced; the details and contexts of the primary sources are mentioned in Chapter I and II and in their appendices.

The *status quaestionis* of microtones will be explored by focussing on the publications of three authors. In 1978, Dom Jacques Froger from Solesmes Abbey wrote an article in *Études grégoriennes,* 'Les prétendues quarts de ton dans le chant grégorien et les symboles du ms. H.159 de Montpellier' ("The so-called quartertones in Gregorian chant and the symbols of manuscript H159 from Montpellier"),[5] in which he systematically rejects all arguments in favour of a microtonal interpretation proposed by previous authors since the middle of the nineteenth century. This publication focusses on one manuscript, most often referred to by its famous siglum 'Montpellier H 159', a Tonary from Dijon, written in around 1030. An authoritative scholar at the time, Froger's opinion on the subject has been important until this day. Having rejected a microtonal interpretation, Froger tries to find the symbols' meaning, assuming melodic patterns in cadences and

[4] Raillard 1859.

[5] Froger 1978.

openings. His functional analysis failed. In their doctoral dissertations,[6] Ike de Loos (*Duitse en Nederlandse muzieknotaties in de 12e en 13e eeuw*, Utrecht University, 1996) and Manuel Pedro Ferreira (*Music at Cluny: the tradition of Gregorian chant for the proper of the mass: melodic variants and microtonal nuances*, Princeton University, 1997) disagree with Froger's rejective points of view. They present alternative views confirming microtonality, which are supported by a number of additional sources with more 'conclusive' notations than the symbols in Dij. Consequently, De Loos appropriately refers to 'microtonal inflections', an expression I will explain and predominantly apply as well.

Christian Meyer's publication *Mensura monochordi: la division du monochorde, IXe-XVe siècles* (Paris 1996) underlines the practical and pedagogical aspects of medieval monochord instructions, often considered to be *theoretical* treatises in musicological publications.[7] Many manuscripts in north-western Europe listed by Meyer include instructions for microtonal inflections; consequently, he supports the microtonal interpretation of adapted neumes and special signs. Andreas Pfisterer in his *Cantilena romana: Untersuchungen zur Überlieferung des gregorianischen Chorals* (Paderborn 2002) – whilst acknowledging the microtonal interpretation of Dij here and in the other sources presented in Ferreira's doctoral thesis – considers it to be an isolated phenomenon of peripheral concern, insignificant for transmission theories.[8] After these publications, a hesitant stance concerning the phenomenon seems to pertain and, apparently lacking systematic, functional characteristics, has never been a serious subject in restitutional considerations.

The exploratory analysis presented in Chapter II is on the one hand based upon Froger's functional approach and on the other hand recycles part of Ferreira's research covering all Mass genres. In *Medieval Liturgical Chant and Patristic Exegesis: Words and Music in the Second-Mode Tracts* (Woodbridge 2009),[9] Emma Hornby describes the characteristics of certain variant melodic phrases, which she calls "emphatic phrases". In combination with the first tentative results of my own microtonal analysis, this concept provided the breakthrough for the functional interpretation of microtonal inflections, presented in detail in Chapters II and IV. For the genre analysis, I chose to focus on the

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[6] De Loos 1996; Ferreira 1997.

[7] Meyer 1996.

[8] Pfisterer 2002.

[9] Hornby 2009.

second-mode tractus for the practical reasons explained below. The offertory would also have been a challenging genre to analyse in the present context. Rebecca Maloy's *Inside the Offertory: Aspects of Chronology and Transmission* (Oxford 2010) links many aspects of transmission referred to by Pfisterer and Hornby in the publications mentioned above. In addition, the concept of formulaic processes, introduced by Leo Treitler and adapted by Maloy, has been crucial for developing and structuring my analyses. Treitler makes a distinction between 'formula' and 'formulaic system'. In melodic contexts, formulas are standard melodic phrases with characteristic rhythmic patterns and / or series of pitches. Formulaicism then refers to a system of constraints for employing a melodic formula. Formulaicism had a central position in the creation and transmission of the earlier liturgical tradition and hypothetically, formulaic 'musemes' must have been an essential part of it.

'Museme' is a semiotic concept referring to the smallest possible musical unit with meaning. The this term is not well-known amongst musicologists. In other words, the musicological terminology related to the closer observation of the communicative issues surrounding microtonal inflections is rather inadequate. During the subsequent stages of the microtonal analysis, I became increasingly dissatisfied with the deficient or unsatisfactory musicological terminologies for this phenomenon. Via Philip Tagg's *Music's Meanings: A Modern Musicology for Non-Musos,* (New York 2013),[10] I became acquainted with semiotics. Leo Treitler, in an article from the 1970s, later revised for his book *With voice and pen: coming to know medieval song and how it was made* (Oxford; New York 2003) advocates the employment of semiotics in musicology.[11] He underlines that what had been introduced by Solesmes as 'Sémiologie grégorienne', best known by Eugène Cardine's publication under the same title (Sablé-sur-Sarthe, 1970),[12] is in fact sophisticated palaeography. However, it has little to do with the potentially wider implications of semiotics for this field. Assembling a more adequate glossary, various publications from the vast oeuvre by Charles Sanders Peirce and Umberto Eco's *A Theory of Semiotics* (Bloomington 1976) led the way to semiotics.[13] They were supplemented by ideas developed by Eero Tarasti, especially as presented in 'The Emancipation of the Sign: On the Corporeal and Gestural Meanings in Music', published in *Applied*

[10] Tagg 2013.

[11] Treitler 2003, 320ff.

[12] Cardine 1970.

[13] Peirce: various writings; Eco 1976.

Semotics/Semiotique appliqué, 2/4 (1997).[14] This PhD thesis does not include semiotic epistemological ideas developed by semioticians,[15] but rather limits the application of semiotics to the explanation of the melodic text accentuations observed.

The functionality of microtonal inflections is presented as a 'museme'. In the present thesis, the smallest museme is represented by a non-diatonic interval, the largest being an emphatic phrase of undefined length. Paraphrasing Gérard Genette's concept of paratext, introduced in his 1979 publication *Seuils*, later translated as *Paratexts: Thresholds of Interpretation* (Cambridge 2001),[16] I defined the microtonal inflection as 'parapitch', a musically defined sonic phenomenon, systematically linked to text meanings. In Peircean terms, the parapitch can be defined as an indexical signal-vehicle, by definition ('indexically') transferring *references* to meanings, to be distinguished from sign-vehicles, which convey meanings, as will be explained in Chapter III.

Gradually, it became clear that the museme functionalities of microtonal inflections and emphatic phrases seem to be identical with the functionality of liquescent notes and many modal shifts, as observed respectively by Dirk Van Betteray in *Quomodo cantabimus canticum Domini in terra aliena: Liqueszenzen als Schlüssel zur Textinterpretation, eine semiologische Untersuchung an Sankt Galler Quellen* (Hildesheim 2007) and William Mahrt in *Commixtio Modi and the Expression of Texts* (Cantus Planus Conference Dublin 2016).[17]

The analysis of shifts in the overlapping occurrences of microtonal inflections and these other melodic accentuation tools led to additional attention for transmission theories. Leading publications were Theodore Karp's *Aspects of Orality and Formularity in Gregorian Chant* (Evanston 1998) and Charles Atkinson's *The Critical Nexus: Tone-System, Mode, and Notation in Early Medieval Music* (New York 2008).[18] These publications about transmission and the specific examples they present provided the background for a contextualisation of the present findings with current transmission theories.

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[14] Tarasti 1994; Tagg 2013.

[15] Cf. Nattiez 1976.

[16] Genette 2001.

[17] Van Betteray 2007; Mahrt 2016.

[18] Karp 1998; Atkinson 2008.

Research questions

Previous discussions about microtonal inflections had a predominantly palaeographical character: to which sounds may certain special signs or adapted neumes refer and what might be their theoretical and historical backgrounds? My initial research question tried to extend the earlier functional analysis carried out by Froger, trying to find an answer to the question of which (diatonic) melodic functions could be connected to the employment of microtonal inflections ('the initial research question'). This analysis, like Froger's, did not result in any systematically convincing answers. Another research question – mentioned by Froger, but without any follow-up – centralised the relation between microtones and text: can *text elements* trigger microtonal inflections (for Froger, read: 'special signs' for microtonal inflections), and if so, how? I will refer to this research question as 'the adapted research question'.

From linguistic and ethno-musicological field studies, we know that in oral traditions, difficult textual and melodic passages tend to be replaced by easier ones, *unless* the former are functional in some way. The outcome of my research indeed seems to indicate that functional relations exist between verbal texts, rhetorical principles, and the occurrence of microtonal inflections. That made them part of a living tradition for nearly a thousand years. This raised a number of additional research questions:

- Which aspects of rhetorical canons are linked to microtonal inflections?
- Do rhetorical guidelines apply to the employment of microtonal inflections as well?
- Does a melodic grammar exist for the employment of microtonal inflections?
- Do microtones employed in Mass and the Office have the same triggering systems?
- How should one define and demarcate the respective roles of musemes and verbal text elements in the communicative processes between the source, the performer, and the audience?
- Is there a relation between microtonal inflections and other musemes observed in recent studies?
- How do musemes fit into current transmission theories?

Microtones are triggered by text and the process is channelled by rhetoric. The rediscovered concept is that words in the liturgical text are accentuated by microtones if

the scribe or the performer thinks that the word(s) deserve additional attention due to aspects of affect, logic, or *loci*. *Loci* here refers to narrative, exegetical elements in the text. The *loci* referring to psalm texts and highlighted by microtonal inflections can almost always be linked to the Church Father Augustine of Hippo (354 - 430). This explains the title of this PhD thesis, 'Microtones by Augustine'.

By using microtones, a scribe or performer could reveal what moved or convinced him / her in the related liturgical text and what he / she thought of interest to write or sing for the community. The constraining elements of melodic grammar and rhetorical guidelines are to be seen separately from the *individual* choice of an interpreter to actually employ them. My hypothesis is that this subjective *ad libitum* aspect is inherent in the employment of rhetorical tools in this context.

Significance

This PhD thesis is primarily a pilot study about the rhetorical functions of microtonal inflections, employed as a musical tool for text accentuations, which can be typified as musemes. For microtonal inflections, the rhetorical and musical constraints are defined. In addition, it contextualises the employment of a number of separate, similar medieval musemes into a coherent system, providing new leads for current restitution practices. The combined occurrence of musemes, called 'stacked musemes', leads to some tentative considerations for developing new insights in diachronic and regional aspects of transmission.

Limitations and delimitations

The tangible results of this PhD thesis are reflected in an exploratory analysis of microtonal neumes and special signs notated in the same sources consulted by Ferreira and De Loos in their doctoral theses.[19] Consequently, this thesis discusses phenomena observed in six Mass manuscripts written between Cluny in the south and Utrecht in the north from *c*1030 to 1225 and one Antiphonary, written in Utrecht around the middle of the twelfth century. Five manuscripts are notated in neumes on a staff and one manuscript has a letter notation including special signs in addition to neumes. This implies that for six of the seven

[19] The results of analyses carried out prior to the 'functional shift' in my research are only briefly mentioned and not presented in detail.

manuscripts, the distinction between tones, semitones, and microtones is well-defined. The microtonal neumes in the remaining Gradual, Paris, BnF MS lat. 1087 (labelled 'Clu') with a *campo aperto* notation are exuberant flags, which result in very distinct neumes that visually define their intervals even better than the surrounding neumes representing tonal and semitonal intervals in this source. In the PDF format of the analyses presented in Volume II, hyperlinks enable the reader to consult all cases found in the now digitised manuscripts.

The conditions of time and place situate the manuscripts consulted in the Romano-Frankish chant tradition, which is the result of the assimilation of the Roman sung liturgy into the Carolingian traditions, the former having been transmitted to the north during the eighth and the ninth centuries. Gregorian chant rather refers to the umbrella concept covering the Roman traditions, Romano-Frankish chant, the Milanese Ambrosian sung liturgy, and the Iberian Mozarabic traditions from the Middle Ages until now. Currently unaware of retraceable medieval Christian microtonal traditions elsewhere, the findings from the analyses presented in this thesis refer exclusively to the Romano-Frankish chant tradition as observed in these sources.

The conclusions for Mass are backed by a random sample covering all chant genres and additionally by an analysis of all microtonal inflections in one genre, the second-mode tractus. The combined analyses cover more than 500 microtonal inflections, presented in two appendices. The assumed functionalities were confirmed without exception. The analysis of microtonal inflections employed in the Office was carried out as an *excursus* and limited to the chants in Ult2 in which both microtones and non-diatonic semitonal musemes occur. The hypotheses covering issues of transmission including musemes analysed by others are supported by a detailed non-diatonic analysis of a limited number of examples mentioned in earlier diatonic research. Due to characteristics of the material explained in Chapter II and the absolute number of cases analysed, conclusions backed by statistical evidence are not possible at this stage; as stated above, this is a pilot study. However, the results are convincing enough to counter the assumption that microtonal inflections would be only "local, incidental intonation variants" that have nothing to do with the tradition in wider contexts.[20]

Delimitations became necessary when research, originally intended as an in-depth musical analysis of microtonal inflections in diatonic melodic contexts, turned into a trans-

[20] Pfisterer 2002, 14.

disciplinary pilot study. Without the guidance of my experienced tutors, it would have taken years to present tangible final results. My exploratory analysis relates to the sources consulted by Ferreira and De Loos. This focussed the analysis on Mass chants with an *excursus* to one Utrecht Antiphonary. It excluded other reference material introduced to the discourse, such as the publications by l'Abbé Raillard referred to above, containing references to *litterae specificativae*. Of these letters only the letter 's' was analysed, as employed in Ult2. Some of the other letters added to neumes of different regional backgrounds presumably have similar museme characteristics. Jos Smits van Waesberghe in his *Muziekgeschiedenis van de Middeleeuwen* (Tilburg 1942)[21] points out that for instance the neume letter '*e'* not only indicates a *unisono* movement as generally assumed but may possibly represent a semitone or microtonal interval as well, depending on the circumstances. Some preliminary, more or less accidental findings presented in APPENDIX VI seem to confirm his observations.

In close consultation with my PhD supervisors, I decided to refrain from analysing microtonal traces that could reveal more about medieval emotions – a favourite subject amongst my fellow-mediaevalists, with publications written by icons like Barbara Rosenwein (*Emotional Communities in the Early Middle Ages*, Ithaca, N.Y. 2006) and Martha Nussbaum (*Upheavals of Thought: The Intelligence of Emotions*, Cambridge; New York 2008).[22] The inaugural address by the Utrecht musicologist Kees Vellekoop (*Musica Movet Affectus*, Utrecht 1994) offers many introductions in this respect.[23]

Considerations about connections between microtones and the Byzantine sung liturgy had to also be set aside. Several other more recent Mediterranean traditions, about which Jean-François Goudesenne informed me *in extenso*, faced the same fate. Although I included the search results in APPENDIX VII, I had to forgo the analysis and description of the links between details of the scenes in the illustrated Utrecht Psalter (Reims, *c*830) and words accentuated by microtones in psalm texts employed in the chants analysed. The fascinating overlaps observed between the employment of microtones in medieval liturgy and the outcomes of current cognitive musicological PhD research by Yke Schotanus of this same university will have to hibernate in a footnote until a joint publication appears.

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[21] Smits van Waesberghe 1942, 506ff.

[22] Rosenwein 2006; Nussbaum 2008.

[23] Vellekoop 1994.

Structure

The study opens with a revaluation of arguments in previous studies concerning the palaeographical meanings of special signs and adapted neumes, interpreted by De Loos and Ferreira as microtonal inflections. Further, more recent supportive arguments were added, which were encountered during the preparations of the analyses presented in this thesis. Some terminology issues about the confusing dichotomy adiastematic – diastematic are discussed and the reader will find proposals for alternatives. Chapter II discusses the exploratory analysis resulting in an answer to the adapted research question which explains how text triggers microtones in a rhetorical setting. Paragraph II.6 addresses an *excursus* to the Office as notated in the Utrecht antiphonary U 406 (Ult2).

Chapter III rephrases the microtonal phenomenon in semiotic terminologies in order to apply them to the observations made in the final chapter. The dynamical steps of the semiotic process starting from the first connotative trigger to the sounding signal are dissected; the microtonal inflection is defined as an intertextual parapitch, linking verbal and melodic elements of sung liturgies.

In Chapter IV, the detailed analysis of the second-mode tractus, in addition to the highly sophisticated use of musemes, reveals the existence of a musical grammar for the employment of microtonal inflections. The comparisons between the (partly combined) utilisation of emphatic phrases and microtonal inflections uncovered diachronic shifts. They possibly reflect transmission aspects of the migration of Christian sung liturgy from Rome to the Carolingian culture north of the Alps, but it is concluded that with the current knowledge, specifications beyond ‘older’ and ‘younger’ traditions are purely speculative. The discovery of diachronic shifts in the employment of emphatic phrases triggered further analysis into other musemes, ‘stacked’ with microtonal inflections: modal shifts and liquescent notes. The analysis seems to indicate the existence of an underlying tonal framework presented in the *Scolica Enchiriadis* as described by Atkinson. An extension of the findings for Mass to the Office, for Ult2 indicates the presence of parallels with certain *litterae significativae* as employed in the Sankt Gallen manuscripts SG 390 and SG 391, two manuscripts that belong to the oldest known notated sources.

The selected examples related to ‘stacked musemes’ seem to point to traces of a common underlying approach that explains the workings of the musemes presented in this study against the background of a strictly modal and austere earlier oral performance tradition prior to what we observe in the sources analysed for this PhD thesis. Chapter IV

concludes with some tentative observations about the restitution of melodies beyond the Guidonian diatonic threshold.

CHAPTER I

THE REVALUATION OF A LOST PERFORMANCE TRADITION

In 1854, Alexandre Vincent opened the discourse about microtones in Romano-Frankish chant by raising palaeographical questions regarding the meaning of five symbols.[24] These symbols were discovered in the Tonary from Dijon, nowadays known as manuscript Montpellier, Bibliothèque interuniversitaire Faculté de Médicine H 159 ("Dij").[25] This source and relevant aspects of its notation will be introduced in paragraph I.1, followed by an explanation of why the traditional dichotomy between diastematic and adiastematic is unsatisfactory when defining characteristics of medieval notations (paragraph I.2). Paragraphs I.3 – I.6 will provide a thematic summary of arguments that occupied a central position in the discourse about the palaeographical interpretations of special signs in Dij and of adapted neumes apparently expressing the same sonic phenomena in a number of other manuscripts. The main focus of the critical review presented in this chapter relates to the arguments brought forward in the publications by three twentieth-century musicologists who prepared the way for this PhD dissertation: Jacques Froger, Ike de Loos, and Manuel Pedro Ferreira. In paragraph I.7, previous research into the central theme of this study will be discussed: the *function* of the special signs in Dij, which appear as adapted neumes in the other manuscripts analysed in this study. Froger's findings about this aspect will be discussed in combination with some introductory remarks about the role of semiotics in this context.

I.1. The Tonary of Saint Bénigne de Dijon

In 1846,[26] Félix Danjou discovered Dij; he mentioned the Tonary in the *Revue de la musique religieuse, populaire et classique*,[27] of which he was the editor. The manuscript

[24] Vincent 1854.

[25] Spelling and capitalisation of liturgical terminology as in Hughes 1995.

[26] Egeland Hansen 1974, p. 19*, fn 5. According to Hansen, when Danjou refers to "le 18 décembre dernier" in his Revue from December 1847, this can only relate to the previous year, i.e. 1846.

[27] Danjou 1845, p. 385 ff.

would come to play a central role in deciphering the notations of Romano-Frankish chant and, as such, is of paramount importance for its reconstruction, as propagated by the monks of Solesmes in their series *Paléographie musicale* from 1889 onwards. Since its discovery, an extensive, descriptive, and analytical bibliography about Dij has been developed. The manuscript presumably was written during the first third of the eleventh century for or at the Benedictine abbey dedicated to Saint-Bénigne in Dijon. According to the grouping of its content, it can be categorised as a Tonary: per liturgical genre, the chants are listed by mode.

Dij contains all of the genres from the proper of the Mass: introits, graduals, offertories, alleluias, tractus and communions. Normally, a Tonary contains only the chants' incipits; in Dij however, each chant is fully notated. Dij shows a remarkable, double notation system. Above the text, the first system consists of a letter notation indicating pitches with the letters a-p (representing the pitches A-aa), plus five special signs (*fig.* I.1).

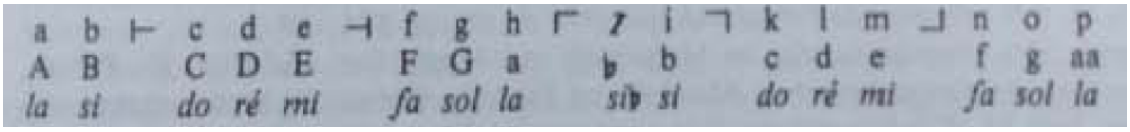

Fig. I.1. The letter notation and the special signs.[28]

The second notation system is a row of heighted neumes without lines from the Franco-Burgundian notation (*fig.* I.2).[29] Only a few manuscripts from the eleventh century share this double notation; however, none has an equivalent for the five special signs.

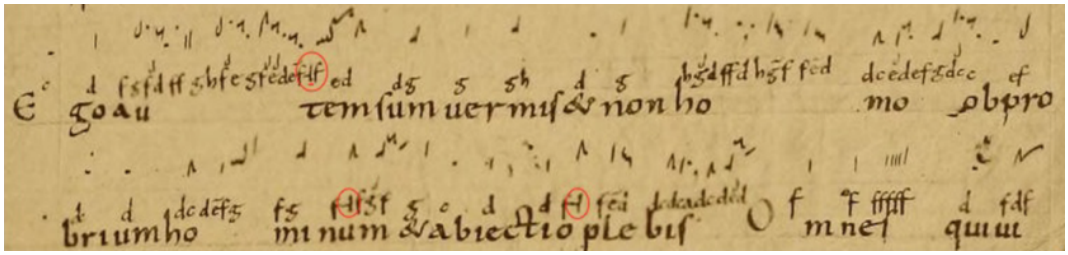

Fig. I.2. Dij PM 8, 301, *Ego autem sum vermis* with three special signs.

[28] Froger 1978, 145.

[29] Huglo and Ferreira n.d.

I.2. ‘Diastematic’ and ‘Adiastematic’ Notations

The musicological terms ‘diastematic’ and ‘adiastematic’ appear to ambiguously overlap.[30] They falsely suggest a clear-cut division between notations that respectively reflect exact intervals and those that lack this information. Below are some examples of different interpretations as seen in handbooks and encyclopaedias followed by an adapted categorisation and an alternative terminology.

In his study *Medieval Music*, Richard Hoppin introduces diastematic notation as

> […] heighted neumes, which indicate by their placement the size as well as the direction of individual intervals. For this reason, notation with heighted neumes is often called diastematic, from the Greek word for interval.[31]

For Hoppin, heighted neumes imply the absence of lines, but without lines it is not possible to distinguish between tones and semitones.[32] The same applies to the definition of pitch sequences between neumes; in most cases, the notation gives no information about the interval between the last pitch of a neume and the first pitch of the subsequent neume. So, here, ‘indicate’ is not ‘define’.

Anthony Pryer limits the term diastematic to staffless notations, but at the same time, links it to ‘relative pitch’, an expression other authors reserve for neumes on lines:

> A type of early plainchant notation used before the invention of the staff. The dots and squiggles (‘neumes’ […]) were arranged carefully in relation to each other so as to show their relative pitch. Occasionally the pitches were further clarified by the addition of a faintly scratched line representing the final note of the modal scale in which the chant was written. Neumes written without any attempt to show relative pitch are known as ‘adiastematic’.[33]

In the same encyclopaedia, instead of a definition, David Hiley gives a range of possible interpretations for ‘diastematic’:

> An adjective describing notation that indicates the pitch of notes by their vertical placing on the page. […] The term is usually applied to neumatic notations written in campo

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[30] See also: Treitler 2003, 340, fn. 40

[31] Hoppin 1978, 59.

[32] Except for some notations in which specific neumes may indicate the position of a semitone, like the quilisma in the Graduale Albiense, BnF Lat 776.

[33] Pryer n.d.

> aperto (in a space without ruled horizontal lines) although, from its etymology, it could also be used to describe notation on dry-point, black or coloured lines.[34]

In his handbook *Western Plainchant,* Hiley seems to reserve the terminology for notations reflecting exact pitches.[35] For Richard Taruskin, diastematic notation is strictly linked to the staff:

> To read a previously unknown melody at sight, one needs at a minimum a means of precise intervallic (or relative-pitch) measurement. It was not until the early eleventh century that neumes were 'heighted,' or arranged diastematically, on the lines and spaces of a cleffed staff. [36]

The latter addition makes a clear distinction for interpreting exact intervals from notation. But in Taruskin's definition, for the present study, the adiastematic qualities of the remaining Western medieval notations need more specification.

It can be concluded that the definitions of diastematic and adiastematic notations as presented above suggest a demarcation between notations by which it is possible to distinguish tones and semitones at sight and those by which the tone-semitone distinction is less evident. As only cleffed staffs define the exact positions of tones and semitones (with a few exceptions), most definitions refer to overlapping categories of notations in a puzzling manner. For the purpose of the present discussion, the distinctions between different early music notations have been insufficiently defined.

I will distinguish four neume categories, starting with *neumes on a staff* (1) as defined by Taruskin. The introduction of manuscripts with these characteristics by De Loos and Ferreira has been of essence for the re-assessment of earlier interpretations of the Dij special signs. *Heighted neumes on lines* (2) are signs written on line systems that provide less information than a staff; clefs may be lacking, but the line(s) normally indicate(s) semitonal positions. Experienced singers could read the notation as if it were written on a staff. Some essential information in this category may at times be lacking for an academic analysis of pitches. The third category encompasses *heighted neumes without lines* (3) and the fourth category the *unheighted neumes* (4). *In campo aperto* is a shared

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[34] Hiley n.d.

[35] Hiley 1993, 373

[36] Taruskin n.d.

characteristic of the last two categories. The dichotomy between diastematic and adiastematic may at first glance appear to be more attractive for the discourse; however, its attractiveness disregards essential distinctions.

I.3. The Meaning of the Special Signs

By categorically rejecting all arguments that might indicate the existence of microtonality in Romano-Frankish chant, Dom Jacques Froger, in 1978, sought to put an end to the discourse about microtonality that had started in 1854.[37] Froger's rejection of microtonality in medieval Romano-Frankish chant reverberates in publications to this day.[38] Still, authors are reluctant to mention microtones without the epithet "presumed"; some present their analyses as if the new insights gained after 1978 do not exist. Froger's own tentative explanations for the special signs indicating longer durations of diatonic pitches have not found much acceptance.

For the discourse on microtonality in relation to Froger's arguments, the years 1996 and 1997 were important because several younger sources with neumes on a staff were introduced to the debate. The notation in these manuscripts has added a new layer of semiotic material that had not previously been taken into consideration. Ike de Loos, amongst others, analysed the notation as it appears in the Missal ABM h62 (Ult1) and the Antiphonary U 406 (Ult2) in her doctoral dissertation.[39] In 1997, Manuel Pedro Ferreira

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[37] Froger's critique in 1978 referred to publications between 1854 and 1911, the year in which Josef Gmelch published his dissertation (mentioned below). After Gmelch, there have been no essential new points of view according to Froger ("Les auteurs postérieur á Gmelch n'apportent rien de bien nouveau" Froger 1978, 150). Manuel Pedro Ferreira in his dissertation (1996, 16) refers to thirteen authors between 1911 and 1974 who accepted the occurrence of intervals smaller than a semitone on medieval chant notations. In essence, Froger is right about their contribution to the discourse. Between 1978 and 1996, nine more publications addressed the phenomenon, of which three shed new light: Ike de Loos (1996), Manuel Pedro Ferreira (1997), and Christian Meyer's standard work on the monochord (1996), discussed in more detail below.

[38] Froger 1978.

[39] De Loos 1996. De Loos's thesis focuses on characteristics of the notation in a number of manuscripts written in places now situated in The Netherlands and Germany. Common characteristics in the neumes resulted in a narrower definition of Jos Smits Van Waesberghe's 'Rhine-Meuse neumes' to 'Utrecht-Stavelot-Trier neumes', mainly based upon an angular pes and a more vertical ductus. The notation in the Antiphonary U 406,

earned his doctoral degree with a PhD thesis on aspects of the Cluniac liturgy, including an analysis of the Gradual Clu.[40] Both scholars have confirmative views on the occurrence of microtonality in Romano-Frankish chant, with which I agree. In the following pages, I will introduce the issues that are central in the discourse between Froger and his younger antagonists (theory, performability, and palaeography) in paragraphs I.3.1.-I.3.3., followed by the arguments brought forward thereafter (the monochord and contemporary reception) in paragraphs I.4.-I.5.

I.3.1. Theoretical Considerations

Greek Theory

Since the discovery of the five special signs, most musicologists agree that these signs either represent,[41] or (at least) serve as reminders of the microtonal interval diesis in positions where classical Greek music theory, describing the enharmonic genus, allows for these intervals.[42] The enharmonic genus is one of the three characteristic tunings of the Greek four-stringed lyre, of which the two outer strings are always a fourth apart. The (variable) tuning of the two inner strings of the tetrachord defines the genus, of which there are three groups:[43] enharmonic, chromatic, and diatonic (*table* I.1.).[44]

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kept in the Utrecht University library, has a prominent position in her dissertation.

[40] Ferreira 1997. Ferreira analyses the sung liturgy as performed in the Benedictine abbey of Cluny. An overview of the (few) remaining sources and a review of their notation and melodic content led to an extensive analysis of the Cluny gradual BnF Lat. 1087 ("Clu"), containing heighted neumes without lines that have microtonal implications (a special clivis and torculus) as already referred to in 1852 by Abbé Raillard. Microtonality, according to Ferreira, was part of the eleventh-century sung liturgy in Europe's largest Benedictine monastery at the time.

[41] Ferreira (*Ibid.*,168, 224f.) lists the publications about microtonality since 1854. Twenty-eight authors accept microtones in full, three accept with some conditional remarks, nine are neutral or ignore it, and three authors reject the phenomenon: Raffaello Baralli (1911), Albert-Jacques Bescond (1972), and Jacques Froger (1978).

[42] Ferreira *Ibid.*, 158.

[43] Greek theory knows many tunings for the tetrachord, but they can be grouped according to the principles described here.

[44] This is a schematic and approximate representation of proportions without intending to reflect physical measurements.

Genus	Intervals			
Diatonic	ST		T	T
Enharmonic	QT	QT	2T	
Chromatic	ST		ST	3/2 T

Table I.1. Diagram with possible constellations of genera intervals in the tetrachord. Grey cells indicate the pyknon.

If the combination of the lowest and second lowest interval together is smaller than the highest interval within the fourth, the combination is named a *pyknon*.[45] The tunings of the chromatic genus and the enharmonic genus are characterised by different *pyknons*. If the *pyknon* has the interval of about a whole tone, the genus is chromatic. Each pitch of the chromatic *pyknon* is about a semitone. If the total *pyknon* has the interval of about a semitone, the two constituent pitches are about a quartertone each, characteristic of the enharmonic genus. The Greek name for this pitch is *diesis* and is mentioned as such in medieval treatises.

As the calculation systems defining genera vary, the diesis is not an absolute interval, but an interval 'smaller than a semitone'. For Guido d'Arezzo (*c*995-1034) for instance, the diesis reflects a 28:27 interval, which is about 63 cents, or 3/10 of a tone.[46] In the text below, 'diesis', 'microtones', and 'microtonal intervals' refer to the same interval.[47] In the text, microtonal inflections can be referred to by their supersemitonal pitch with the suffix δ-. As will be shown in Chapter II, the medieval notation practice in Ult2 may *raise* a (mostly) supersemitonal pitch by a semitone by adding the *littera significativa 's'*, for *sursum*, 'higher' to (or above) a pitch. These intervals will be represented as their lower semitonal pitch and the suffix ∂+: C, F (occasionally g) ∂+.
In solmisation terms, in principle, dieses are positioned between *fa* and *mi*. Applied to the lettering in Dij, this implies that dieses may occur between c-b, f-e, k-i and n-m. Drifting

[45] If the combination of the two lower intervals within the tetrachord is not smaller than the first interval, the resulting genus is called a pyknon. This applies to the diatonic genus.

[46] For this proportion, Ferreira refers to analyses by Vincent, Schlecht, Hermesdorff and Gevaert of the Interpolation in Chapter X of Guido's Micrologus, paragraph (i). Ferreira1997, 202.

[47] Many musicologists disagree about calling the diesis a quartertone, as it is not exactly a quartertone in the mathematical sense. For Pythagorean medieval semitones, the same applies, although no one seems to care about that.

away from Greek theory, in Dij – and in the other medieval manuscripts analysed in this study – the diesis may occur in each situation where Romano-Frankish chant allows for a supersemitone; this means that it can also occur between b^b ('*i*', an 'i' written in italic in Dij) and a ('h' in Dij). In *fig*. I.3, the upper diagram refers to this Romano-Frankish employment of the microtone. In short, there are five microtones in the Romano-Frankish gamut, which will be referred to as: Cδ-, Fδ-, b_bδ-, cδ- and fδ-.

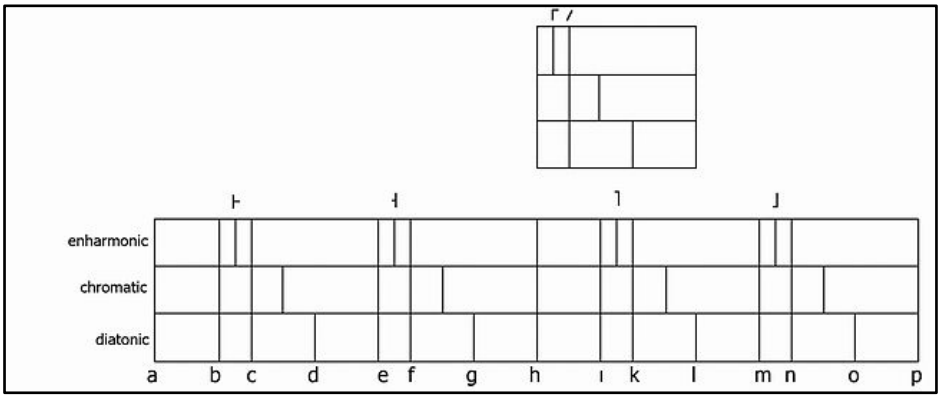

Fig. I.3. The intervals of the three Greek genera as applied in the Romano-Frankish *gamut.*[48]

In the Romano-Frankish gamut, b^b occurs in only one position as does the diesis immediately below it. As the flattened b is not a pitch in Greek theory, the medieval diesis connected to it is supposedly from a later date.

I.3.2. Late Classical and Medieval Theory

As for the late classical and medieval treatises, Froger's rejective argumentation relies predominantly upon references to medieval theoretical works. In paragraphs G and H of his article, he analyses whether medieval theorists allowed for the employment of other genera than the diatonic in chant. After having quoted from seven treatises,[49] Froger concludes that from the most ancient medieval theories up to the fourteenth century, only the diatonic genus was in use with exclusion of the enharmonic and the chromatic genus.

[48] According to a diagram as reproduced in Meyer 1996.

[49] Remigius of Auxerre, Anonymous I, II (Gerbert), Aurelius of Reome, Alia Musica, Henry of Augsburg and Jean de Muris.

He quotes Anonymus I (Gerbert) and Henry of Augsburg (d.1063) who mention that the enharmonic genus is no longer applied in ecclesiastical use because it is too difficult.[50] Somewhat surprisingly, Froger categorises these as implicit confirmations that the enharmonic genus was not applied *at all* in medieval chant.[51]

Froger summarises the extensive academic discussion about the interpolation of Chapter X in Guido d'Arezzo's *Micrologus*. In the first half of the eleventh century, Guido wrote his *Micrologus* against the background of the earlier propagation of the staff in *Prologus in Antiphonarium* as an improved tool for learning diatonic chant 'by the book'. Froger agrees with Raffaello Baralli that the interpolator,[52] if not Guido d'Arezzo himself, must have been a knowledgeable theorist.

Based upon Jos Smits Van Waesberghe's edition of the text,[53] Froger admits that the author refers to 'admissible' dieses, the conditions explained in the interpolation by an example of the melody on the word *Desiderium*, from the first verse of the first-mode gradual *Posuisti Domine super caput*. Froger reviews opinions in the musicological discussion about this example, but considers the text to be misinterpreted by all, as the anonymous author of the interpolation describing the diesis does not refer to a microtone, but to an admissible, although faulty intonation of the minor third in the first modus.[54] Quoting Baralli, Froger states that it would be wrong to see a confirmation of microtonal performance practices in the interpolation.[55]

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[50] Not mentioned in the discussion are the late-classical comments on the genera by Aristides Quintilianus (not to be confounded with the rhetorician Marcus Fabius Quintilianus, c35 – c100) who presumably lived c350CE: "Of these [genera], the diatonic is the more natural, for it is singable by everyone, even by those altogether uneducated. The color (meant is the chromatic genus, LL) is the more artistic, for it is sung only by men of education; and the enharmonic is the more precise, for it has gained approval by those most distinguished in music; but for the multitude, it is impossible." See: Atkinson 2008, 11.

[51] Froger 1978, 168.

[52] Baralli 1911.

[53] Guido and Smits van Waesberghe 1955.

[54] Froger 1978, 162: Vincent "fait de l'acrobatie". Idem, 163: Fraselle and Germain have explanations "extrèmement alambiquées". Nisard applies a "base fausse".

[55] *Ibid.*, 166.

De Loos briefly touches upon Greek and medieval tonal theories.[56] She cites Hucbald's (*c*840-930) *De harmonica institutione*,[57] where he refers to the difference between the wider and the narrower semitone. Regino of Prüm (*c*842-915) mentions intervals smaller than a semitone, but relates these to *musica artificialis,* or instrumental music. For vocal music, *musica naturalis*, these smaller intervals do not apply according to Regino's treatise. De Loos mentions the interpolation in Chapter X in Guido's *Micrologus*, but refrains from further comments as it might be not authentic.[58] In her dissertation, she does not spend much attention on Froger's extensive objections against the microtonal interpretation of the special signs in Dij and his subsequent denial of the employment of dieses in medieval chant: one sentence to be exact. Referring to Froger's tentative explanation of the special signs as representing duration, she states:

> De ideeën van Froger kunnen verworpen worden: alleen al het feit dat de speciale symbolen [...] in de letternotatie staan, die puur melodisch is, sluit een ritmische interpretatie uit.[59]
>
> [Froger's ideas can be rejected: the mere fact that the special symbols […] are in the letter notation, which is purely melodic, excludes a rhythmic interpretation.]

Ferreira summarises Greek theories and the way in which they were applied in medieval theory and in practice.[60] After an introduction in which he points to the long-lasting influence of Hellenic culture in the Christian Western world,[61] he mainly focuses on theories by Aristoxenos (**c*370 BCE) and Ptolemy (**c*100 CE) about the Greek genera including microtones. These were well-known to medieval theorists, with Boethius (480-524 CE) being the main link between classic theory and the middle ages. He transmitted the theories of Aristoxenos and Archytas (first half of 4th century BCE) to his own times.

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[56] De Loos 1996, 179ff.

[57] Gerbert 1931, 103ff.

[58] De Loos 1996, 181.

[59] *Ibid.*, 188.

[60] Ferreira 1997, 179-181.

[61] *Ibid.*, 175: Guido d'Arezzo mentions Greek music teachers in his time. In note 76, Ferreira refers to sources mentioning Greek monks as cantors in basilicas and Syrian singers in a number of Italian towns.

His *De institutione musica* was of eminent importance for the development of medieval music theory.

In spite of an enumeration of some twenty-three medieval authors and anonymous treatises, with fifteen mentioning the enharmonic microtone as diesis or quartertone [*sic*] and only three the chromatic diesis (as a third of a tone),[62] there are no direct theoretical references to microtones as applied in medieval liturgical chant. Ferreira's paragraph reviewing the Greek and medieval theory ends without evident theoretical links to (medieval) microtonal chant. Ferreira emphasises the positive contribution to the microtonal concept by the interpolation in Chapter X of Guido d'Arezzo's *Micrologus*. Ferreira's final conclusion is that the interpolator allows for the employment of the diesis as the enharmonic interval situated between F and E, when sung after an A.[63]

The comments on medieval theories concerning microtonality, the enharmonic genus, and dieses by these three authors and by musicologists who preceded them do not constitute the necessity to consistently re-interpret 'practical' medieval microtonality. The medieval treatises quoted in the microtonal discourse were written at times when the vocabulary of music was under development. Often, tentatively formulating musical terminologies mainly based upon late-classical treatises, the medieval texts are vague and inconsistent. It should not be a surprise that large distances and chronological gaps of up to several centuries have resulted in a collection of treatises and chronicles that contradict each other. Under these circumstances, it seems illusory to construct arborescent analyses that represent a linear evolution. Lacking more information, it seems doubtful to assume common, identical theoretical principles underlying both classical Greek and medieval performances.

In the diatonic context of Guido's *Micrologus*, the interpolation in Chapter X is remarkable. Why is so much attention paid to the employment of dieses – microtones – in a treatise focussing on the correct employment of tones and semitones? The interpolator / Guido could have rejected the use of the diesis in one sentence, but apparently things were more complicated, an observation that Froger does not take into consideration. The musicological debate about the text of the interpolation has proven to be too vague at essential points. The terminology applied by the interpolator has resulted in a complete chaos of different interpretations of expressions for intervals and pitches, to which dieses

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[62] Ferreira 1997, 180.

[63] *Ibid.*, 216.

are linked. In discussions since the nineteenth century, the tonal movement towards the diesis (*subductio*), for instance, has been translated as 'subtraction' and 'elevation'. Wherever it suited the line of reasoning, diesis has been translated as 'quartertone' or 'minor semitone' and Latin expressions for intervals have been interpreted as 'indicating modes'. In the end, one faces diverse argumentations starting with fluctuating underlying pitches and followed by various intervals within different modes and contrary directions arriving at an assumed diesis, which some musicologists have categorised as a 'minor semitone'. The treatise becomes of secondary importance in the light of other arguments concerning the employment of microtones in medieval chant, which will be discussed in the next chapters of this study.

I.3.2. Performability

Froger is convinced that medieval singers were not able to sing microtonal inflections. He refers to Boethius and four medieval treatises, including the interpolation in Guido's *Micrologus* discussed above. These sources confirm the audible difference between a semitone and closer intervals, such as dieses and commas.[64] He then turns to Hucbald's *De harmonica institutione* in which the author repeatedly states that the semitone is an extremely close interval, hardly discernible by human ears. This leads Froger to the conclusion that if trained singers in Hucbald's time found semitonal intervals so difficult to distinguish from wider intervals, even smaller intervals must have been impossible for them to perform. He concludes paragraph I with a reference to his Solesmes colleague, Albert-Jacques Bescond, who states that in Dij, notation consisting of letters and special signs cannot represent microtonal intervals, as they would have been impossible to sing.[65]

Froger's Eurocentric judgment on singing intervals smaller than a semitone completely bypasses traditions in places as geographically close as North Africa and Turkey. One might also assume that Froger could have been aware of the performances of twentieth-century microtonal vocal compositions in the European cultural tradition – in Paris, for example.[66] Only a few generations before Froger, in the nineteenth century,

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[64] Froger 1978, 170: "Le plus petit intervalle perceptible aux oreilles médiévales".

[65] *Ibid.*, 172: "[…] [U]ne pareille oscillation de quart de ton serait parfaitement impossible á chanter."

[66] For instance, "Nuits" for mixed choir by Ianis Xenakis. Mentioned in reviews of a

Eurocentric thinking and xenophobia represented two sides of the same coin, which sometimes led to emotional argumentations against microtonality in chant. In a posthumous publication from 1890, Theodore Nisard accused F. Raillard of triggering "the immediate and definitive collapse of the European liturgical chant" with his suggestion to accept microtones in the restoration of chant; they were "*monstruosités*" comparable with the "*miaulements* called Arabic music".[67]

I.3.3. Palaeography

Some scholars point to possible Greek palaeographical origins of the five special signs in Dij, referencing Alypius' table.[68] Other researchers, listed in Ferreira's dissertation,[69] mention the Greek-inspired Dasia notation and lexical signs as the possible origins. In 1984, Michel Huglo linked the special signs to the notation tables in Boethius' *De institutione musica*,[70] which seems to be the common view among musicologist nowadays.

Froger opens his palaeographical attack on microtonal neumes by rejecting *l'abbé* F. Raillard's comparative analysis of microtonal notations. In 1854, Raillard had presented this analysis with the Dij special signs on the one hand and the adapted neumes and *litterae significativae* as seen in seven other manuscripts on the other hand.[71] His thirty examples provided evidence that there are different ways of notating one and the same phenomenon: microtones.[72]

1968 performance in Paris by Granlet and by Rostand (both in 1968).

[67] "Si c'est là ce que M. Raillard propose à l'admiration des archéologues et à la pratique des chantres pour rendre aux mélodies grégoriennes LEUR BEAUTÉ NATIVE; nous croyons, nous, que l'adoption de pareilles monstruosités, dignes des miaulements de ce qu'on appelle la musique arabe, amènerait la chute immédiate et définitive de notre chant liturgique européen...! » Nisard 1890, 174.

[68] Amongst others Gmelch 1911, 12.

[69] Ferreira 1997, 255, n 55.

[70] Huglo and Merkley 1984, 418.

[71] Raillard 1859. Raillard's thirty-two references are listed on p. 345 in the same issue of the Revue Archéologique.

[51] *Ibid.*, 488.

In his review of the microtonal interpretations by Raillard, Froger refers only to the adapted *clivis* (see *fig.* I.4) and *torculus* in Clu without mentioning the other parallels that the St. Gall *litterae significativae* analysed in Raillard's article.[73]

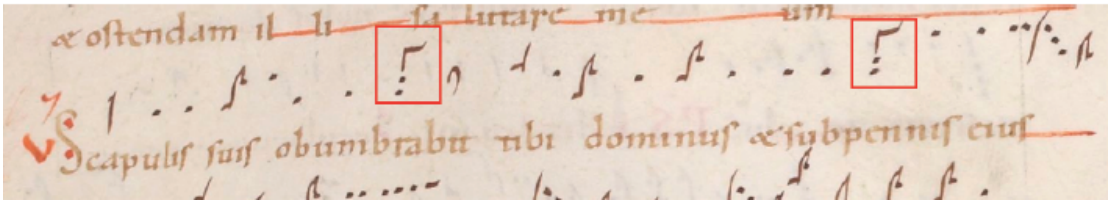

Fig. I.4. Example of a special sign in Clu, 28r: adapted *clivis* (twice).

Froger refuses to take the pitch interpretations into consideration and instead refers to the authoritative palaeographical interpretations by Eugène Cardine,[74] who understands this execution of the *clivis* as a *virga strata*, the 'flag' (*fig*. I.5) expressing a longer duration. Froger refers to the same author to support his rejection of the microtonal interpretations of adapted neumes by Amédé Gastoué (*salicus oriscus*, *trigon*, and *tristroph*a) and Willi Apel (*scandicus*, *oriscus*, and *virga strata*).[75] Froger suggests that Dom Cardine never found any indication for intervals smaller than a semitone.[76]

Froger also comments on the conclusions and examples presented in the first integral analysis of the Dij special signs in Joseph Gmelch's doctoral dissertation.[77] Gmelch lists 1228 occurrences of special signs according to genre, mode and incipit, showing which of the five special signs were applied by the scribes. He interprets the special signs as representing microtones. Comparing the frequency of microtones in liturgy, older chants appear to have more microtones than younger ones. The same applies for solo chants compared to responsorial chants. Gmelch agrees with Raillard's conclusions that the special *clivis* and *torculus* in Clu as well as the five special signs in Dij all represent microtones. He adds that the microtonal signification of the adapted

[73] Sankt Gallen, Stiftsbibliothek, Cod. Sang 359.

[74] Eugène Cardine 1970.

[75] Froger 1978, 151ff.

[76] *Ibid.*: "De façon générale, Dom Cardine n'a jamais trouvé dans les signes de la notation neumatique aucun indique qui tendrait á suggérer l'emploi d'un intervalle plus petit que de demi-ton dans le chant Grégorien."

[77] Gmelch 1911.

neumes in Clu mentioned above is identical with the so-called *franculus* (*fig.* I.5). This neume frequently appears in Ult1 and Ult2 (see Chapter II).

Fig. I.5. *Clivis*, micro-*clivis*, *franculus* (Ult1).

Froger rejects Gmelch's two main arguments for a microtonal explanation of the special signs. First, for *clives* above special signs, Gmelch points to the shorter lengths of the downward *clivis* lines descending from *fa*. For Gmelch, this explains the special sign as a pitch between *fa* and *mi*. Froger thinks that the minimal vertical differences are insufficient to interpret the pitch as microtonal in a notation without lines, which seems to make sense. In a rhetorical question, he dismisses Gmelch's observation as irrelevant: why would a scribe be interested in such detail on the millimetre?[78]

Gmelch's second argument refers to the position of special signs in between letters linked especially to *virga* and *punctum*, as the *virga* represents a higher pitch than a *punctum.* A special sign in between subsequent letters from the alphabet indicates its intermediate pitch, according to Gmelch. Froger disagrees and calls the examples 'special cases'. Ferreira's strongest argument against Froger's rejection of Gmelch's interpretation is that – in spite of the flexible use of the *virga* in Dij – the neume never appears in unison with or lower than a following isolated *punctum*.[79] According to Ferreira's analysis, Gmelch's palaeographical interpretation is correct. Subsequently, Froger addresses the case of the letter-special sign constellations over the word *adiutor* in the gradual *Tibi domine* (*fig.* I.6) including Hansen's transcription, the open notes reflecting the special signs (*fig.* I.7). Already in 1854, Alexandre Vincent pointed to the combination of the

[78] [P]ar quel scrupule en précision se mettrait-il d'un coup a tracer des graphies au millimetre près?" Froger 1978, 156.

[79] Ferreira 1997, 172.

letter-special sign row and the neumes above it in order to explain the meaning of the special signs.[80]

Vincent and scholars after him have considered this text to be crucial for the interpretation of the special signs as representing a pitch lower than *fa* but higher than *mi*. In Dij, a special sign followed by *fa* in neumes is always expressed by a pes; thus, the special sign indicates a pitch lower than *fa*. A *fa*, followed by a special sign, is represented by a *clivis*: the *clivis* reflects the reverse: *fa* is a higher pitch than that of the special sign. Over *adiutor* we see four *pedes*, which represent a repetition of four ascendant pairs of pitches; only the last one is diatonic: f – g. In the letter row, the three preceding pitch pairs are written as: e – special sign,[81] e – special sign, special sign – f. The first two letter-neume combinations indicate that the special sign represents a pitch higher than *mi*; the third one tells us that the special sign represents a pitch lower than *fa* and furthermore, in combination with the preceding two combinations, that it is higher than *mi*.

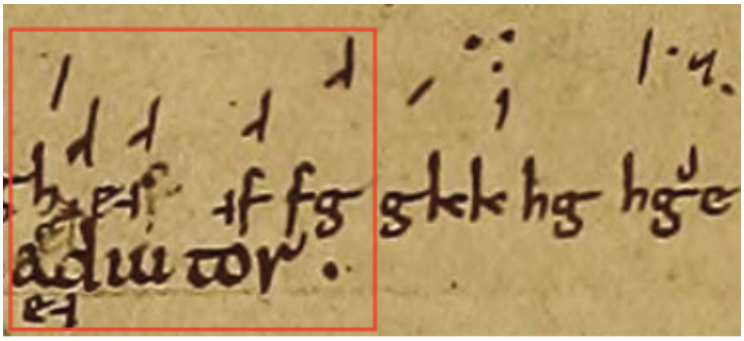

Fig. I.6. Dij, PM 8, 160. *Tibi domine: adiutor*.

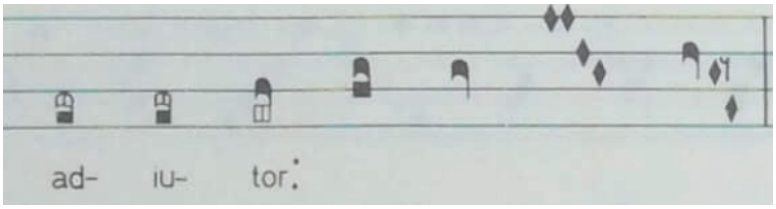

Fig. I.7. Hansen 1974, 247. *Tibi domine:adiutor.*

[80] Vincent 1854, 364.

[81] In the other six manuscripts consulted in the present study, the combination of 'special sign – fa' does not occur.

Hansen transcribed the phrase in *Tibi domine* according to the above explanation. Froger, astoundingly, with some glosses about the its uniqueness, confirms the transcription, but immediately refers to the evident corrections in the original. Froger refers to a comment by Hansen that the corrections belonged to the third layer;[82] for Froger, there is enough reason to dismiss the phrase as faulty, since it lacks historical authority and would be read as *mi – fa, mi – fa,* special sign – *fa*. Ferreira disagrees: a corrector has no intention of corrupting anything; he rather improves what he thinks to be wrong. In addition, Ferreira points to Hansen's critical apparatus,[83] in which he states that the correction most probably belonged to the first layer. Based upon the outcome of the comparative analysis of the two notation rows over *adiutor*, one is inclined to conclude that the two intervals in the string 'mi – special sign – fa' indeed represent intervals smaller than a semitone.

In their theses, De Loos and Ferreira introduced younger manuscripts with microtonal neumes on a staff to the discourse about the special signs in Dij. All previous analyses had to interpret the five special signs in a context of heighted neumes without lines; the comparative sources that Raillard added to the discussion belong to the same category. According to their notation, the newly introduced sources enable us to *see* what earlier analyses referring to special signs had to imagine: intervals smaller than a semitone on positions where the enharmonic genus allows for them. In semiotic terminology, the Guidonian staff transforms adapted neumes expressing microtonal intervals (in these manuscripts *clives* and *torculi*) from symbols into icons. The semiotic difference (cf. Chapter III) between the two sign categories can be described as follows. The information previously provided by symbols (arbitrary signs – in Dij in two rows: letters and special signs in one row and heighted neumes without lines in a second row) is now provided by icons in one row (symbols with a partial visual resemblance to what they represent), contextualised by a coded environment (the cleffed staff). This is an example of how one cluster of symbolic conventions (the special signs of the staff) for other symbols (adapted neumes) lead to a transition from symbol to icon. In essence, this system still applies today.

Unfortunately, when De Loos and Ferreira presented their theses, digital imaging was expensive and complicated. Today, images can illustrate what they had to explain with words. *Fig.* I.8. provides an example illustrating the transition of adapted neumes from

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[82] Hansen 1974, 40*.

[83] *Ibid.*, 582.

symbol to icon. Within the blue rectangular, we can successively distinguish a microtonal *clivis*, a semitone *clivis* and a whole tone *clivis*.

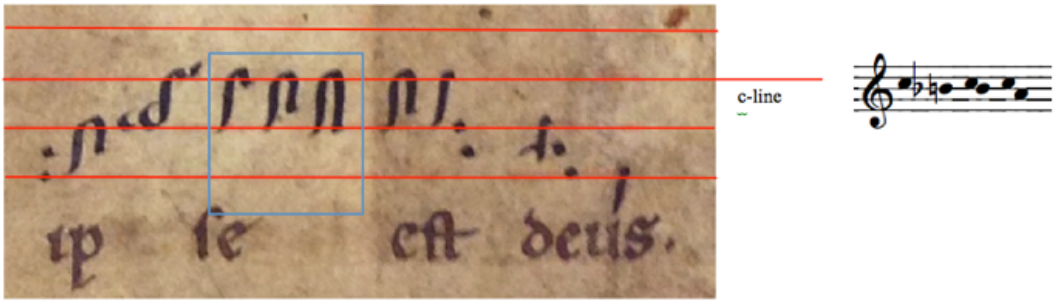

Fig. I.8. SBB mgq 1005. Fly-leaf.[84]

Fig. I.8 demonstrates in a nutshell the importance of notation as indicated by De Loos and Ferreira. The example is taken from a fly-leaf in a book held at the Staatsbibliothek zu Berlin.[85] Its notation matches the characteristics of the Utrecht-Stavelot-Trier neumes on a staff ('notation group 3') as described by De Loos, of which four additional examples from Utrecht manuscripts follow below (*fig*. I.9a-d).

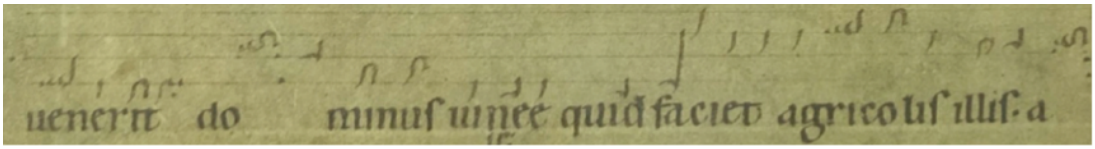

Fig. I.9a. UU-Hss, 4.3A(1)v Fragment from an Antiphonary
formerly owned by the Utrecht Benedictine Abbey, written between 1100 and 1125.[86]

[84] See "Remarks about transcriptions" at the beginning of this thesis.

[85] SBB mgq 1005 was written around 1150, most probably written in the southern Low Countries (origin and dating as suggested by Johan Oosterman and Erik Kwakkel respectively in personal correspondence).

[86] Lousberg 2013.

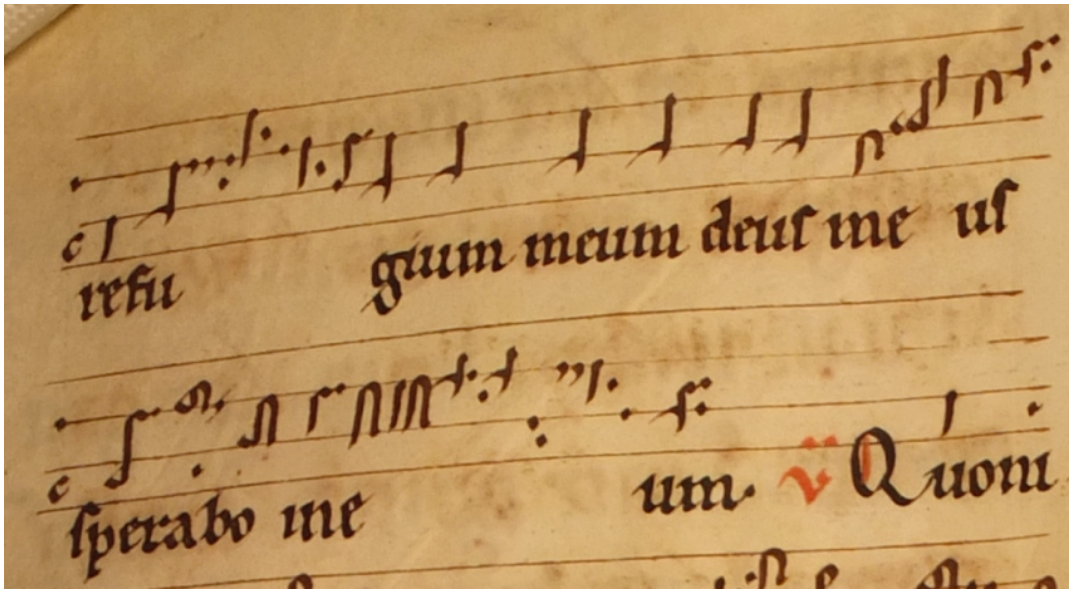

Fig. I.9b. Ult1,45v Missal ABM h 62,
presumably written for the Utrecht Cathedral around 1200.

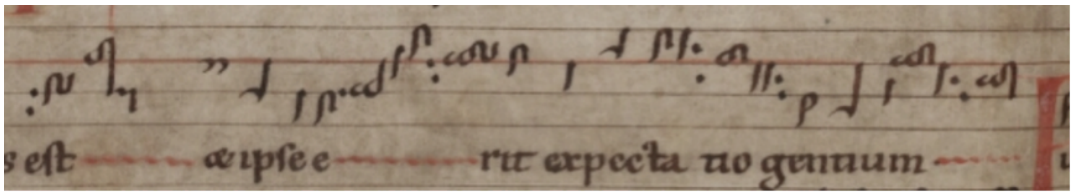

Fig. I.9c. Ult2, 14v Antiphonary U 406,
written for or in the Chapter of St. Mary in Utrecht between 1125 and 1150.[87]

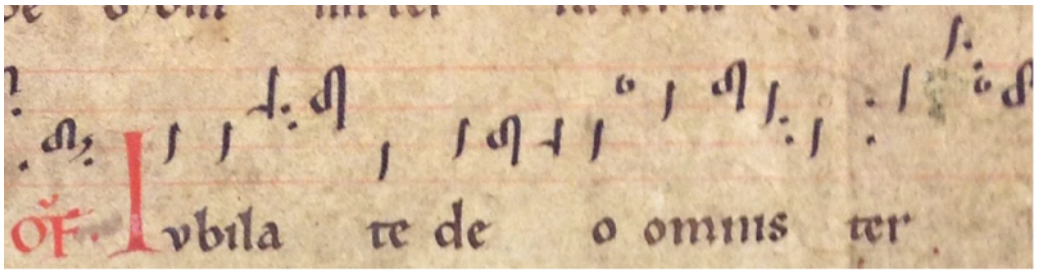

Fig. I.9d. SBB mgq 1005r Fly-leaf.

[87] De Loos, 1996, 251-259. Downey *et al.* 1997.

Froger's palaeographical rejection seems to reflect a selective approach of analyses fitting his story line. In addition, it is exclusively based upon the palaeographical authority of Eugène Cardine, whose interpretations of Gregorian chant echo the – diatonic – stance of Solesmes and the Vatican.[88] By his wording, Froger suggests that Cardine searched for microtones but did not find any indications of them. However, it seems more probable that Dom Cardine did not seriously consider the possibility of a microtonal performance tradition.

Cardine's status was uncontested in 1978, but this situation has changed. In a blog post on the website "Musicologie Médiévale", Jean-François Goudesenne invites his readers to take notice of an extract from his book *Gregorius fabricator cantus* (work in progress), in which he points to the limited number of sources that Cardine consulted. As a starting point for analysing alternative interpretations, Cardine's approach certainly is valuable according to Goudesenne, but deducting general rules for the rhythmic and melodic interpretation for the complete European medieval notational tradition from such a limited, non-representative sample is illusionary.[89]

In a window of opportunity that lasted about 100 – 125 years, between the *in campo aperto* notations and the later quadratic notations, the neumes on a staff enable us to re-assess the microtonal aspects of the earlier notations. Irrespective of the strict diatonic

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[88] Ellis 2013. Katharine Ellis provides in-depth descriptions of Solesmes' strategies and tactics during decennia to filch the editing and printing monopoly of Roman Catholic chant from Pustet in Regensburg. In 1904, the Vatican cancelled Pustet's monopoly (Regensburg) in favour of Solesmes. It may be a coincidence, but before obtaining this monopoly, different views on microtonality were present within the Solesmes congregation. These voices were not heard anymore after Pope Pius X had issued a *motu proprio* in November 1903*, Tra le sollecitudini.* In Chapter II, in the last section of paragraph 3, it is stated that "Special efforts are also to be made to restore the use of Gregorian Chant by the people, so that the faithful may again take a more active part in celebrations of the liturgy, as was the case in ancient times." Microtones did not fit into that concept. By the time Froger wrote his article (the Vatican Constitution Sacrosanctum Concilium), the Constitution of the Sacred Liturgy, issued by Pope Paul VI on December 4, 1963, had already cancelled the exclusive position of Gregorian chant in catholic liturgy (paragraph 116).

[89] Goudesenne 2016. His critical stance resulted in posts which classified his draft as what may be typified as sacrilegious. For his analysis, Cardine refers to ten sources: four manuscripts from France, three from Switzerland, two from Germany, and one from Italy.

context of the Guidonian tool, scribes, as representatives of local traditions, applied it to reflect their chant as it had previously been performed. However, the context for their notation had changed drastically. A staff of four lines with clefs that fixated positions of diatonic pitches replaced the void surrounding the neumes with *in campo aperto* notation. In this new notational context, scribes adapted neumes to represent 'their' microtones within the diatonic frame.

Having discussed the theoretical considerations and palaeographical analyses central in Froger's rejection of a microtonal interpretation of the special signs above, contributions to the discourse introduced *after* the publication of his article will be studied in the following section. These contributions point to additional, partly more practice-related information about the employment of microtones in chant: microtonal intervals in monochord manuals and sources reflecting their contemporaneous reception respectively.

I.4. The Monochord

In his monograph about the monochord, Christian Meyer brings its pedagogical application to the foreground.[90] He argues that medieval iconography as well as treatises and chronicles on the subject all seem to indicate that the monochord was almost exclusively used for teaching music in monastic and cathedral schools; monochord manuals mainly reflect practical knowledge, rather than exclusively academic theory.[91] Ferreira refers to the monochord[92] by quoting Meyer's publication. About 150 manuals with detailed measurements survive from the ninth to the fifteenth centuries.[93] Thirteen texts, copied in forty sources, offer instructions about how to find the proportions for the diesis (as seen above, among others, in Guido's *Micrologus*) and for C∂+ and F∂+; the latter are typified as pitches belonging to the chromatic genus (without further theoretical foundations).

Meyer lists the texts containing instructions on how to find the enharmonic intervals, of which all but two are in line with the measurements for the enharmonic and chromatic genera as mentioned in Boethius' *De Institutione musica*, book IV, chapters 6-

[90] Meyer 1996.
[91] *Ibid.*, xxi, xxvi.
[92] Ferreira 1997, 183.
[93] The numbers and lists in this paragraph have been compiled from Meyer 1996.

12.[94] He rejects Froger's attempts to interpret the special signs modally or rhythmically. According to Meyer, the combination of the monochord's practical employment, including microtones with the enharmonic positions of the special signs as in Dij and other manuscripts, serves as the final argument for Froger's rejection.[95]

By reorganising Meyer's details about these manuals, it is possible to provide some additional information about the employment of non-diatonic intervals.[96] He consulted 147 manuscripts, of which 89 were written prior to the fourteenth century and 58 during or after that century. The choice for the fourteenth century lies in the fact that liturgical manuscripts with microtones were written until about the middle of the thirteenth century. The thirteen texts that contain measurements for the enharmonic genus can be found in 40 manuscripts, of which 33 were written before the fourteenth century.

[94] Meyer 1996, xxv.

[95] Meyer 1996, xxxvi, fn 11: "Cette coïncidence, déja signalée par Gastoué, p. 164, devrait mettre un terme définitif aux hypothèses modales ou rythmiques formulées en 1978 par J. Froger,
p. 178."

[96] A detailed list of the following details of the manuscripts can be found in APPENDIX I.

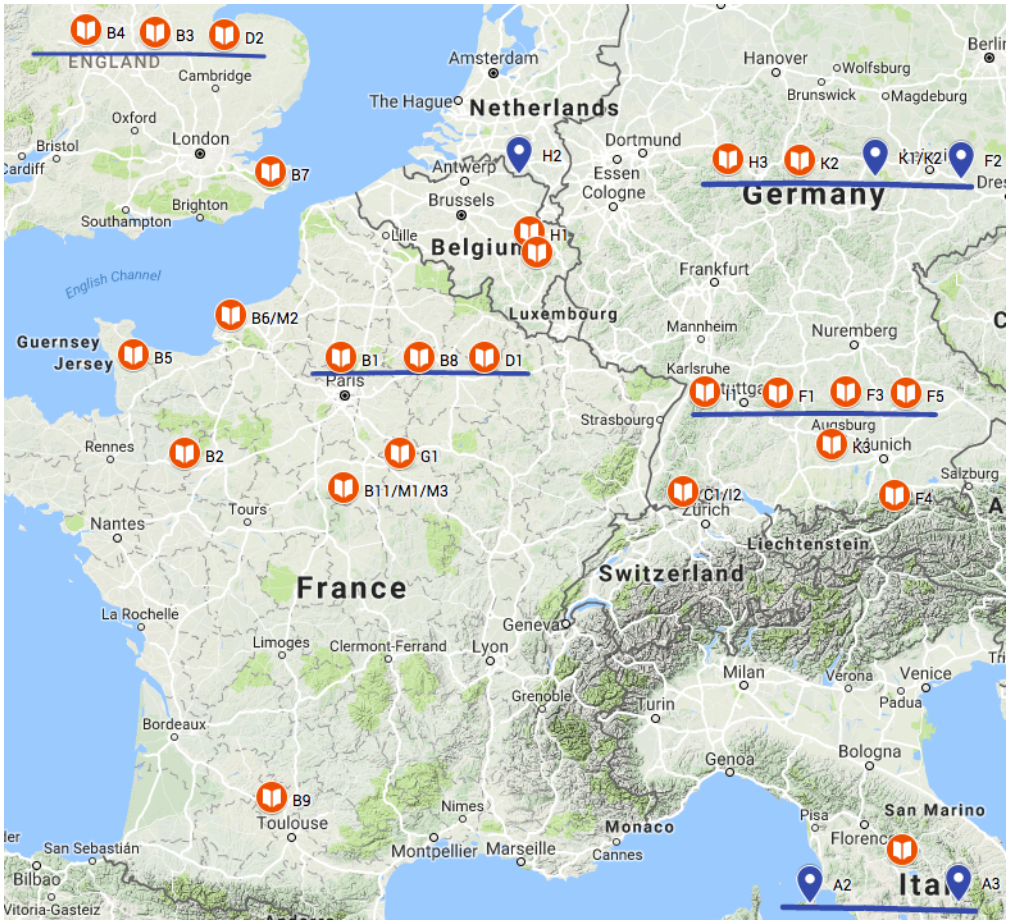

Fig. I.10. Map showing locations with sources in which microtones are calculated.

The map in *Fig.* I.10 illustrates the origins of sources in which microtones are calculated. The orange markers represent sources written pre-s. xiv; the blue markers indicate sources written during or later than s. xiv. The underlined markers refer to general indications about the manuscripts' origins: England, northern France, Germany, southern Germany and Bavaria, and Italy. Guido's *Prologus* (in Arrezo) is the only marker of just three manuscripts located in Italy that contain measurements for the enharmonic genus. The concentration of manuscripts with enharmonic measurements in a line stretching from Normandy to Bavaria is striking. The Liège region, labelled 'the paradise of priests' in the eleventh century,[97] is relatively well represented by three manuscripts. Most manuscripts containing enharmonic measurements for the monochord are convolutes. They combine monochord manuals with music treatises, often including instructions about tuning organ

[97] Saucier 2014.

pipes and bells (28), theology and liturgy (4), arithmetic and astronomy (3), and rhetoric (1).

The twelfth-century convolute Wien, ÖNB Cpv 51 Univ. 38 (see APPENDIX I, manuscript I.1) provides a fine example of the material analysed by Meyer. Next to instructions on how to find diatonic, enharmonic and chromatic pitches on the monochord, the manuscript contains treatises on music by Boethius, Guido, Bern of Reichenau, John Cotton, William of Hirsau, Hermannus Contractus, and Henry of Augsburg. It also includes rhetorical works by Cicero and *Ad Herennium.*[98] In addition to music theory and basic rhetorical instruction, it comprises monochord instructions providing all of the enharmonic and chromatic pitch material, in fact, the same non-diatonic pitches employed in Ult2, analysed in Chapter II.[99] These kinds of convolutes may be considered as handbooks for the musical presentation of biblical text, as the analysis presented in Chapter II will demonstrate.

The texts analysed by Meyer seem to indicate that the use of monochord manuals was primarily pedagogical rather than for the purpose of *musica speculativa*. If this is so, the manuscripts containing manuals for the measurement of non-diatonic intervals point to communities where these intervals were in common practice, certainly if they appear at the same locations in combination with microtonal neumes in notated liturgical manuscripts. A direct link between Greek theory and microtonal intervals might be debatable. It seems as though the perceptual and authoritative qualities of the monochord rather than theoretical considerations linked microtones as a performative element to these positions.

I.5. Contemporaneous Reception

In comparison to theoretical treatises, by far fewer medieval authors are known to have mentioned the diesis in relation to the *performance* of chant, but we have to take into consideration that apart from Ike de Loos, musicologists largely neglected this aspect. In other words, more testimonies may exist. Some rather ad random Internet searches resulted in a few remarkable finds that will be presented below.

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[98] Meyer 1996, cxv.

[99] *Ibid.*, 257. The monochord instruction in Wien ÖNB Cpv 51 Univ. 38 contains all non-diatonic pitches employed in Ult2: four chromatic pitches: C∂+, F∂+, c∂+, f∂+, and five enharmonic pitches: C∂-, F∂-, b_b-, c∂-, and f∂-.

De Loos refers to two chronicles from the Low Countries that might be relevant in this respect. The first is a chronicle from the Benedictine Abbey of Saint Trond (in Flemish Sint-Truiden, now Belgium), written during the first quarter of the twelfth century.[100] A monk named Rudolph, educated in Liège, comes to teach chant and Guidonian notation in the nearby city of Saint-Trond. The chronicler mentions that the monastery's chant always has been different from the surrounding congregations and that Rudolf did not succeed in notating their chants on a staff. The second reference is found in a letter by a Frisian abbot named Emo written while in Prémontré at the beginning of the thirteenth century to his monastery in Wittewiersum.[101] Concerning the chant performed by the monks in Prémontré, he remarked: *Semitonium quoque voce valde circumflexa cantant* [They sing the semitone with a large inflexion].

Ferreira mentions a tenth-century anonymous gloss in Boethius's *De Musica Institutione* referring to "the sweetest enharmonic genus".[102] Pseudo-Remigius of Auxerre, writing in Northern-France around the third quarter of the ninth century, put the enharmonic genus in a practical geographical context, attributing the enharmonic tradition to the Romans.[103] Ferreira also points to Bern von Reichenau's remark about the "sweetness" of the enharmonic genus; he does not exclude it from chant, contrary to the chromatic genus.[104] The only direct testimonial quote comes from the treatise *Tractatus de musica* (1280) by the Scottish Dominican, Hieronymus de Moravia. According to Ferreira, he

> states plainly that the French, contrary to other nations, are fond of mixing non-diatonic intervals with ecclesiastical music, particularly through the association of the enharmonic diesis with the diatonic genus.[105]

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[100] De Loos 1996, 195. She refers to: Rodolphe de Saint-Tronde 1986 as quoted in Mostert 1995, 111–112.

[101] Jansen and Janse 1991, pp. 38–39.

[102] Ferreira 1997, 231, note 133, quoting Bernhard 1988, 30.

[103] Remigius of Auxerre, c. 841-908. "Enarmonicum vero molle et fluxum quasi morosum quo
romani uti solent" in: Smits van Waesberghe 1952, 93.

[104] Ferreira 1997, 231, note 134, quoting Jos Smits van Waesberghe's edition of Bern von Reichenau 1978, 42–43.

[105] *Ibid.*, 185.

By quoting Hieronymus de Moravia, Ferreira establishes the link between dieses and the performance of chant as late as the last quarter of the thirteenth century. In addition, according to the personal testimony of a very musically skilled medieval cleric, microtonal inflections were acoustically and theoretically distinctive pitches, contrary to what Froger and Bescond assume. Hieronymous even refers to the employment of the chromatic genus in the performance of chant by French monks:

> Gaudent insuper, cum modum organicum notis ecclesiasticis admiscent, quod etiam non abjicit primus modus, necnon et de admixtione modorum duorum generum relictorum. Nam diesim enharmonicam et trihemitonium chromaticum generi diatonico associant. Semitonium loco toni et e converso commutant, in quo quidem a cunctis nationibus in cantu discordant.
>
> [In addition, it pleases them to mix the organum singing with the [monophonic, LL] ecclesiastical chant, and while this mingling is admissible, they in addition combine the other two remaining genera: they connect the enharmonic diesis and the chromatic one-and-a-half-tone interval with the diatonic genus. They switch semitones with whole tones, by which their chant is different from all other nations.][106]

Apart from De Moravia's quotes, De Loos's and Ferreira's references are only indirectly related to microtones. De Loos's references might make sense in diatonic contexts as well. The chronicle of Saint-Trond could refer to rhythmic elements instead of to non-diatonic pitches and Emo's letter may well point to the "East-Frankish" tendency to skip *mi* for *fa*. However, it cannot be excluded that both texts might indicate that around Saint-Trond, or even at small geographical distances,[107] different non-diatonic practices were in existence.

It is interesting to note that De Moravia's observations contain some meta-information about the reception, notation, and performance practice of his time. First, De Moravia had practical and theoretical knowledge of the three Greek genera, as is evident from the precise wording of his auditory experience. Second, when hearing this 'French' chant, the predominant notation in France during more or less one hundred years had been

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[106] Hieronymus De Moravia and Simon Cserba, Hieronymous de Moravia Tractatus de musica (Pustet, 1935), Vol. 2, 187.

[107] According to the chronicle, Rodulphus received his musical education in Liège. By medieval roads, the distance between Liège and Saint Trond was about 40 kilometres. The total picture, however, remains puzzling: I have seen manuscripts from Liège with neumes representing microtonal intervals, which, assumingly, Rodulphus could have known. He, if anyone, would have been the person to notate microtonal inflections. Yet apparently, he did not succeed in notating the peculiarities of the Saint Trond repertory.

shifting from neumes without lines to quadratic notation on lines. That means that the non-diatonic subtleties he heard were most probably no longer reflected in the predominant quadratic notation. Apparently, the *performance* still allowed for non-diatonic elements, whereas the contemporaneous *notation* reflected only diatonic intervals. On the one hand, one could object to this with the argumentation that the religious communities still learned the liturgical chants based upon manuscripts containing the older notation. On the other hand, if De Moravia's remarks refer to the Notre Dame and the Benedictine Abbey of Saint-Denis in Paris,[108] then this does not hold up because we are not aware of earlier notational traditions that reflected non-diatonic intervals for those communities.

The testimonies about the performance of microtonal intervals as presented by De Loos and Ferreira belong to a research category barely present in other analyses about this subject. They might provide new insights about the employment of microtones in chant in comparison to what is provided the late classical and medieval treatises. When writing this thesis, without systematically searching for it, I encountered several texts that shed additional light on cultural contexts of microtonal performance traditions in north-western Europe. Sources confirm the performance of microtonal intervals in times where – at least in regions nowadays situated in The Netherlands, Belgium, and France – the quadratic notation has not reflected them for already quite some time.

Around 1400, Arnulf, (presumably) a monk from the Benedictine Abbey of St. Ghislain (some 50 km south of Brussels, now Belgium), rated four classes of singers in a *Tractatulus*. The lowest class consists of singers who have no idea whatsoever about the *ars musice*.[109] The fourth and highest class of singers, according to Arnulf, comprises the singers gifted with natural instinct and a sweet voice. Within this highest class, female singers are even more distinguished:

> E quibus pars altera, favorosi videlicet sexus feminei, que quanto rarior tanto preciosior, dum in dulcinomi gutturis epigloto tonos librate dividit in semitonia, et semitonia in athomos indivisibiles garritat, ineffabili lascivit melodiomate quod magis putares angelicum quam humanum.[110]
>
> [Among these there is a second group – that is to say of the favoured female sex – which is so much the more precious the more it is rare; when it freely divides tones into semitones

[108] Gerlach 2006, 130.

[109] Page 1992. Prima plebescit in illis, ut convenit, qui artem musice prorsus ignari […].

[110] *Ibid.* 16.

with a sweet-sounding throat, and divides semitones into indivisible microtones, it enjoys itself with an indescribable melody that you would rather deem angelic than human.][111]

A rating of microtones from a socio-cultural point of view appears in an anonymous chronicle from the early fourteenth century in Southern-Germany.[112] The author repeats the content of Henry of Augsburg's statement that chant employs the diatonic genus, that the chromatic genus is too effeminate for it, and that the enharmonic genus is too difficult.[113] Besides the fact that it was too complex to learn, he / she adds a socio-cultural element: "Due to its difficulty and the laziness of people, the enharmonic genus *even disappeared from the court* (italics LL), whereas the diatonic genus continued to be used." This reverberates a French (?) text that refers to the singing of the enharmonic genus only at courts and in cathedrals.[114] Like Arnulf's chronicle, these remarks seem to reflect the perception of a high artistic standard in a presumably elitist environment.

Finally, a baffling reference to the essence of the analysis's results that will be presented in the next chapter. Around 1275, in the prologue to a comment on the Song of Songs, known as *Cantuariensis*, a member of the Franciscan order links the diatonic genus to allegorical exegesis, the enharmonic genus to anagogical exegesis, and the chromatic genus to tropological exegesis (see APPENDIX II).[115] These exegesis categories provide the

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[111] *Ibid.*, 20.

[112] Anonymous [Tractatulus de musica] Munich, Bayerische Staatsbibliothek, Clm 28186, ff. 258r-259v., here f. 258v, in: Thesaurus Musicarum Latinarum, School of Music Indiana University Bloomington. Accessed August 21, 2016. [-f.258v] […] Enarmonium uero propter eius difficultatem et hominum desidiam iam dudum ab aula recessit, uixque dyatonicum in usu remansit.

[113] Henricus 1977, 36.

[114] Encountered in a very early stage of research. The source appears to be irretrievable now, unfortunately.

[115] Innsbruck Universitätsbibliothek MS 144, f 1-127. I discovered the text and its transcription in Schepers 1999, 64, fn 12. Chapter II of Scheper's dissertation including this footnote is available online (www.rug.nl/research/portal/files/9856958/B1d1h2.pdf); an English text of his analysis (without this particular footnote) can be found in Kees Schepers, 'The Genesis of Glossa Tripartita super Cantica', Revue d'histoire des textes 29, no. 1999 (2000): 85–139, www.persee.fr/doc/rht_0373-6075_2000_num_29_1999_1477, accessed 1 August, 2016. The Franciscan provenance is based upon a reference to Franciscus as "pater noster". When unravelling the text's provenance, Schepers found a reference to a Thomas Cantuariensis, but dismisses the idea that this is indeed the name of the author (Schepers 1999, 62.).

basis for hermeneutics, the authorised interpretation of the meanings of Biblical texts. The Augustinian approach to hermeneutics in essence reflects the views of the early Christian theologian Origen (*c*185-254), a church father of the Alexandrine school. According to his interpretation, Bible texts should have two interpretations: a literal and a spiritual one. Later, Augustine attributed three senses to the spiritual interpretation.[116] Firstly, the allegorical or typological sense, which considers historical information from a spiritual point of view. Secondly, the moral or tropological sense, which reflects on practical issues for believers. Thirdly, the anagogical sense, which places the interpretation in an eschatological and eternal context. Through long training and perseverance, the believer may widen his understanding of the Scripture from the literal interpretation towards the three senses of the spiritual interpretation. One Biblical expression may reflect a combination of several hermeneutical approaches.

The prologue could be understood as a stylistic example of intertextuality: the author thematically connects musical themes (referring to the sounds of a ten-string psaltery) to the text of the Song of Songs in a scholastic triadic approach, of which the references to the three kinds of exegesis are an example. This triadic comparison is preceded by a text that reflects similar views on the employment of the three genera in chant as mentioned in the sources quoted above and in Ferreira's and De Loos's theses. The diatonic genus is referred to as the Holy Church's choice and the chromatic genus is allocated to secular music but not condemned. The enharmonic genus is acceptable but not preferred, "because of its difficulty or perhaps due to its extreme sweetness, so that simple-minded people would rather listen to the music than to the words." As evident in other sources, themes of difficulty and an elitist culture set the scene.

Some sources (*Cantuariensis*, Hieronymous de Moravia, Arnulf of Ghislain, and several anonymous works) refer directly to the employment of enharmonic intervals (distinguishing them from the 'standard' diatonic intervals) in chant and how difficult it was to perform those chants (which may refer to the complete complex of requirements or to the pitches only). Other texts, like the chronicle from Saint-Truiden and the letter from Abbot Emo leave room for interpretations not related to microtones.

Interestingly, two sources specifically refer to courts and / or cathedrals as venues for the performance of microtones; whereas the author of *Cantuariensis* highlights another perspective by assuming that simple-minded people could be distracted from the text by

[116] Klein *et al.* 1993, 38.

"the extreme sweetness" of microtonal inflections.[117] If the letter written by Abbot Emo indeed implies microtones, this socio-cultural aspect could explain why the small rural monastic community in the isolated north of the Low Countries did not sing "with large inflexions". De Loos assumes that the microtonal practice survived longer in the French Prémontré than in the Frisian Wittewierum. If Emo refers to microtones, the explanation might rather be in the difference between the prestigious abbey of Prémontré on the one hand and the rural monastery Wittewierum on the other.

Medieval treatises and chronicles both show different opinions about the admissibility of employing the enharmonic genus in chant, but all authors known to De Loos and Ferreira seem to reject the chromatic genus; the *Cantuariensis* text puts the diatonic genus in a favoured position but explicitly leaves room for both non-diatonic genera. In Chapter II, the analysis of cases in which the letter 's' is applied in Ult2 seems to confirm that the *Cantuariensis* text is not a fantasy, but in addition to an enharmonic tradition, it also reflects traces of a performance practice that allowed for non-diatonic semitones. Monochord manuals, used until the fifteenth century, seem to reflect the employment of these non-diatonic pitches in chant, as the microtonal inflections do in the chronicle by Arnulf of Saint-Ghislain. His writing reflects a positive perception of enharmonic chant: not out-of-use and too difficult, but rather angelic with a five-star rating for artistic performance.

I.6. Definitions of Medieval Microtonality

Where Froger dismisses performance as an aspect to be considered, Ferreira gives it a central place in his contextualisation of microtones:

> [… the] relatively extensive, self-sufficient use in traditional performance practice of intervals distinctly smaller than a semitone, conceptualized as separate entities through notational and theoretical means.[118]

In the subsequent paragraph, Ferreira emphasises the narrow character of his definition: it excludes performance without notational and theoretical means. Ferreira explains that self-sufficiency should be seen as the opposite of 'in conjunction with diatonic intervals', a

[117] It also echoes Aristides Quintilianus's opinion, mentioned above.

[118] Ferreira 1997, 163.

methodological consideration that he deems to be useful for further analysis, even if the distinction between diatonic and non-diatonic turns out to be an inadequate concept for Romano-Frankish chant.[119] In 2012, Ferreira dismissed explicit theoretical links between medieval microtones and the Greek enharmonic genus.[120] The links were rather practical considerations, whereby qualities of the monochord stood central:

> Quidquid alicubi in monocordo cantari potuit de usu aeccleasiae non pertermisit se preterire.[121]
>
> [Whatever one may sing according to the monochord cannot be forbidden to be sung in liturgy].

What seems to remain for microtonal inflections is a "modal colouring" by a "particularly high intonation of *mi.*"[122] Ferreira's approach is in line with De Loos's earlier palaeographical observations in the manuscripts analysed in her thesis.[123] According to De Loos, the microtone is a *chroma*, a colouring of a diatonic pitch and never appears as a separate pitch:

> Omdat het bij deze praktijk niet gaat om het invoegen van een extra toontrap in het toonsysteem, is het strikt genomen niet juist om te spreken van 'microtonaliteit': deze term zou op zijn plaats zijn wanneer er kwarttonen of andere onderverdelingen van de halve toon aangetoond waren. Het betreft […] een kleuring van bestaande tonen, het aanbrengen van een 'chroma', niet met een halve toon zoals we in de moderne harmonische muziek gewend zijn, maar met een klein intonatieverschil. De term 'micro-chromatiek' dekt dit begrip beter.
>
> [Because this tradition does not add an extra, separate, pitch to the tonal system, actually, it is wrong to refer to 'microtonality': this terminology would apply if quartertones or other subdivisions of the semitone had been observed (in the manuscripts analysed, LL). It is a colouring of existing pitches, by the application of a 'chroma', not by a semitone as in modern harmonies, but by a small intonational difference. 'Micro-chromatism' would be a better description.][124]

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[119] Ibid.

[120] Ferreira 2012, 158.

[121] Ferreira (1997, 158, fn 26) quotes Rudolph of Saint Trond.

[122] *Ibid.*, 463.

[123] De Loos 194f.

[124] My translation. De Loos 1996, 93.

De Loos limits her observations to the manuscripts analysed in her thesis ("this tradition"), but other perceptions also existed, as apparent in Dij. In his analysis of Dij, Gmelch lists more than a hundred cases (out of more than 1200) that reflect a tradition in which the microtone occurs as a distinct, separate, sometimes even repeated separate pitch at crucial positions in melodic phrases and in the text.[125] By far, the majority of the special signs match De Loos's observations, however, and so does Gmelch's description of their meaning as "small changes or trimmings of diatonic pitches".[126] De Loos's assessment of microtonality in its performative context follows the analyses by Hansen and Schneyderberg who both, referring to the special signs, underline the intonational character of the pitches.[127]

Ferreira's definition as presented in his thesis on the one hand seems to have a tendency for over-theorisation, which in my opinion blurs more than it conceptualises. On the other hand, one might have expected a reference to enharmonic concepts. In his 1997 definition, he explicitly disconnects microtones from diatonic intervals and from a diatonic setting and finds himself diametrically opposed to De Loos's and Gmelch's earlier interpretations of the phenomenon. They stress the additive character of microtonality in a basically diatonic setting. His approach from 2012 is more compact and better catches the phenomenon, although in the context of non-diatonic pitches, 'pitch colouring' instead of 'modal colouring' would have seemed better; the latter suggests a systematic link to modes, which is not evident.

The other authors cited by Ferreira, who acknowledge the microtonal meaning of the special signs, seem to agree that the phenomenon is more related to performance practice than to musical theory. The introduction of De Loos's term *micro-chromaticism* is compelling, but it would cause quite some confusion by its connotations with the chromatic genus on the one hand and the chromaticism in our times on the other. It looks like De Loos had the same impression since after introducing the terminology, she did not apply it in the remaining text of her thesis. A rephrased definition, resulting from my analysis presented in Chapter II and a subsequent semiotic approach, will be presented in Chapter III, section 7.

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[125] Gmelch 1911, 61-65. Examples and listings.

[126] *Ibid.*, 66: "Hier dürfen unsere Intervalle mehr einer leichten Umschwung oder Verbrämung der diatonischen Tonstufen gleichkommen".

[127] Hansen 1974, 43*. Schneyderberg 1990, 13–17.

The continuing scepticism about the employment of microtones in medieval chants seems misplaced. De Loos's and Ferreira's critical reviews completely undermine Froger's rejection of microtonal meanings, as do the arguments brought forward based on insights gained after 1978. A more convincing presentation of the *visual* (and the semiotic) arguments related to the sources with neumes on a staff could have crucially contributed to an analytical shift in the field, but digital imaging in doctoral theses was beyond the possibilities in the nineties. The introduction of these new sources changed the semiotic setting of the discourse completely, but it is not clear whether De Loos and Ferreira were fully aware of this at the time; at least, they did not stress this aspect.

By including microtonal inflections, Ferreira's conclusions could have had an important impact on the analysis of Romano-Frankish chant. Apparently, most musicologists consider the phenomenon to be a niche, in addition to being contested as an imaginary phenomenon by a famous colleague. After the publications by De Loos and Ferreira, musicologists felt it necessary to at least mention microtonality more often than before, but it was almost invariably accompanied by adjectives such as 'presumed'. Huglo, who had already been sceptical about Froger's rejective conclusions before,[128] agrees with Ferreira's findings: "The musicologist cannot but agree with the evidence shown by Ferreira".[129] In the *Cambridge History of Western Music History*, Jan Herlinger tries to revive the discourse:

> Ferreira […] concludes that the evidence does indeed support the existence, in eleventh and twelfth- century practice, of microtonal singing. While Ferreira describes his conclusions as provisional, he certainly has thrown down the gauntlet for anyone seeking to argue the other side of the question.[130]

Analysing variants in Frankish chant, Andreas Pfisterer comments on Ferreira's conclusions. He agrees with Ferreira's rejection of Froger's stances, but questions the former's assumption that the microtonal inflections were part of a widespread tradition with oriental roots, which was introduced in the Carolingian tradition during the first half of the ninth century. Pfisterer agrees that microtonal inflections could be part of the

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[128] Huglo 1980, 43*: "[…] l'hypothèse "rhytmique semble [...] échappatoire."

[129] Huglo 1999, 41*f.: "[…] [L]e musicologue ne peut que se plier aux évidences démontrées par Ferreira." Like Ferreira, Huglo assumes that microtones must have had Hellenistic roots.

[130] Herlinger 2002, 186.

reconstruction of the earliest liturgical chants but considers Ferreira's thesis too weak to consider these intervals in his own thesis, which will be referred to in chapter IV. Pfisterer's objections refer to the limited number of manuscripts that Ferreira analysed when assuming a widespread transmission tradition.

Another weakness according to Pfisterer is that the microtones occur especially in combination with (predominantly) *fa* and *do*, but are seemingly facultative and, consequently, with considerable differences between the manuscripts in which symbols – assumingly representing microtonal inflections – occur. In the manuscripts that Ferreira consulted, the older E / b recitation had already shifted towards F / c, which Pfisterer sees as a complicating factor, accepting the phenomenon as "credible witness[es]". Pfisterer doubts whether these microtonal inflections – always occurring near the instable semitones – can indeed be considered as a further refinement of the original melodic contours. He completely neglects Ferreira's extensive references to the enharmonic genus and the fixated positions of the microtonal inflections within it. Pfisterer also omits Christian Meyer's findings about the role of the monochord, in which the positions of the microtonal inflections were explained and calculated. Even if the Greek enharmonic theory for performance was but a remote echo, its practical implications are reflected by the monochord. That in later traditions the semitone became unstable was partly a consequence of diachronic brain drain concerning the functions of, and interactions between, the practical remains of the three Greek genera, in whatever way they were understood. The facultative character has functional backgrounds as well, which will be explained in Chapter II.

> Um eine Abhängigkeit von einer gemeinsamen Tradition zu beweisen, müsste man Übereinstimmungen finden, die sich nicht durch die Auswirkung derselben Tendenz auf dieselben Melodien erklären lassen. Dies hat Ferreira gar nicht erst versucht und die Suche dürfte auch vergeblich sein.[131]
>
> [In order to prove a dependency on a common tradition, it would be necessary to find matches that cannot be explained by the effect of the same tendency on the same melodies. Ferreira did not even attempt this and the quest [for such dependency, LL] may be expected to be in vain.]

[131] Pfisterer 2002, 14.

If I understand Pfisterer well, he would consider microtonal inflections to be an essential element in reconstructing the earlier phases of liturgical chant if an underlying explanation for the irregular occurrence of these quartertones – which he considers as almost illusionary – could be found. Given these considerations, Pfisterer prefers to consider microtonal inflections as local intonation peculiarities, rather than as a phenomenal characteristic of "the original Gregorian melodies".

It took some time, but I hope that the present efforts may cause him to consider reviewing his opinion, since analysing a larger selection of manuscripts was beyond the scope of this thesis. Coincidently, like for the analysis carried out for the manuscripts from the Antiphonale Missarum Sextuplex, six manuscripts for Mass were included in my analysis. Their diachronic spread spans about 200 years and the distance by road and river between Cluny and Utrecht was more than 1.100 kilometres. Even during Roman times, when the infrastructures for travelling were generally better than during the Middle Ages, it took at least 33 days to travel this distance by foot in the summer. It seems that these 'local intonation peculiarities' were quite popular in north-western Europe for an extended period of time. However, I am the first to agree that the depth of my analysis cannot be compared with Hesbert's studies and that more research will be needed to reconstruct an "Überlieferungs-zusammenhang", which is perhaps best translated as a 'coherent transmission'. A hypothetical construct will be presented in Chapter IV.

After the publication of Ferreira's doctoral dissertation, no serious discourse developed; no subsequent analysis of Romano-Frankish chant moves beyond a rudimentary microtonal perspective. Scholars continued to base their findings exclusively on diatonic intervals.

I.7. The Functions of the Special Signs

In paragraph J of his article,[132] Froger attempts to reconstruct the meaning of the special signs by exploring the patterns in which they are employed. Froger starts with an analysis of the special signs' relation to the connected neumes. The three main categories he finds are: special signs corresponding with the downward pitch in clives and similar neume constellations at the end of a compound neume (68%), torculi with a corresponding special sign at the penultimate pitch (11%), and special signs in the upward positions of pes and similar neumes (10%).

[132] Froger 1978, 172f.

His next step is to analyse three types of *deuterus* cadences. Square brackets around letters indicate neumes other than the punctum or virga; the underlined bold letters indicate neumes over a special sign (Froger projects the Greek theory onto the representation of the special signs by referring to the subsemitonal pitches e and b).

[g - a - g] g - f - **e** - f [f - **e**]	With special signs for e, this cadence occurs 38 times in *deuterus*.
No special signs;	8 times
On both e's:	11 times
On first e only:	3 times
On last e only	16 times
[b - d - c] c [c - **b**]	Occurs 101 times: 52 times at the end of a verse / chant, the b invariably a letter. In the remaining 49 places where the cadence lies elsewhere, the last b is a special sign 15 times and a letter 34 times.
[f - **e**] [f - g] g -f	Occurs 31 times in Tracts of the second mode. The e has a letter 16 times and a special sign 15 times.

The positions of the special signs in cadences evidently provide no insight into any systematic function of special signs. Froger admits that Amadé Gastoué's interpretation of the special signs as embellishments does not indicate anything about their (melodic) function, as they might occur anywhere without a system.[133] The same applies to Baralli's reference to some formulas as found in the Offertorium *Deus fac mecum*, verse 1, *Deus laudem mea*: special sign – f – special sign – f – special sign, recurring in verse 3, *Pro eo ut* plus some similar formulas. Froger also had to dismiss Baralli's tentative explanation that special signs occur in downward movements as last notes of the tetrachord. As far as the special signs not representing embellishments as suggested by Gastoué, an analysis by Albert-Jacques Bescond resulted in two possible explanations for the remaining cases,[134] a rhythmic and a modal one. Froger quotes Bescond for a modal explanation, assuming that

[133] Gastoué 1907, pp. II, 156-164.

[134] Bescond 1972, 68f.

> in deuterus, the final *mi* is always a letter, as is the *si* a fifth; only when the *si* is part of an embellishment, the scribe applies a special sign. The letter represents the *mi* as if it is the modal pitch, but if an embellishment occurs on *mi*, the special sign represents a *fa*.[135]

Interpreted this way, the special sign would represent the non-modal note in the embellishment as opposed to the modal note, which is represented by a letter. Froger's analysis shows, however, that special signs frequently occur in prominent positions on *mi* and *si*, in cadences and elsewhere.

Bescond sought a rhythmic explanation by referring to situations where the special sign occurs at the end of a downward melodic phrase, followed by a new upward melody, starting at the same pitch, but represented by a letter. In these cases, the special sign would represent a cut or pause as an indicator of rhythm. Froger discovered that in the majority of cases, the special sign occurs at the end of a cadence. Disregarding the other limitative conditions that Bescond mentions, Froger found some 200 cadential cases (in all modes) where the special sign could be interpreted as a pause. Two questions remain: why are there so many occurrences in *deuterus* as compared to other modes and why only in connection with semitonal positions?

Evidently, the results give no clear indications of systematic employments of the special signs. Froger admits that an explanation is evasive since the employment of special signs seems to lack coherence: "The unstable relation between letter and special sign is undeniable. The inconsistency in the employment of special signs is very frustrating for the analysis of their function."[136] Shifting his attention, Froger remarks that the special signs often seem to emphasize important thematic words.[137] An observation by Baralli that the special signs frequently occur in 'solemn intonations' possibly points in the same direction.[138] But again, it seems to be impossible to come up with systematic evidence.

Ferreira and De Loos do not elaborate on Froger's and Baralli's tentative functional explanations. De Loos pointed to ornamental melodic formulas containing microtones. In her thesis, she refers to formulas as in *fig*. I.8 for Ult2. In her introduction to the edition of Ult2, she states without further comment that concerning Ult2 and U 407, "in all fifth mode

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[135] Froger 1978, 178. My translation.

[136] "Le flottement lettre/symbole est un fait indéniable. Cette inconstance dans l'emploi des symboles est très gênante pour l'étude de leur fonction." Froger 1978, 174f.

[137] Froger 1978, 178.

[138] Ibid.

responsory verses microtonal clives occur on the first syllable of the pentasyllabic cadences at the end of the verses."[139] However, do these microtonal contexts / constellations as observed in the Office have a systemic character for Mass? Apparently, neither Froger nor Baralli detected them. Did they miss these and / other microtone triggers? The musicological interpretations thus far indicate three largely untested functionalities for microtones:

Mass:
1. Stressing important words (Froger)
2. Indicating solemn intonations (Baralli)

Office:
3. Formal: the first syllable of pentasyllabic cadences at the end of responsory verses of the fifth mode (De Loos).

Although these functionalities may explain some occurrences of microtones, a common rationale is missing.

* * *

The major part of the discussion about whether microtonal inflections were part of a medieval performance tradition has centred around a manuscript in which the crucial signs are symbols amidst letters representing diatonic pitches. No one has contested that these special signs represent some kind of sonic phenomenon, but doubts about whether they relate to pitch or to another musical characteristic remain persistent. If related to pitch, the positions of the special signs concur with enharmonic pitches, which would result in intervals smaller than a semitone. The majority of authors who dealt with the phenomenon directly confirm this assumption, while others are inclined to confirm it. Since the start of the twentieth century, representatives of the Abbey of Solesmes, the authoritative Catholic institution that has contributed immensely to the reconstruction of Romano-Frankish chant, deny the existence of a microtonal performance tradition; this has been done most eloquently by Froger in 1978. Although belonging to the minority camp that denies microtones, his authority still keeps most musicologists from referring to microtones without adding "presumed" as epitheton.

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[139] Downey *et al.* 1997, xviii, fn 29.

Ferreira dissected Froger's arguments in a way that brought Huglo to the conclusion that musicologists should get used to this phenomenon, but 'Solesmes' never published a reaction to Ferreira's interpretation. What remained underexposed thus far in the evaluation of Ferreira's and De Loos's contributions to the discourse are qualitative aspects of the new, younger sources with neumes on a staff, which they introduced for comparison. In these manuscripts, the neumes on a staff add iconic qualities to *in campo aperto* notations of the sources on which the debate had thus far been based.

Neither De Loos nor Ferreira seriously addressed the question of *why* microtonal inflections were employed, whereas Froger did just that. He was not satisfied with merely rejecting microtones but tried to find melodic patterns that could explain the context of the special signs, hoping that this would shed light upon their signification. That attempt failed.

CHAPTER II

EXPLORATORY ANALYSIS

"Seeing they do not perceive
and hearing they do not listen
nor do they understand"
Matthew 13:13[140]

"You only start seeing it once you figured it out"
Johan Cruijff[141]

This chapter is devoted to the exploratory analysis and its initial findings that led to the discovery of the rhetorical functions of non-diatonic inflections. It concentrates on the sung liturgy of Mass, with an excursus to the Office in the second part. The first two paragraphs describe how my tentative musicological analysis shifted towards a text-related inquiry for functionalities (paragraph II.1.) and how rhetoric surfaced as a functional foundation for microtonal inflections (paragraph II.2.). After an introductory paragraph about rhetoric in the present context (paragraph II.3.), the subsequent texts focus on how microtonal inflections and rhetorical triggers relate, illustrated with examples taken from the sample (paragraphs II.4.1. – II.4.3). The sample consists of 343 microtonal cases in Mass chants of all genres as observed in the six selected manuscripts. APPENDIX V provides full details about these cases. This part about the Mass chants concludes with remarks about the interpretation of the quantitative material of this analysis and a number of related charts (paragraph II.5.).

Second, I will leave the context of Mass by touching on the employment of non-diatonic material in Ult2, an Utrecht Antiphonary from the twelfth century (paragraph II.6.). It appears that the findings for Mass apply to the Office as well, but with added elements of style. Furthermore, my investigation indicates that the rhetorical triggers also underlie the thirty-eight employments of the *littera significativa* 's' in this manuscript, contrary to previous scholarly attempts to typify them as pitch corrections with a modal

[140] Matthew 13:13, New Revised Standard Version Catholic edition.

[141] "Je gaat het pas zien als je het doorhebt" a quote attributed to Johan Cruijff. Winsemius 2015, 73.

background. The letter ‘s’ predominantly appears at positions that coincide with the non-diatonic pitch of the chromatic genus, but no decisive arguments for this theoretical link could be found.

II.1. First Findings

The current state of Romano-Frankish chant’s microtonal analysis is somewhat confusing. On the one hand, Jacques Froger’s palaeographical analysis of the Dij special signs ends with denying their microtonal meaning. In vain, he tried to improve the insight into this for many musicologists still enigmatic phenomenon by searching for possible cadential functionalities of the signs. On the other hand, about two decades later, the analyses by Ike de Loos and Manuel Pedro Ferreira convincingly showed the existence of a microtonal performance tradition reflected in special signs and adapted neumes representing microtonal inflections. However, they hardly pay any attention to the possible functionalities of microtonal inflections. In the sung liturgy of the Office as notated in Ult2, De Loos observes some indications of microtonal inflections as a formal element, but a systematic functional analysis was beyond the palaeographical scope of her doctoral thesis. For Mass, Ferreira discusses several aspects of melodic embellishments when presenting his theory of melodic change but does not separately address the possible functionalities of microtonal inflections.[142]

What does ‘functional analysis’ mean in this context?[143] Functional analysis supports theory, in a number of ways. From a positivist point of view, on the one hand, it explains the cause of a phenomenon. On the other hand, it enables one to hypothesise in advance about the strength and direction of relationships among variables. Where possible, musicologists should support their theories with analyses that allow for these positivist functions. This includes falsifiability tests, often forgotten in the analysis of Christian liturgical chant.[144] Furthermore, it is essential that the relevant material be accessible at no

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[142] Ferreira 1997, 141ff.

[143] Cf. Buchanan 1998.

[144] Cf. Haas 2005, a review of Andreas Pfisterer’s Cantilena Romana and Schmidt-Beste 2008, a review of Kohlhaas 2001. Both reviewers seem to support the impressive number of examples supporting the analyses, both somewhat villainously objecting that other examples contradict the theories presented. On the other hand, Pfisterer criticises Manuel Pedro Ferreira for insufficient examples to support his theory.

charge whenever possible. Finally, the functional musicological analysis should grasp and present the essence of a phenomenon in a way that it makes sense for scholars, performers, and audiences / the public to learn about the results.

The confirmative outcome about the existence of a microtonal performance tradition as presented in Chapter I was presented as starting point to extend and redirect Jacques Froger's analysis. It is an extended approach because the sources introduced by Ike De Loos and Manuel Pedro Ferreira widen the chronological, geographical, and palaeographical scope of the phenomenon considerably; it is redirected because Froger's focus on the cadences for exploring possible functionalities of the special signs appeared to be a dead-end approach. While presenting my in-process analyses at conferences, I became aware that many specialists in the field still assume(d) that microtonal inflections could not 'possibly' have existed. That makes a discussion with arguments as presented quite complicated. Apart from an incidental "those signs could mean anything", my opponents and I could come to an agreement on the assumption that the Dij special signs and the adapted neumes represent a sonic phenomenon. The only aspect we did not agree upon was the sound. As a consequence, without abandoning my microtonal interpretation, I decided to shift the central analytical focus from the possible notational significations towards *why* these signs – interpreted as microtonal inflections *or otherwise* – were applied in liturgical manuscripts with different notation traditions for so long. How was it possible that a seemingly non-systemic melodic phenomenon was performed in north-western Europe from probably before the early eleventh century up until the fifteenth century? A different sonic interpretation of these signs does not alter the outcome of the functional analyses as presented in this thesis.

An analysis based on the sources consulted by De Loos and Ferreira – including Dij, upon which Froger's article concentrates – was obvious. The consequence of this choice is that the study mainly focusses on chants for Mass. For the Office, an exploratory analysis was limited to a small selection of chants as notated in the Utrecht manuscript Ult2. Six manuscripts underlie Ferreira's analysis: Montpellier H 159 (Tonary, Dijon, first half of the eleventh century), BnF PA Lat. 1087 (Gradual, Cluny, end of the eleventh century), BL Add MS 18031, BL Add MS 18032 (Missals, Stavelot, first quarter of the thirteenth century), Aachen G 13 (Gradual, Aachen, third quarter of the twelfth century) and ABM h62 (Missal, Utrecht, around 1200). More details about these manuscripts can be found in APPENDIX III. Ferreira, in the updated Appendix 2 of his doctoral thesis (2004), presents an ad random selection of ninety-five chants with microtonal inflections from

these sources. A sample of the same selection was used for the functional analysis presented here.

The case for microtonal inflections in Romano-Frankish chant is strongly supported not only by De Loos's and Ferreira's analytical work but also by the iconic, visual arguments contained in their sources: younger notations on a staff containing neumes that represent microtones. Contrary to the 1990s, when De Loos and Ferreira wrote their theses, nowadays, digital imaging has rather become a question of time and effort than of cost and computer capacities. At the start of this project, the manuscripts H 159 (Dij), BnF 1087 (Clu), and U 406 (Ult2) were already available online; BL Add MS 18031 and 18032 (Sta) were digitised upon my request. For the purpose of this thesis, the keepers of Aachen G 13 (Ach) and ABM h62 (Ult1) allowed me to digitise these two manuscripts. As a result, the images of all references to the manuscripts in this thesis can be accessed online via the digital version of the appendices.

Research started to explore the possible functionalities of microtones in Mass chants by expanding on Froger's unsuccessful analysis of Ult1. In the *responsoria prolixa* of the fifth modus in Ult2, De Loos observed a formal employment of microtonal inflections in Ult2. These will be discussed in paragraph II.7. For the same genre, in my Master's thesis about the Fragments NL-Uu HSS: Hs.Fr. 4.3., I (mis-)interpreted the repeated occurrence of microtonal inflections at the end of some first verse phrases as driven by formal considerations.[145] These findings led to the question of whether these formal and melodic patterns could be observed in verses of responsorial chants for Mass as well.

In Ult1, forty-eight responses and verses from offertories containing the adapted neumes were studied. In the ad random selection covering several modes, not once was a microtone found in one of the constellations mentioned above. Equally unsuccessful was the testing of links between the occurrence of microtones and the text-related elements of meter, accent, and the positions of words (syllables) in melodic phrases. Extending the analysis to the other selected Mass manuscripts, the same parameters were tested without success in introits, graduals, and communions. The extension of Froger's and Raffaello Baralli's functional analyses within musical contexts did not provide an explanation for the phenomenon.

[145] Lousberg 2013, 123.

In his 1978 article, Froger refers at the end of his analysis to Baralli's observation that the special signs frequently occur in "solemn intonations";[146] Froger also mentions that the special signs often seem to emphasize important thematic words. Baralli's observation could be rejected by the outcome of my expanded analysis. Because Froger did not further analyse his own observations regarding the connection between the special signs and text, the logical next step was to explore these possible functionalities of microtonal inflections. The working hypothesis was that the textual elements by their *meaning*, not by elements linked to musical qualities (openings, cadences, accents, meter, etc.), trigger microtones.

For this second attempt, the material assembled by Ferreira in the revised APPENDIX 2 of his thesis proved to be particularly adept.[147] It contains a list of the words with microtones in an ad random selection of ninety Mass chants from the six sources mentioned above. The appendix lists the word(s), the specific syllable(s) with a microtonal inflection, and the neume applied for each manuscript.[148] The header contains the genre, the incipit, and the page in the *Graduale Triplex* where the chant can be found (*fig.* II.1).

5.
Intr. *Dum clamarem* (G.T. 303)
Dij 433/37; Ult 41v; Sta 70v, ii-88v; Clu 27r; Ach 16v

	... ad **do**minum ...	TOR	Dij, Ult, Sta, Clu
20	... appropinquant mi**hi** ...	CLV	Dij, Ult, Sta^{ii}, Clu, Ach
	... et humili**a**vit ...	CLV	Dij, Ult, Sta, Clu, Ach
	... ante **se**cula ...	BIV	Dij
	... ante secu**la** ...	CLV	Dij, Ult
	... in eter**num** ...	CLV	Dij, Ult, Sta, Clu

Fig. II.1. Ferreira Annex 2 (2004), n.p.: Introit *Dum clamarem*

The first twenty words with one or more microtonal inflections were selected from each of the five genres for Mass as listed by Ferreira in the same order as presented in his

[146] Froger 1978, 178.

[147] Ferreira 2004, unpublished. This is a corrected version of the appendix with the same number as in his doctoral thesis.

[148] Ferreira also takes examples from Trier, Stadtbibliothek, 2254/2197. Due to the high number of lacunae in this manuscript, it was decided to not take this source into consideration for the present analysis.

sample.[149] Alleluias are missing in his sample, so in addition, six alleluias (containing a microtonal inflection in at least one of the manuscripts consulted) were chosen ad random.[150] As relations between the meaning of words might be of importance, the analysis included only full verses. This resulted in a sample of 139 words in which 343 microtonal inflections occur (see *table* II.1).

All Manuscripts				
Genres	Chants	Verses	Words	Occ.
Introit	5	6	23	64
Gradual	4	8	23	59
Alleluia	6	6	23	53
Tractus	3	8	22	57
Offertorium	3	8	29	63
Communio	7	7	19	47
Total	28	43	139	343

Table II.1. The sample of microtonal inflections.

II.2. The System

Attempting to create an initial system out of chaos, each word containing a microtone was parsed. In addition, initially rather unsystematically,[151] each word was labelled with whatever connotations came up for categorising the words (see *fig.* II.2 below). The red fields in this figure refer to online reference works, as explained in APPENDIX V. In a process that slowly developed from muddling through the compositions to systematically exploring them, the possible meanings of words containing microtones were categorised as follows:

1. *Dominus, Deus, Christus*: respect for / fear of the deity.
2. Personal, possessive, and relative pronouns relating to *Dominus, Deus, Christus*.
3. Nouns, adjectives, and adverbs expressing affects.

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[149] Ferreira's selection of communions has only 19 words with microtonal inflections. The
difference was considered to be irrelevant for the interpretation of the outcome.

[150] For details, see APPENDIX V.

[151] QD in the database fields as shown below refers to 'quod [erat] demonstrandum'.

4. Verbs in jussive mood and / or mandative subjunctive, expressing pleads and exhortations.
5. Coordinating and subordinating conjunctions underlining and / or linking important statements.
6. Undefined cases were initially vaguely labelled as 'exegetical' and 'mnemonic'.

Subsequently, the six categories of the initial analysis were rearranged into three:

- Words expressing affect (initially categories 1, 2, 3, 4)
- Exegetical / narrative references (initially category 6)
- Grammatical elements stressing the meaning of the syntactical units (initially category 5).

All MSS	Words	Occurrences Absolute	Occurrences %
Affect: microtonal inflections in affective words/expressions	75	195	57%
Loci: Microtonal settings in exegetical/narrative settings	53	125	36%
Logic: microtonal inflections in grammatical settings	11	23	7%
Total	139	343	100%

Table II.2. The first result of the exploratory analysis.

These three categories could be further reduced to the two essential elements of rhetoric: *movere* (1.*) et docere* (2. & 3.).[152] The outcome of the analysis seems to support the hypothesis that in the sources that were consulted for Mass, without exception, textual meanings trigger microtonal inflections. As sonic markers, microtonal inflections accentuate the concerned words, in many cases highlighting additional text layers in texts that all participants knew by heart. Rhetoric was the common frame of reference for the composer, the performer, and the audience.

[152] Next to 'docere' and 'movere', rhetorical treatises mention 'delectare', 'to please' or 'to praise' as a possible goal of rhetoric. 'Delectare' is aimed at the audience or a benefactor like an emperor or even a deity. When microtonal inflections emphasise addressing the Father or Christ (the Holy Ghost is not mentioned in the chants analysed), in nearly all cases they reflect aspects of "the fear of the Lord", mostly 'respect'. Given the rare occurrence of 'delectare' as an explanation for the presence of a microtonal inflection, a categorisation under 'movere' as 'praise' seemed to be more appropriate.

This tripartite setting of composing, performing, and listening was less prominent during the Middle Ages. As a consequence, it requires continual textual corrections when relating them to current perspectives about composers and performers. I decided to re-conceptualise this medieval overlap by applying the word *auctor*, the Latin word that, in the context of rhetoric, relates to the person who is writer-performer of an oration.[153]

II.3 Rhetoric

In theory, online encyclopaedias have the advantage of being more quickly updated than their paper predecessors. However, other editorial considerations may mean that they are not as up-to-date as one would hope. Insights from the last twenty years about the relationship between music and meaning in chant apparently have not yet reached the editors of *Grove Music Online*. Under the heading "Rhetoric and music",[154] the Middle Ages are distinguished from the Renaissance by a general tendency during the former period to emphasize formal elements, whereas the authors observe a trend to convince by way of affective strategies during the latter. They assume that "[p]oints of direct contact between rhetoric and music are […] difficult to identify" and that "[t]he obscure relationship between medieval grammar and rhetoric makes it difficult to identify a specifically rhetorical strategy in either the theory or the repertory of chant." This seems to neglect findings by Godehard Joppich, Rebecca Maloy, Emma Hornby, and Dirk van Betteray, just to name a few distinguished authors in this field. I will return to the results of these researchers in Chapter IV.[155]

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[153] An alternative would have been Franz Karl Prassl's "scriptor interpres": Prassl 2004.

[154] Wilson *et al.* n.d.

[155] Joppich 1991, Maloy 2010, Hornby 2009b, Van Betteray 2007.

Fig. II.2. A record from the exploratory analysis.

In this section, the rhetorical workings of microtonal inflections in medieval liturgical contexts will be addressed by first giving this musical phenomenon a place in the wider (verbal) rhetorical contexts of late-classical and medieval Christian traditions. After this introduction, I will explain and illustrate, with examples drawn from the sample, which

affectional issues the *auctores* address in order to achieve the intended *movere*. Subsequently, I will illustrate how the *auctores* highlight textual elements related to logic and *loci* – both reflecting aspects of *docere*.

Rhetoric is the technique and art of *bene dicere*, or of saying things well. In the educational framework of medieval higher education, it belonged to the *trivium*, intertwined with grammar (*ars recte dicere,* the art of saying things correctly) and logic. It is one of the three ancient arts of discourse developed in Greek and Roman classical cultures aiming to inform, persuade, or motivate audiences by a presentation of the text that convinces both logically (*docere*) and by affect (*movere*). From early on, the Christian Church accepted this 'secular' token of persuasion. In his *De doctrina christiana* (397-426), Augustine extensively propagates rhetoric, in order to convince audiences of Christian teachings.[156] His presence in the *loci* found in the sample is overwhelming.

Historians seem to agree that – based upon the surviving number of manuscripts – the works of four classical authors dominated the medieval rhetorical scene: *De inventione,* (*c*80 BCE) and *De oratore,* (*c*55 BCE), both by Cicero; parts of Quintilian's *Institutio Oratoria* (*c*95 CE); and Consultus Fortunatianus' *Ars Rhetorica* (fifth century, written before 435 CE). From the late eleventh century onwards, *Ad C. Herennium de ratione dicendi ("Ad Herennium"*, *c*86 BCE) seems to have become the most popular source for rhetorical instruction.[157] In addition, Mary Carruthers underlines the earlier importance of *De nuptiis Philologiae et Mercurii* by Martianus Capella (first part of the fifth century CE).[158] According to Frances Yates, Quintilian's *Institutio oratoria*, the most detailed classical treatise about rhetoric, had a rather limited impact during the Middle Ages due to its assumed fragmentary transmission at that time.[159] Late classical Christian rhetoric reached its peak in the teachings of theologian Jerôme (the translator of the Bible from Greek and Hebrew into Latin) and the theologian / philosopher (and professional

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[156] Murphy 1974, 57.

[157] Yates 1966, 54.

[158] Carruthers and Ziolkowski 2006, 18.

[159] Yates 1966, 56. The assumption of a partial transmission of Quintilianus is based on limited references to his writings prior to 1416, when a complete version of De institutione was discovered in the monastery of Sankt Gallen. This twelve-volume textbook is without doubt the most elaborate and clear instruction of its kind.

rhetorician prior to his conversion) Augustine of Hippo. Both Church Fathers lived during the first half of the fifth century.

After Augustine, when rhetoric was at its peak in the West, the art declined. In 410, the Visigoths sacked Rome and after them the city was attacked by the Vandals, who also took over Northern Italy, Gaul, and Spain. Boethius and Cassiodorus (both from around the first half of sixth century), whose works on rhetoric were widely read during the Middle Ages, were civil servants at the court of an Ostrogoth king, Theodoric the Great, who ruled Italy from Ravenna. During the seventh and the eighth centuries, Isidore of Seville in Spain and the Venerable Bede in Northumbria briefly mention rhetoric. However, according to Kennedy,[160] it took until the Carolingian Renaissance, inaugurated under Alcuin, for rhetoric to truly revive.

II.3.1. The Five Rhetorical Canons

None of the authoritative rhetorical treatises mentioned above or other sources in this field refer to microtones. In fact, almost no classical treatises on music or rhetoric are known to mention any functional links between pitches and performing rhetoric. There is one exception: a story about Gaius Gracchus (154-121 BCE) who is told to have had a flute-playing slave who by secretly giving signals on his instrument, 'orchestrated' a balanced performance of his master's public speeches.[161]

Lacking theoretical references, I had to give a place to the observed practice of microtonal inflections in its rhetorical context. The backbone of (late) classical rhetorical theory consists of five canons, although their definitions and delimitations differ more or less by treatise. They constitute a guideline to the orator's preparations for a speech up to its delivery: invention (*inventio*), arrangement (*dispositio*), style (*elocutio*), memory (*memoria*) and delivery (consisting of gestures - *actio* and pronunciation - *pronuntiatio*).

From a rhetorical 'point of hearing', microtonal intervals, by their non-diatonic pitch in a basically diatonic melodic context, seem to highlight the presence of specific meanings of words and / or passages in the biblical text. If rhetoric was the common ground for the *auctor* employing the microtone on the one hand and the audience perceiving this text

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[160] Kennedy 2011, 274.

[161] Ziolkowski 2010, 125. Ziolkowski quotes Valerius Maximus, also referring to Cicero, Aulus Gellius, Quintilian and Plutarch.

accentuation on the other, where should this sonic text marker be allocated in the canons? *Ad Herennium*, Book I introduces the canons as follows:

> Oportet igitur esse in oratore inventionem, dispositionem, elocutionem, memoriam, pronuntiationem. Inventio est excogitatio rerum verarum aut veri similium, quae causam probabilem reddant. Dispositio est ordo et distributio rerum, quae demonstrat, quid quibus locis sit conlocandum. Elocutio est idoneorum verborum et sententiarum ad inventionem adcommodatio. Memoria est firma animi rerum et verborum et dispositionis perceptio. Pronuntiatio est vocis, vultus, gestus moderatio cum venustate.[162]
>
> [The speaker, then, should possess the faculties of Invention, Arrangement, Style, Memory, and Delivery. Invention is the devising of matter, true or plausible, that would make the case convincing. Arrangement is the ordering and distribution of the matter, making clear the place to which each thing is to be assigned. Style is the adaptation of suitable words and sentences to the matter devised. Memory is the firm retention in the mind of the matter, words, and arrangement. Delivery is the graceful regulation of voice, countenance, and gesture.][163]

The first two canons, 'invention' and 'arrangement' relate to drafting larger parts of the text; microtonal inflections do not have an impact at this level. The fifth canon mentioned in *Ad Herennium*, 'delivery', refers to *aesthetic* qualities that can reinforce the message. Ulrich Müller analysed Quintilian's elaborations on qualitative and quantitative (dynamic) characteristics of the voice and their employment in the oration.[164] Drawing upon extensive text comparisons in Quintilian's work, Müller tries to find the correct modern translations for the applied performance terminologies. In such a context, the expressions *acutus*, *gravis* and *flexus* are unambiguously referring to higher, lower and bent pitches. One may easily add microtonal inflections to this canon, but from an analytical point of view, this does not provide any further insight into a systematic relationship between possible meanings of pitch in relation to the text. Linking microtonal inflections exclusively to delivery would fail to explain the essence of microtonal functionality as it has been observed.

Many of the audible underlinings made possible by *gravis*, *acutus* and *flexus* are 'lost in translation' when a text is sung instead of read aloud; when sung, their

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[162] Caplan 1964, bk I.3, 6.

[163] Caplan 1964, bk. I.II.3, 7.

[164] Müller 1969, 29–58, 105–124.

discriminating effects are dampened or erased by their – diatonic – melodic settings. This is not the case with microtonal inflections, which audibly stand out in their diatonic context and retain the distinguishing qualities that the other accents tend to lose when the text is sung. The discriminating function of microtonal inflections lies in a (primarily, or perhaps even completely) *non*-aesthetic link between sound and text messages. The two remaining canons, 'memory' and 'style', provide better reference frames for the functionality of microtones.

II.3.2. Memory

Bede, Cassiodorus, and Alcuin do not mention *memoria* in their treatises about rhetoric.[165] Nevertheless, as an 'awareness', one might say, memory was of essence when performing liturgical chants, and microtonal inflections were part of it. Wrongly citing liturgical texts was equal to offending God "and judged to be one of the greatest dangers that an individual could face."[166] Microtonal inflections had to fit into that formalistic concept; it is unimaginable that their workings would not somehow facilitate memory. Mnemonic elements are the structuring waypoints for the narrative. In verbal text, elements such as formal aspects, accents, and meter may all contribute to a mnemonic construct. In musical texts, rhythmic and melodic elements can additionally support memory.[167] When notation was introduced during the ninth century, good short-term memory remained of essence because notated chants were usually consulted before the service started.[168]

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[165] Yates 1966, 53.

[166] Ibid.

[167] The outcome of cognitive musicological research seems to confirm an ambiguous mnemonic contribution of melody in relation to remembering a text linked to it. Yke Schotanus evaluated a number of laboratory tests in the context of what he defines as the Musical Foregrounding Hypothesis (PhD thesis forthcoming), which states: "matching music to words has a similar effect to language perception as linguistic foregrounding." Schotanus 2015.

[168] This is suggested in Hucke 1988, 354. The consultation of manuscripts Ult1 and Ult2 leaves little doubt about their use before or during services. The staff in both manuscripts is 10 mm high and the neume-elements defining their performance are mostly smaller than 3mm. Try reading that in a Romanesque church by night or even by day. The pages of both manuscripts are well-thumbed, but lack candle-grease spots.

Recent articles about early notation point to strategies in which the exact representation of diatonic intervals apparently had a lower priority than, for instance, attention to dynamic aspects and tempo changes.[169] The striking notation of microtonal inflections in relatively early forms of notation is remarkable and could be interpreted as an indication for their importance in the performance of chant. The two sources in the sample with an *in campo aperto* notation, Dij and Clu, share this tradition in which the notation of microtonal intervals receives more attention than the notation of diatonic intervals. The Cluny Gradual has a notation of heighted neumes without lines with the limiting implications for defining pitches as described in the previous chapter; the microtonal inflections stand out by their symbolic 'flag' (*fig.* II.3 and *fig.* II.4*)*.

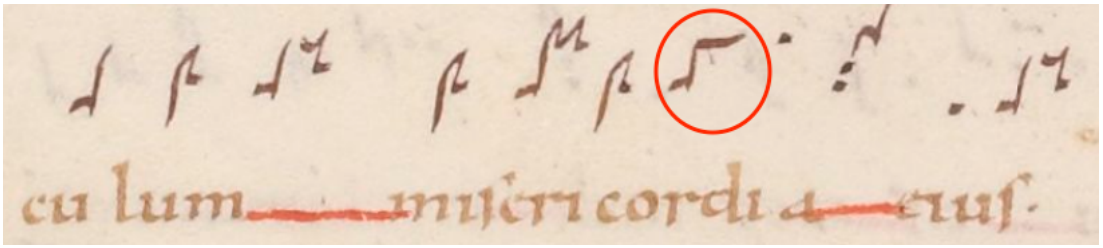


Fig. II.3. Clu, f. 35v *Confitemini*: Type 1 inflection.

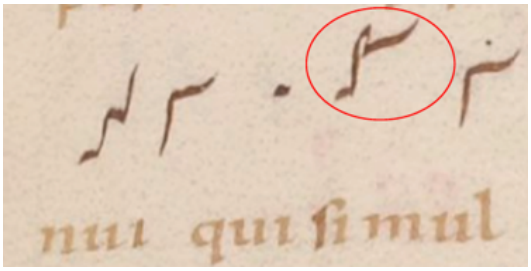


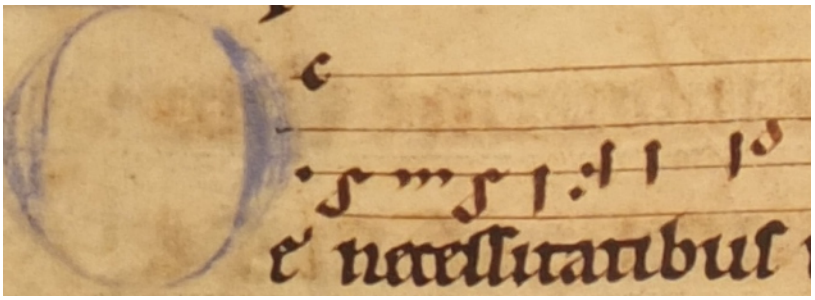
Fig. II.4. Clu, f. 53r *Improprium expectavit*: Type 2 inflection.

Eduardo Henrik Aubert shares Manuel Pedro Ferreira's microtonal interpretation of these adapted neumes, adding that there are two adaptations: Type 1, an adapted neume in which

[169] Rankin 2011, 105: "When a practical way of recording music in writing was invented in the early ninth century, it defined neither the pitches of specific notes in a melody, nor the intervallic relations between successive notes."

the last two elements are a vertical line and a horizontal line to the right; Type 2, an adapted neume similar to Type 1, although its horizontal line is not connected at the top of the vertical line, but rather positioned somewhat lower to the right (*fig*. II.4).[170] In the five other manuscripts that were consulted for Mass, these two adapted neume types coincide with neumes indicating microtonal inflections when notated on a staff.

Because the *in campo aperto* neumes in Dij could not reflect intervals precisely enough, the scribe – in addition to letters for the diatonic pitches – applied geometrical looking symbols, visually stressing the basic difference of these symbols representing enharmonic intervals. The Stavelot, Utrecht, and Aachen manuscripts consulted here have neumes on a staff (*fig*. II.5/6) including adapted neumes, distinguishing between whole tones, semitones, and quartertones.



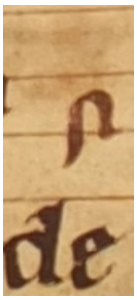


Fig. II.5. and **II.6.** Ult 1, 52r, *De necessitatibus*.
Two microtonal *torculi* and a whole tone *clivis*.

Notations – with their different limitations, or other focuses, until the present day – try to register the information that is essential for the eyes of the *auctor*: "[i]n each notation the reader is led along a path of recall, with more or less emphatic written signals provided as required."[171] If earlier notations were more the result of a choice of *what* to represent for memorising the performance of a chant than of the notational limitations, the employment of microtonal inflections may point to aspects of a notation tradition that was perhaps more focussed upon *modulandi bene* than upon *modulandi recte*, which was the leading principle for Guido d'Arezzo's reforms.

[170] Aubert 2013, 150.
[171] Rankin 2011, 105.

II.3.3. Style

Style relates to artful communication, to *how* the *auctor* presents his ideas in words, expressions, and phrases; in the present context, it also relates to microtones. On a word level, microtonal inflections contribute to the understanding of text messages, highlighting the rhetorical interpretations of the *auctor*. From the vast number of possible style figures,[172] microtonal inflections appeared to apply to only a fairly limited number of categories in the sample. This is understandable against the background sketched by Wolfgang Fuhrmann when citing Augustine, who underlines that the authors of biblical texts "*can* use all rhetorical devices effortlessly, but they do not *need* them to produce the grandest effect."[173] The 'Christian style' stood for what Erich Auerbach calls the *sermo humilis*.[174] Applied to the liturgy of the Church, Augustine states that it is *sine fuco*, "without make-up", and that it should reflect the simple style of rhetoric.[175]

If the ornateness of style is limited to simplicity, which relevant style qualities remain and how can microtonal inflections underline / highlight them? Cicero's and Quintilian's treatises agree upon clarity, correctness, persuasiveness (my translation of *evidentia* here), and propriety. Style implies the well-balanced employment of its qualitative elements. Clarity and propriety should reflect the level of style and should be simple in liturgy as well: clarity implies intelligible language for the audience. Correct grammar underlies the clarity of all texts; figures such as repetition and a moderate employment of figures of reasoning may contribute to clarity. Supporting *evidentia,* microtonal inflections contribute to the understanding of sung texts by emphasising the words that are crucial for understanding the messages in the text.

II.4. The Rhetorical Triggers of Microtones

My analysis of words and expressions with microtonal inflections in their melodic settings resulted in three main trigger categories: affectional triggers providing links for the rhetorical *movere*, triggers accentuating logical aspects, and *loci* (the latter two both linking to *docere*). In the sung liturgy represented in the sample, most texts are quotes or

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[172] See for instance Lausberg 1990.

[173] Fuhrmann 2011, 57. Italics by Fuhrmann.

[174] Auerbach 1958, 23-65.

[175] Fuhrmann 2011, 59.

paraphrases of psalm texts and the *auctores* employing microtones were very much aware of these texts when employing microtonal inflections. With a few exceptions – without excluding other patristic comments – the microtonal inflections found in the sources analysed seem to refer to Augustine's works, especially to *Ennarationes in Psalmos* (*c*410). The extensive, multi-level and partly meta-level references to Augustine's writings justify the expression 'microtones according to Augustine'.[176] The communities in which these liturgies were performed were imbued with psalm texts and patristic comments. All 150 psalms were sung each week. Their texts served as the basis for learning, reading, and writing during eight to ten years of monastic or clerical education; the patristic comments were heard during meals and in sermons. The level of connotative text knowledge was high and ever-present in the minds of nuns and brethren and even more so for monks and canons. In order to get a better impression of the connotative rhizomes that these patristic reflections touch upon by microtonal inflections, it seems justified to pay extensive attention to Augustinian comments instead of only referring to the passages in his writings in which a microtonal inflection appears in the melody. Such details are given in the examples below and in APPENDIX V.

Loci require additional explanation in the context of classical and medieval rhetoric. In classical rhetoric, *loci* are structuring waypoints for a coherent *inventio* of an oration as *modi agendi*; during the Middle Ages, the perception of rhetorical systems including the *loci* tends more in the direction of *modi interpretandi*, especially for the older layers related to the Proper of Mass where ritual elements prohibited changes in the text. The *loci* had become descriptive tools, ideal text elements to be accentuated by microtonal inflections. By consistently employing them, *auctores* codified *loci*, enabling educated prayers who participated in liturgy to receive their signals as intended.

Within the institutionalised textual and musical constraints set by the biblical texts and the diatonic framework of sung liturgy (as will be demonstrated below), the *auctor* could choose whether and where to employ microtonal inflections. Addressing the community's biblical connotative frame of reference, the *auctor* could add his own exegetical layer, omitting previous accentuations or adding new ones *ad libitum*. As a consequence of this facultative employment of microtonal inflections, a system was vital in order to create additional understanding quickly rather than causing confusion. The encoding of *loci* took place on a framework of *circumstantiae*, underlying the *accessus ad*

[176] To avoid any misunderstanding: as a characterisation, not as a definition.

auctores, a concept associated with Remigius of Auxerre (841-908).[177] The first-known system of *circumstantiae* is from Hermagoras of Temnos, a Greek rhetorician (*c*200 BCE), and reached the Carolingian scholars via Cicero and Boethius.[178]

For *circumstantiae*, the structuring questions proposed are: *quis*, *quid*, *cur*, *quomodo*, *ubi*, *quando*, and *unde* or *quibus facultatibus.* In our times, the same questions surface again in journalism and police investigations: who was involved, what happened, when, where and why did it happen. They are also presented as topics: *persona*, *res*, *causa*, *tempus*, *locus*, and *facultas* (means).[179] Microtonal inflections can emphasise textual elements that connect to these questions, support the memory of the *auctor* and guide the attention of the audience. Microtonal inflections accentuate these exegetical meanings either at the surface of the text or hidden within it. The familiarity with biblical texts and the contextual liturgical settings must have provided the background needed to receive the signals as intended by the *auctor*. In Chapter III, the semiotic contexts for the workings of microtonal inflections in Romano-Frankish chant will be explained.

In general terms, the *loci* in the sample relate to what Heinrich Lausberg defines as *loci argumentatorum*.[180] They were employed to all layers of the narrative, including biblical and non-biblical backgrounds of both *langage propre* and *langage figuré*. In the analysis of the microtonal inflections as employed in the Antiphonary Ult2, microtonal inflections also seem to surface in contexts where the soloist triggers subsequent action by the choir. Depending on the kind of observation, two terms for this rhetorical figure are possible. It could relate either to the visual observation in the manuscript then and now, or to what medieval singers experienced at the time. In the first case, a suitable term would be *loci a loco*: the observed microtonal inflection in the text is sung by the soloist and followed by the choir a few syllables later. The second case could be described by the expression *loci a tempore*,[181] where the members of the choir know it is almost their turn to sing once they hear the microtonal inflection sung by the soloist. *Loci a loco* can be applied in both medieval and later settings of observation and the term was finally chosen primarily for this consideration.

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[177] Copeland 1995, 66.

[178] *Ibid.*, 67.

[179] Copeland 1995, 66.

[180] Lausberg 1990, 211, §383.

[181] *Ibid.*, §§385-389.

A number of examples drawn from the sample and which refer to affect, logic, and *loci*, will be presented below. They will be specified in more detail where necessary. The psalms in the examples below have the Vulgate numbering followed by the Masoretic (Book of Divine Worship) numbering between brackets. Further comments and references have Vulgate numbering only. For other biblical books, the references are 'OT' (Old Testament) or 'NT' (New Testament), followed by further specifications. The bold and underlined syllables indicate the position of microtonal inflections. The blue words in these examples refer to words, expressions, and phrases analysed as 'emphatic' by Emma Hornby in her (diatonic) analysis of the second-mode tractus, to be dealt with and put into context later. The numbers between brackets after the manuscript references apply to the sequence of microtones if there are more than one in the same phrase. Here follows an example for the interpretation of this encoding:

ad de-fen-si-**o**-nem **me**-am as-**pi**-ce	Dij (1,2,3), Clu (2,3), Ult1 (1,2,3)

This example indicates that in Dij and Ult1, all three microtonal inflections occur whereas in Clu, they only occur in ***me****am* (second microtone) and *as****pi****ce* (third microtone). According to this encoding, there are no microtonal inflections in the Aachen and Stavelot manuscripts.

II.4.1. Affect

In the sample, more than half (57%) of the microtonal inflections relate to affect. Augustine's interpretations of affects provide enough background for interpreting the observations in the sample. He interprets four basic kinds of passion (desire, joy, fear, grief) as modifications of love.

> Amor ergo inhians habere quod amatur, cupiditas est, id autem habens eoque fruens laetitia; fugiens quod ei adversatur, timor est, idque si acciderit sentiens tristitia est.[182]

[182] The City of God Book 14.7:5. This is a simplified modification of love from Cicero's classification of passions, to which Augustine refers in verse 7 of the same chapter. The Latin Augustinian texts in the examples II.1. – II.9 are from the edition of Ennarationes in Psalmos edited by J.-P. Migne, Paris 1861. The corresponding English texts are taken from www.newadvent.org.

> [Love which strains after the possession of the loved object is desire; and the love which possesses and enjoys that object is joy. The love that shuns what opposes it is fear, while the love that feels that opposition when it happens is grief.]

In liturgy, any expression, word, or figure of speech may evoke affects. It may be the word and its delivery in the verbal context, the state of mind of the audience, or in sung texts, the additional connotations caused by (a combination of) melodic elements. From the sample presented in APPENDIX V, seven categories of affectional expressions could be listed:

1. Respect
2. Praise
3. Pleading
4. Sorrow
5. Repentance
6. Horror, disgust
7. Complaint

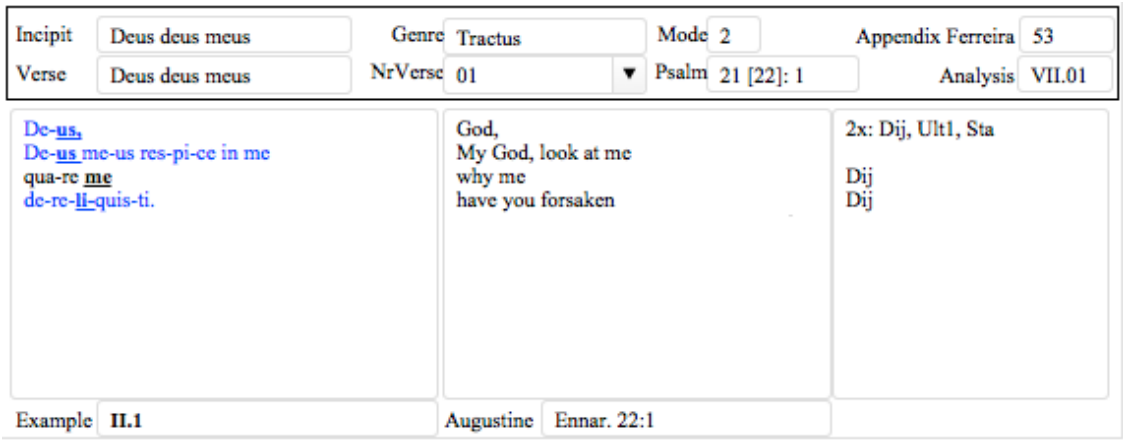
Like other analyses of medieval affects, this categorisation is open-ended;[183] in the sample, the categories frequently overlap. It is important to stress that the words are labelled in their context: *iniquus* (unfair, hostile), depending on its context, may express disgust or praise (e.g. in the sense that acts of God protect the believer). Where the affects were categorised as 'positive' or 'negative', 'pleading' was assigned to the latter because it expresses the requester's feeling that he misses something of essence.

Respect, Pleading, and Complaint

Deus (2), *me*, *dereliquisti*

Respect for the Lord (nowadays still "fear" in Dutch orthodox protestant psalm translations) is reflected in microtones when the deity is addressed in expressions of praise or pleading, jussive verbs, etc. The microtone frequently appears in the melodic settings of *Deus* and *Dominus* in the nominative or ablative.

[183] Cf. Rosenwein 2006, 43.



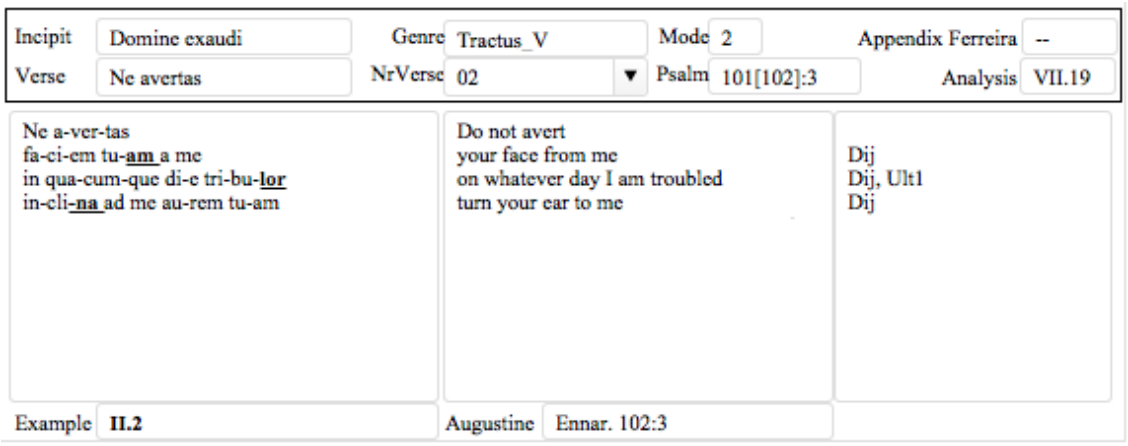
The microtonal inflections in the extended melisma on *Deus* can be interpreted as an expression of respect and pleading. The second microtonal inflection is more specifically intended as an introduction to the plea *respice in me*. The interpretation of the voice speaking in the text is of essence for the employment of microtonal inflections related to respect for the deity. As an example: in the tractus *Deus deus meus*, according to the patristic commentators, it is Christ at the cross who addresses his father.[184] *Me* refers to Christ and explains the employment of the microtonal inflection here. The microtonal inflection in *dereliquisti* reflects Christ's complaint. The *auctor* of Dij employs four microtonal inflections in this verse, which is quite a high number. It combines respect for Christ's sufferings with the utter misery of it, transmitted into the liturgy of the Passion, when this tractus is part of the liturgy.[185]

(*Faciem*) *tuam*

Pronouns (personal, possessive, and reflexive) referring to God, Christ and the saints may receive microtonal accentuations that express respect, as illustrated in example II.2 below, *faciem tu**am***.

[184] Neale *et al.* 1874, vols I, 281.

[185] The Latin Augustinian texts in the examples II.1. – II.9 are from the edition of Ennarationes in Psalmos edited by J.-P. Migne, Paris 1861. The corresponding English texts are taken from www.newadvent.org. The psalm numbering between square brackets refers to the Masoretic numbering, amongst others applicable to the numbering of Augustine's comments in the Ennarationes.



Tribulor: sorrow (see example II.5).

Augustine:

> Tribularis tu hodie, ego tribulor; tribulatur alius crastino, ego tribulor; post istam generationem alii posteri, qui succedunt posteris, tribulantur, ego tribulor; usque in finem saeculi, quicumque in meo corpore tribulantur, ego tribulor. 'In quacumque' ergo 'die tribulor, inclina aurem tuam ad me. In quacumque die invocavero te, cito exaudi me.' Hoc idem est. Iam nunc invoco; sed, 'In quacumque die invocavero te, cito exaudi me.' Oravit Petrus, oravit Paulus, oraverunt caeteri Apostoli; oraverunt fideles temporibus illis, oraverunt fideles consequentibus temporibus, oraverunt fideles martyrum temporibus, orant fideles nostris temporibus, orabunt fideles posterorum temporibus.[186]
>
> [You are in trouble this day, I am in trouble; another is in trouble tomorrow, I am in trouble; after this generation other descendants, who succeed your descendants, are in trouble, I am in trouble; down to the end of the world, whoever are in trouble in My body, I am in trouble....Peter prayed, Paul prayed, the rest of the Apostles prayed; the faithful prayed in those times, the faithful prayed in the following times, the faithful prayed in the times of the Martyrs, the faithful pray in our times, the faithful will pray in the times of our descendants.]

inclina: plea.

Augustine:

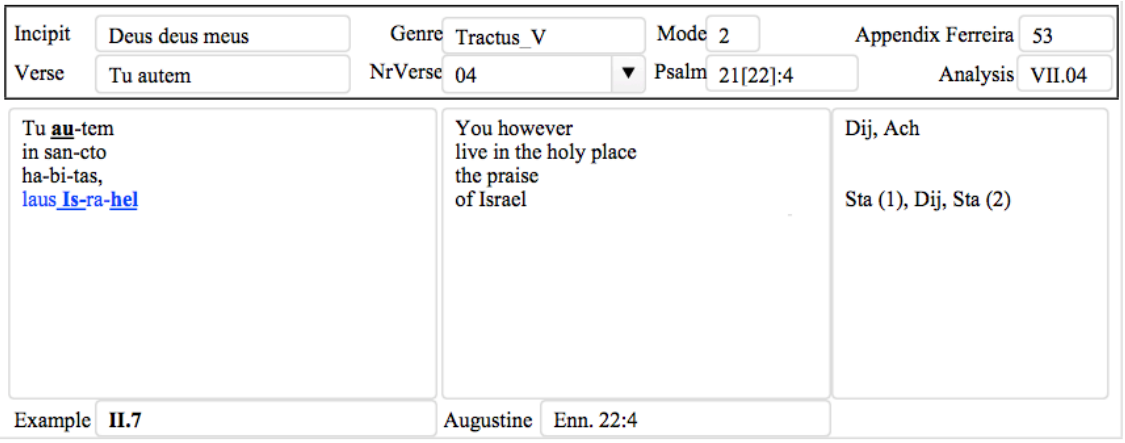
> Quando Deus a Filio? quando Pater a Christo? Sed propter membrorum paupertatem, Ne avertas faciem tuam a me. In quacumque die tribulor, inclina aurem tuam ad me.

[186] For bibliographical references in examples II.2 – II.9, see the footnote on Example II.1.

[When did God turn away His Face from His Son? When did the Father turn away His Face from Christ? But for the sake of the poverty of my members, turn not away Your face from me: whatsoever day I am troubled, incline Your ear unto me.]

Praise

Laus Israhel



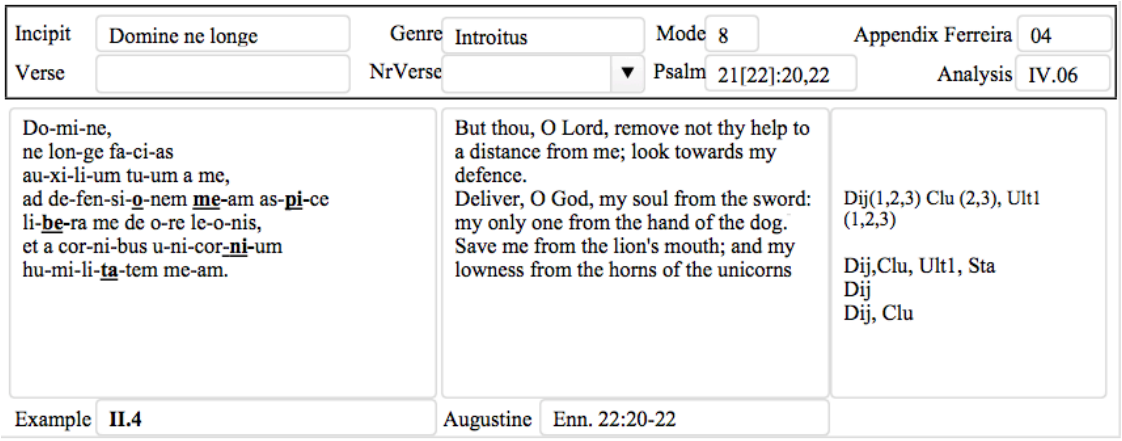
'Laus Israhel' is the praising metaphor for God. Augustine:

> Tu autem in sancto habitas, laus Israel et ideo immunda delictorum verba non exaudies.
>
> [But You dwell in the holy place, O Thou praise of Israel. But You dwell in the holy place, and therefore will not hear the unclean words of sins.]

autem: grammatical emphasis, see example II.7.

Horror, disgust

Unicornium

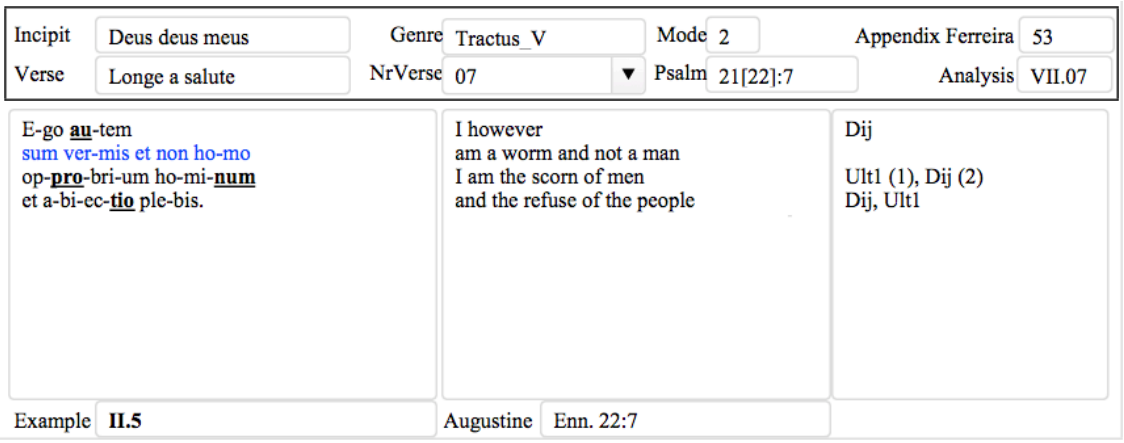


Horror is the severest variant of a whole range of terrifying concepts (reflecting disgust, fear, and anguish). In psalm texts, the unicorn, like the lion's mouth, may be a metaphor for evil.[187] Augustine's comment to the text of Psalm 21 refers to both metaphors. He links the lion's mouth only with the wickedness of the world in which believers have to live. He links the unicorn with pride, an excess of self-esteem (*superbia*) and one of the seven capital sins, which St. Thomas conceived as the root of all evil.[188]

> Salvum me fac de ore leonis: Salvum me fac de ore regni saecularis. Et a sublimitatibus superborum se singulariter erigentium consorteque non ferentium salvam fac humiliatatem meam.
>
> [Save me from the mouth of the kingdom of this world. And from the loftiness of the proud, exalting themselves to special pre-eminence, and enduring no partakers, save my humility.]

Sorrow

[Ego sum] opprobrium hominum, abiectio



The second clause of this verse sees three expressions underlined by microtones, of which *opprobrium* and *abiecto* express sorrow over humiliation. The voice of this psalm in all exegetical interpretations refers to Christ. *Hominum:* Augustine here underlines that Christ, though "himself without human generation in the flesh", was made the scorn of men:

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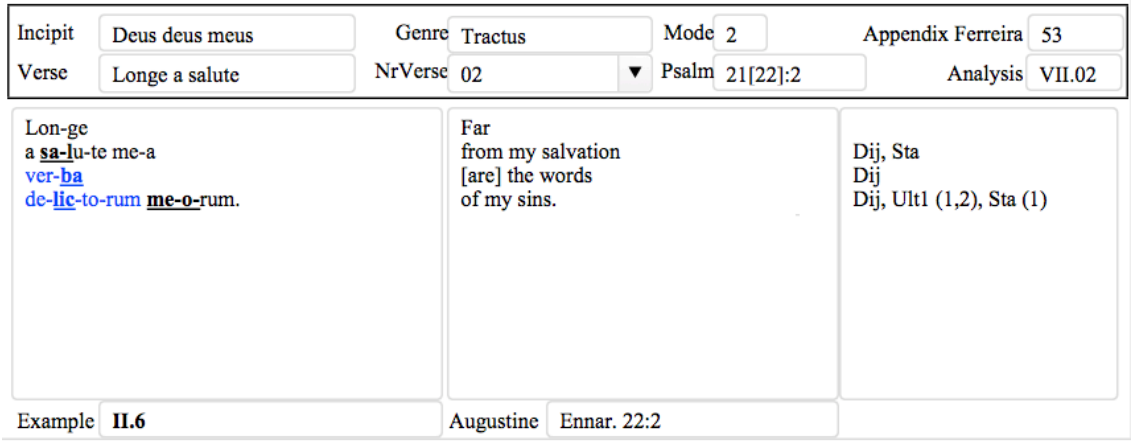
[187] Cf. Augustinus Ennarationes 21-22:22, Gregorius Magnus, Moralia in Job 15:4, Hrabanus Maurus, De universo: De pecoribus et iumentis 8:8. Like the lion, in other medieval contexts, the unicorn may signify Christ. Cf. Wriglesworth 2006, 30.

[188] Delaney 1911.

> Ego autem iam non ex persona Adam loquens sed ego proprie Jesus Christus qui semine in carne natus sum ut essem in homine ultra homines: ut vel sic dignaretur imitari humana superbia humilitatem meam.
>
> [But I, speaking now not in the person of Adam, but I in my own person, Jesus Christ, was born without human generation in the flesh, that I might be as man beyond men; that so at least human pride might deign to imitate my humility.]

Repent

delictorum meorum



On *salute* and *verba*, extensive patristic comments exist; both concepts are essential in Christian teachings. Concerning *salute* in this the psalm text, Augustine wrote "Why have you forsaken me far from my salvation?" *Quoniam longe est a peccatoribus salus;* for salvation is far from sinners. Contrary to the previous sentence, here Augustine interprets *'delictorum meorum'* as expressed by Christ:

> Nam haec verba sunt non iustitiae sed delictorum meorum. Vetus enim homo confixus cruci loquitur etiam causam ignorans quere cum dereliquerit Deus. Aut certe, longe a salute mea sunt verba delictorum meorum.
>
> [For these are not the words of righteousness, but of my sins. For it is the old man nailed to the Cross that speaks, ignorant even of the reason why God has forsaken him: or else it may be thus, the words of my sins are far from my salvation.]

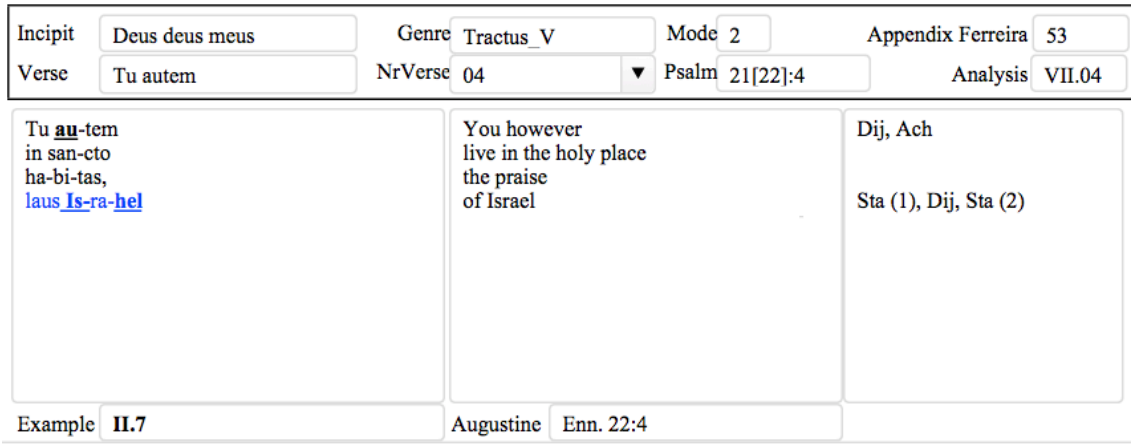
II.4.2. Logic

Conjunctions

In the sample, grammatically only 7% of the microtonal inflections relate to logic. It is the smallest rhetorical category. Microtonal inflections can be found in conjunctions such as 'however', 'and', 'but', 'because', etc. These microtones underline relations between

adjacent words, or words separated from each other by other words, sentences, or even verses; the microtonal inflections may overarch *cola et commata* in the text.

Autem



In the preceding verse 3, Christ addresses the Father without getting a response:

Deus meus	My God
clamabo	I shall cry
per diem, nec exaudies	by day and thou wilt not hear
in nocte et non	and by night, and it shall not
ad insipientiam mihi	[be reputed] as folly in me.

The patristic exegeses of (the preceding) verse 3 explain that God does hear pleas addressed to him, even if there is no response. Against this background, the *auctor* in verse 4 adds microtones under *autem*, a grammatical way to stress relief about the omnipresence of the Lord. He highlights *autem* with a microtone, stressing the contrasting transition from the texts of the preceding verses. Other examples of these conjunctions are microtones on the contrasting conjunction *sed* (but), non-contrasting, cumulative conjunctions like *et* (and, single or repeated) and on conjunctions presenting rationales *quoniam, quia* (because). *Ut* as a relative adverb is not highlighted by microtonal inflections in the sample, but will be found in other sources without any doubt.

II.4.3. *Loci*

In the sample, more than one-third (36%) of the cases relate to *loci*. Several narrative aspects, by *loci*, trigger microtonal inflections. Microtonal inflections can emphasise text elements that connect to *circumstantiae* and may support the memory of the *auctor* and guide the attention of the audience. Primarily, exegesis relates to the interpretation of what Barthes would call the *langage propre*: the highlighting of narrative elements in the text at their first level of understanding.

If, however, these waypoints have a biblical background (metaphors such as *laus Israhel, Jerusalem,* etc.) or are mentioned in the 'authorised' biblical comments by the Church Fathers, the microtonal inflections reflect what linguists refer to as *langage figuré*, the additional meanings of language beyond *langage propre*. Narrative references to daytime, night time, years, or longer periods up to eternity, as well as to proper names, cities, or regions without a biblical exegetical background can be interpreted as *loci argumentatorum*. They rarely occur in the sample.

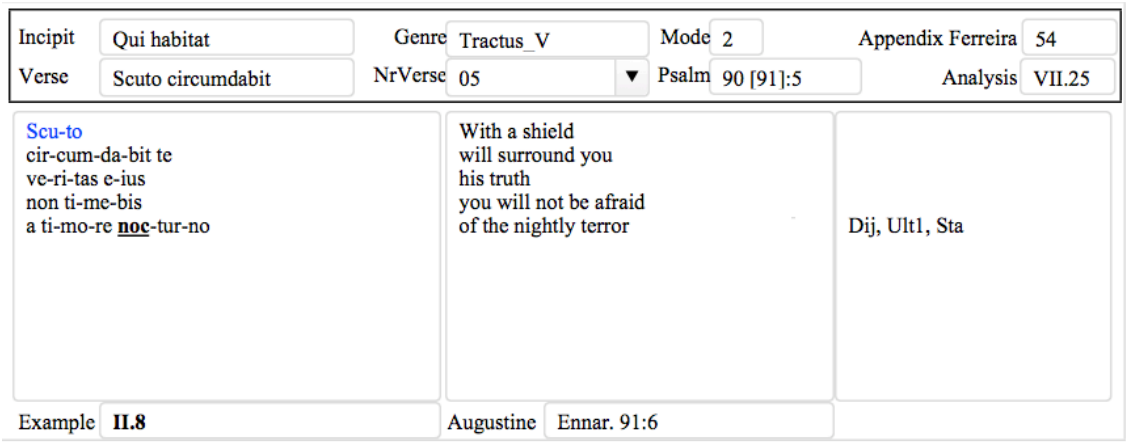
For better insight into the possible contributions of microtonal inflections to verbal text layers that contain exegetical levels, I dissected the overlapping elements in the category as much as possible. The broadest interpretations of the word exegesis are 'text interpretation' and 'close reading', to which a theological interpretation may be given a secondary role. In linguistic terminology, microtonal inflections may connect both syntagmatic and paradigmatic text elements. These multi-edged characteristics now make an explanation more complicated and fragmented than the former 'overall' experience, which was backed by a (professional) level of textual and melodic *gnosis* only few of us still have.

Biblical Exegesis

In the sample, the links between the microtonal inflections and liturgical text equal links between rhetoric and liturgical text. It reflects McKeon's observation that in the Middle Ages, rhetoric was seen amongst other elements as "the art of stating truth certified by theology".[189] In examples II.8 and II.9., by employing microtonal inflections, the *auctores* construct an ellipsis between verses 5 and 6 of *Qui habitat* by linking "You will not be

[189] McKeon 1942, 15.

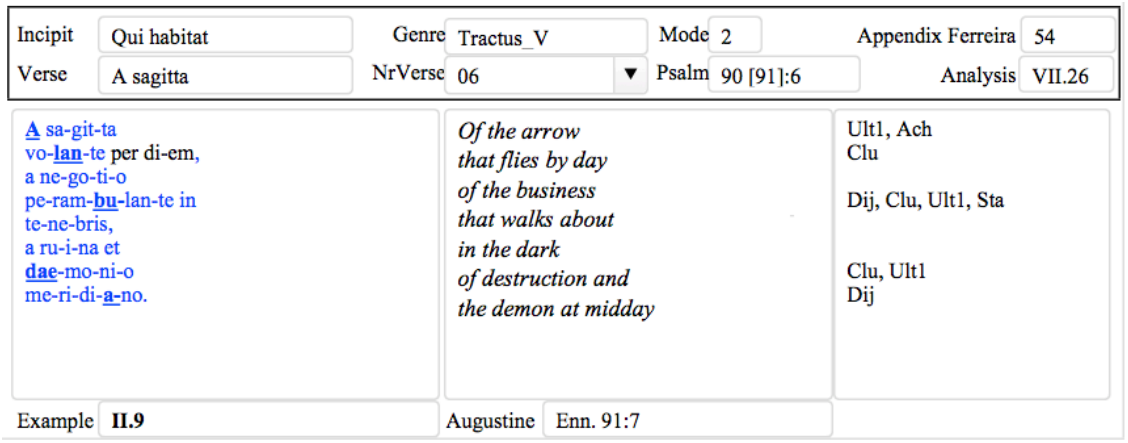
afraid of" – *non timebis* – in verse 5 to *a sagitta* in verse 6 ("Of the arrow" – the opening words of verse 6) and subsequently with *a negotio* and *a demonio*. This is one of the cases in which the microtonal inflections link words beyond the limitations of *cola et commata* (see example II.8). It is a good example of the sophisticated employment of microtonal inflections as text-accentuating tools and deserves a closer analysis.



Incipit	Qui habitat	Genre	Tractus_V	Mode	2	Appendix Ferreira	54
Verse	Scuto circumdabit	NrVerse	05	Psalm	90 [91]:5	Analysis	VII.25

Scu-to cir-cum-da-bit te ve-ri-tas e-ius non ti-me-bis a ti-mo-re **noc**-tur-no	With a shield will surround you his truth you will not be afraid of the nightly terror	Dij, Ult1, Sta

Example	**II.8**	Augustine	Ennar. 91:6



Incipit	Qui habitat	Genre	Tractus_V	Mode	2	Appendix Ferreira	54
Verse	A sagitta	NrVerse	06	Psalm	90 [91]:6	Analysis	VII.26

A sa-git-ta vo-**lan**-te per di-em, a ne-go-ti-o pe-ram-**bu**-lan-te in te-ne-bris, a ru-i-na et **dae**-mo-ni-o me-ri-di-**a**-no.	*Of the arrow* *that flies by day* *of the business* *that walks about* *in the dark* *of destruction and* *the demon at midday*	Ult1, Ach Clu Dij, Clu, Ult1, Sta Clu, Ult1 Dij

Example	**II.9**	Augustine	Enn. 91:7

Augustine in *Ennarationes ad Psalmos* 91:7:

> Tanquam scutum veritas eius est; ut non misceat eos qui in se ipsis sperant, cum eis qui in Deo spirant.
>
> [His truth shall be your shield, it is said: a shield to assure us that he will not confound those whose trust is in themselves with those who hope in God.]

Three commentaries emphasise the *timore nocturno*, or the 'nightly terror'. Considered separately, microtonal inflections in *nocturno* (last phrase in verse 5) and *daemonio* (penultimate phrase in verse 6) may make sense in an affective context as explained above.

It is not possible, however, to explain the microtonal setting of *perambulante* (verse 6, fourth phrase) and *meridiano* (idem, last phrase). The trained audience, however, noticed the attention the soloist asked for in the metaphors of evil via microtonal inflections: *timore nocturno*, *sagitta volante*, the *negotio perambulante in tenebris*, and the *daemonio meridiano.* The expression reflects a fearful phenomenon, but it has a second, exegetical layer. The terror by night is the first of four metamorphoses for the devil; in the next verse, verse 6, the other three personifications appear. Exegetes of the psalms explain them extensively.

By microtonal inflections, the *auctores* of the chants in the analysed sources as in a meta-comment even copy Augustine's observation about the relation between the clauses: "These two clauses correspond to the two below".
Augustine:

> Veritas autem Dei quae non personas accipit, discernit poenitentem a defendente, discernit humilem a superbo, discernit praesumentem de seipso a praesumente de Deo. Ergo veritas eius tanquam scuto circumdabit te. Non timebis a timore nocturno, a sagitta volante per diem, a negotio perambulante in tenebris, a ruina et daemonio meridiano. Duobus quae supra dixit, redduntur duo quae infra dixit. Non timebis a timore nocturno, a sagitta volante per diem: et propter timorem nocturnum, a negotio perambulante in tenebris et propter sagittam volantem per diem, a ruina et daemonio meridiano.[190]
>
> [But the truth of God, which respects not persons, discerns the penitent from him who denies his sin, the humble from the proud, him who presumes upon himself from him who presumes on God. You shall not be afraid for any terror by night. Nor for the arrow that flies by day, for the matter that walks in darkness, nor for the ruin and the devil that is in the noonday. These two clauses above correspond to the two below; You shall not fear for the terror by night, from the arrow that flies by day: both because of the terror by night, from the matter that walks in darkness: and because of the arrow that flies by day, from the ruin of the devil of the noon-day.]
>
> Quid est timendum in nocte, et quid in die? Cum quisque ignorans peccat, tanquam in nocte peccat: cum autem sciens peccat, tanquam in die peccat. Duo ergo illa leviora; ipsa sunt graviora, quae repetita sunt. Intendite, ut diligenter hoc, si Dominus annuerit, exponatur vobis: obscurum est enim, et erit magnus fructus si intellexeritis. Tentationem quae fit in ignorantibus levis, timorem nocturnum appellavit; et tentationem quae fit in scientibus levis, sagittam volantem per diem appellavit. Quae sunt leves tentationes? Quae non sic instant, non sic urgent, ut cogant, sed possunt cito declinata transire.[191]

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[190] This quote and the following: Augustine, Ennarationes 91:6,7,8. The corresponding English texts are taken from www.newadvent.org.
[191] Ibid.

> [What ought to be feared by night, and what by day? When any man sins in ignorance, he sins, as it were, by night: when he sins in full knowledge, by day. The two former sins then are the lighter: the second are much heavier; but this is obscure, and will repay your attention, if, by God's blessing, I can explain it so that you may understand it. He calls the light temptation, which the ignorant yield to, terror by night: the light temptation, which assails men who well know, the arrow that flies by day. What are light temptations? Those which do not press upon us so urgently, as to overcome us, but may pass by quickly if declined.]
>
> Quare autem in meridie? Quia multum fervet persecutio: maiores aestus dixit meridiem. […] Recte hic intelligimus daemonium meridianum persecutionem vehementem.[…] Exorto sole, inquit, aruerunt, quia non habebant altam radicem. […] Ut intelligatis Psalmum, quia daemonium meridianum propter aestum vehementis persecutionis positum est.
>
> [But why does he say, at noon-day? The persecution is very hot; and thus the noon signifies the excessive heat. […] The demon that is in the noon-day, represents the heat of a furious persecution. […] The sun was up; and because they had no root, they withered away. And when explaining it, He applies it to those who are offended when persecution arises, because they have not root in themselves. We are therefore right in understanding by the demon that destroys in the noon-day, a violent persecution.]

Patristic comments often refer to cases of the *langage figuré* of biblical texts. This explains why many microtonal inflections occur in metaphors. The microtonal inflections in the last two examples provide a good illustration of multi-layered meanings on the one hand and of the 'mutilating effects' of a fragmented modern analysis when looking at individual microtonal inflections on the other hand. The patristic explanations differ widely about precisely which evils these metaphors represent, but that is irrelevant here. Did the medieval *auctores* in the sources analysed, with the exception of the Utrecht *notator*, miss the four references to the devil? That seems highly improbable; a better explanation would be that the rhetorical guideline "beware of overkill" applied here.

It is possible to interpret the employment of microtonal inflections from different angles simultaneously, such as the double interpretation of the microtonal inflection on *A* (the first word of verse 6) as a grammatical / syntactical accent, both linking *non timebis* in verse 5 to the remaining metaphors in verse 6 (*sagitta, negotio* and *daemonio*) and stressing *a sagitta* independently. This is where the current analysis fragmentises a holistic concept of primary and secondary text meanings, accentuated by microtonal inflections.

II.5. Some Aggregated Data from the Sample

The sample is too small for a statistical analysis of the phenomenon as observed in the sources consulted; in addition, the material of the sample for this kind of analysis appears to be too heterogenic. This can be seen in two examples: apart from *Ostende nobis*, in Ult1, the other Alleluias are lacking; and in Ach, large parts of the notation were scraped and replaced with similar neumes without microtonal inflections. To conclude that microtonal inflections were employed far less in Aachen around the end of the twelfth century than in Utrecht one or two decades later would be a gross misinterpretation. The tables and figures below are only meant to summarize the observations. A much larger number of manuscripts would be required to define characteristics and developments, although the rhetorical explanations for the cases analysed remain valid.

Occurrences	**Dij**	**Ult1**	**Sta**	**Clu**	**Ach**	**Total**
Introits	16	17	12	13	6	64
Graduals	17	16	15	9	2	59
Alleluias	26	3	12	6	6	53
Tractus	15	14	16	6	6	57
Offertories	18	13	5	16	11	63
Communios	10	12	13	7	5	47
Total	102	75	73	57	36	343

Table II.3. A summary of the employment of microtonal inflections per manuscript.

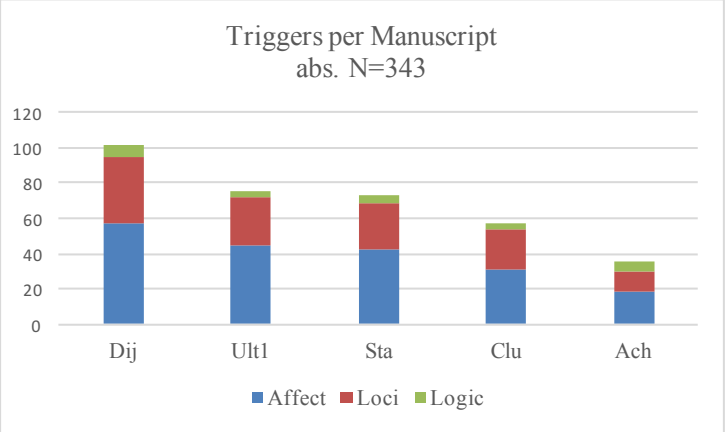

Fig. II.7. Rhetorical triggers per manuscript, absolute numbers.

Fig. II.7. shows the number of microtonal inflections employed per category and per manuscript. The ratios between the three categories are roughly the same for all sources (*fig.* II.8.).

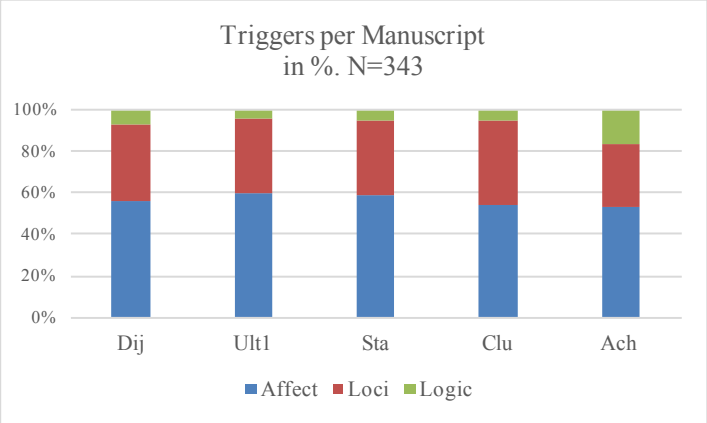

Fig. II.8. Rhetorical triggers per manuscript, %.

In the future, more and better material could enable scholars to bring facts to the surface, just as the palaeographical analyses, carried out by the school of Solesmes, did in the past. Nevertheless, on a more modest scale, some general observations prove to be helpful for further analysis.

The way in which microtonal inflections are employed in the sample reflects in essence a formulaic structure. Applied to music, the difference between a formula system and formulaic system is that the former consists of defined, fixed melodic combinations, whereas the latter refers to a system of constraints leading to defined combinations of melodic variants.[192] Most musicological analyses dealing with formulaic structures relate exclusively to formal *musical* issues. More recently, musicologists have noticed formulaic structures that are not triggered by melodic constraints but by textual constellations. A major part of chapter IV is devoted to this kind of extended formulaic structure.

The outcome of the analysis presented above seems to indicate that the element triggering the employment of the microtonal inflection in a formulaic context is textual, not melodic. From a textual point of view, the formal rules for linking microtonal inflections with text are characterised by a fair degree of flexibility, but all against the same systematic background. It is evident that the *auctores* of the sources consulted applied microtonal inflections differently in several ways:

[192] Treitler 2003, 168.

- During the analysis, it became apparent that expressions rather than individual words were the key to a systematic explanation of the employment of microtonal inflections.
- Sometimes, the microtonal inflection shifts from a noun or verb to the preceding pronoun or adverb supporting the same expression.
- If sources concur on the words (separate or in expressions) to which microtonal inflections are applied, the inflection may land on other syllables (see *fig.* 2.1 above, ***se****cula* and *secu****la*** in Dijon and *secu****la*** in Utrecht). The question of whether these shifts fit into strict rules of a microtonal grammar or are based on choices open to personal interpretation by the *auctor* will be discussed in Chapter IV.
- The warning against overkill, found in several rhetorical treatises, is crucial for the number of microtonal inflections. An accumulation of too many microtonal inflections would weaken the contrast with the diatonic framework. In the sample, about three sonic markers per verse appear to be a fairly standard maximum (see *table* II.4 below). The *auctor* must make choices in order to keep the microtonal inflections effective; there seems to be room for personal interpretation on where to position the microtonal inflection.[193]

Genres	Words	Verses	Ratio
Introit	23	6	3,8
Gradual	23	8	2,9
Alleluia	23	6	3,8
Tractus	22	8	2,8
Offertorium	29	8	3,6
Communio	19	7	2,7
Total	139	43	3,2

Table II.4. Average number of words with microtonal inflections per verse per genre.

In hindsight, this flexibility was the frustrating decisive factor in the previous functional research. Froger was discouraged because his analysis of the *musical* system did not reveal any functional relationship. How close he was to the interpretation presented here when citing Marie-Claire Billecocq who, referring to *litterae significativae* in Laon 239 states:

[193] Cf. Ferreira 1997, 163.

"[…] the Messine notator applied these letters inconsistently, 'only when he felt like it', one could say."[194]

II.6. An Excursus to the Microtonal Inflections and Chromatic Alterations in the Office

The analysis in this thesis concentrates on Mass books; the examples in this section were found in the liturgies of the Office, all from Ult2. They are most probably not more than a snapshot of the wealth of different regional traditions that are notated in Antiphonaries in the same centuries during which the consulted Mass books were written. In the present thesis, this exploration is an *excursus*, although the conclusions are as crucial as they are preliminary.

II.6.1. Microtonal Inflections in the Utrecht Office Tradition

According to De Loos, Romano-Frankish chant was teeming with microtonal inflections.[195] One of the obvious differences with microtonal inflections in Mass as analysed above is the employment of microtonal inflections in a formal setting, as observed by De Loos in the introduction to the CANTUS edition of this Utrecht Antiphonary. The formulaic employment of two subsequent microtonal inflections on the fifth penultimate syllable of the first verse of the *Responsoria Prolixa* of the fifth mode seems to reflect the rhetorical aspect of *loci a loco*:[196] the verse is sung by the soloist who

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[194] Froger 1978, 178: "Les tableaux de comparaison ont révélé que le notateur messin écrit ces lettres d'une manière inconstante, 'quand il y pense' pourrait-on dire". Froger refers to: Billecocq 1978.

[195] De Loos 1996, 195. In her dissertation, 173-177, De Loos describes 'hairlines' in Ult2 and in other manuscripts from England (BL, Royal 2 B 4) and Germany. By their position, De Loos is "tempted to assume a microtonal phenomenon" (176). Within the available time span for this thesis, I was not able to detect a functional system similar to the microtonal inflections yet.

[196] Referring to the repeated microtonal clives in this formula, from a palaeographical point of view, it is worth mentioning the notation in the fragments NL-Uu HSS: Hs.Fr. 4.3. Written in the Benedictine Abbey of St. Paul in Utrecht some 25 – 30 years before Ult2, the neumes in these fragments have a less contracted character. One of the examples of this trait is that repeated microclives in the Fragments surface as *virga strata* ('*franculi*') in the same chants in Ult2. In the Ult1 samples, *franculi* exclusively appear on c- and f-lines and in Ult2 almost exclusively on these lines. Incidentally, a *franculus*

with the microtonal inflections in this formula gives a cue to the choir to take over the chant at the *repetendum*.[197]

In the cases considered (in Ult2 there are 85 first verses of *Responsoria Prolixa*), the combination of two subsequent microtonal inflections is always situated in the cadence of the verse on the fifth syllable from the end. Textual triggers in some cases could apply, like a negative effect in *fig.* II.9. below ("***la****mentabatur*"), but apparently are coincidental since in the majority of cases, it is not possible to detect a rhetorical background related to textual meanings. More research will be needed to verify these superficial observations.

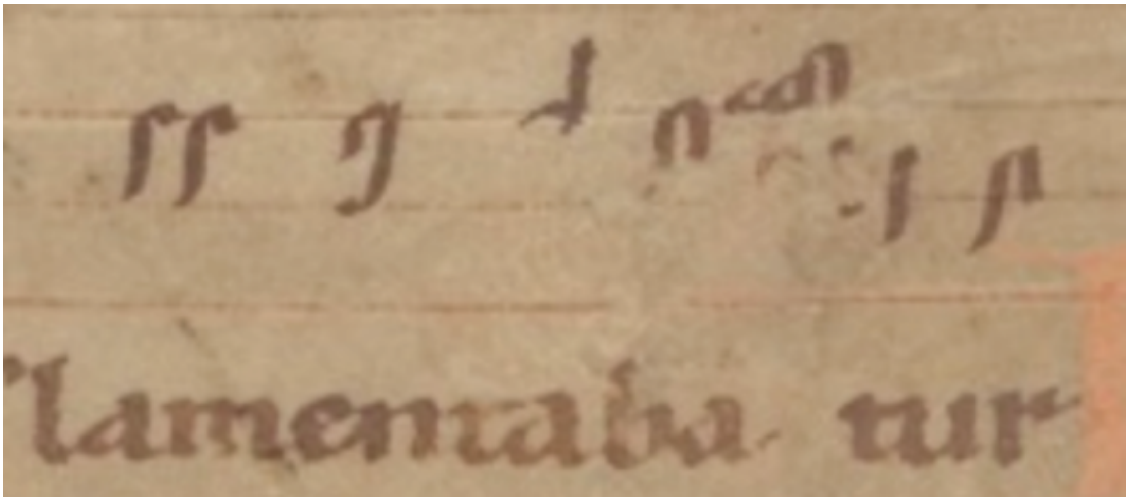

Fig. II.9. Ult2, 172r Cumque discederet vir, Lamberti.

The functional backgrounds triggering microtonal inflections in Ult2 were checked in the cases where they surfaced when analysing another generic phenomenon: non-diatonic semitones represented by the letter "s", which in the Sankt Gallen tradition is assumed to be shorthand for *sursum* or *semitonum*.[198]

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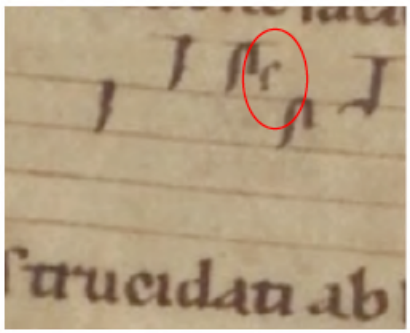
appears on a g-position: see 1) APPENDIX V, Analysis V.26, Sta 63v. 2) Fig. IV.10 plus text above it. The functional interpretation in the context of accentuation techniques might be that both the prolongation of the pitch concerned as well as a microtonal modulation of it result in the same effect: rhetorical accentuation of the related text. Assuming a rhetorical function of this adapted neume, both the rhythmic and melodic interpretations might apply, depending upon when and where in Europe it was written instead of an exclusive rhythmic interpretation as suggested by Eugène Cardine in *Sémiologie Grégorienne*.

[197] It may be prosaic and coincidental, but it seems that these *loci* a loco triggers only occur in the responsoria prolixa, sung at the wee-hours of the day.

[198] Froger 1962, 69f.

II.6.2. Semitonal Alterations: the Letter 'S'

In the contexts of contemporaneous notation traditions in the regions surrounding Utrecht, the *littera significativa* 's' in Ult2 is not unique, nor is it frequently employed in the latter. However, in the context of this pilot study it is significant enough to devote additional attention to it. De Loos in her dissertation refers to identical and similar notations in French and English Antiphonaries written during the twelfth and thirteenth century.[199] In an article she wrote in 1989, she shows that the letter 's' implies that the pitch linked to it should sound (a semitone) higher.[200] Containing more than 14.000 incipits, Ult2 comprises only 80 *litterae significativae*, of which the letter 's' with 38 occurrences is the most-employed letter, not counting its repetitions *in repetenda* in responsories or in hymn strophes.[201] Occurring mostly in responsories and antiphons throughout the liturgical year, they are employed in all modes.



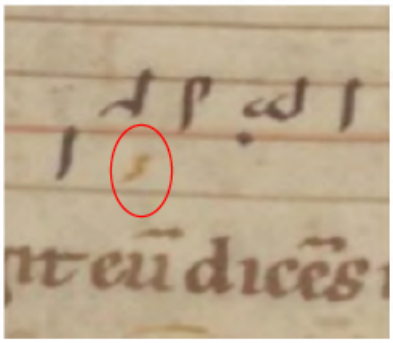


Fig. II.10 and **Fig. II.11.** Ult2, 33r and 50v respectively with high and low s.

The letter 's' is written as a high and low 's'. As both types are employed in different positions in the same formula that occurs eight times in antiphons (see below), the

[199] De Loos 1996, 183. She mentions Saint-Maur-des-Fossés (F-Pn lat. 12044), the Antiphonary St. Denis (F-Pn lat. 17296), and the Antiphonary kept by the Worcester Cathedral Library, siglum F 160.

[200] De Loos 1989. When checking, the 's' in the last chant listed by De Loos (Beata es virgo maria) could not be traced. Here 37 cases will be referred. Some accentuated pitches were interpreted differently.

[201] *Ibid.*, 6. The other letters are t (25 times), a (5x), e (4x), g (3x), u (2x), d (1x), and m (1x).

conclusion that they are interchangeable seems to be justified.[202] The *notator* chooses the most convenient spot in the notation to add the 's', which may be before or after the concerned pitch. The example of the low 's' on folio 50v shown in *fig.* II.11 is added by the *rubricator* with red ink below the pes; this is an unusual position. In *table* II.5, an inventory of the passages mentioned by De Loos resulted in 37 chants with occurrences of 's', in which the 's' is added to 'f' in 27 out of 37 cases; the other alternated pitches are e (4x), c (3x), a (2x) and g (1x).

De Loos referred to the present-day meaning of "chromatic pitches" in 1989;[203] nowhere in the text does she relate her observations to the chromatic genus. As for the microtonal inflections, it indeed seems too speculative to assume that theoretical concepts of Greek genera were in the mind of the *auctor*. Based upon the sources analysed, I tend to agree with Ferreira and Meyer that the awareness in medieval minds about a Greek theoretical foundation may have been limited, if exsistant at all. More details about possible other theoretical backgrounds will be presented in Chapter IV.[204]

A major difference between the employment of the microtonal inflection in the cases analysed and the employment of 's' is that the (downward) microtonal inflection is invariably connected to and preceded by its supersemitonal pitch. This is the reason for which De Loos denies the microtone a scalar pitch position, suggesting that 'inflection' would be a better definition. This does not always apply for 's' pitches, as they are also added to *puncta*, *virgae*, and *pedes*. Although the intervals resulting from the alteration as such are not as striking as microtonal intervals, they are nevertheless non-diatonic and as such distinctive in the context of the modes in which they are applied. Mostly employed in downward movements (g - f∂+ is by far the most frequently occurring pitch sequence), the 's' alteration does appear in upward formulas as well (see De Loos's examples numbers 3, 9, 14, 15, 26, 30, and 34 in APPENDIX VI). When an alteration results in e∂+, the following pitch is f, which suggests an upward employment of a microtonal inflection.

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[202] For details, see APPENDIX VI.

[203] That is seven years before De Loos published her PhD dissertation, in which she presents her views on non-diatonic intervals, referring to both the enharmonic and the chromatic genus.

[204] It is beyond the scope of this thesis to consider how the non-diatonic alterations were calculated in the monochord instructions analysed by Christian Meyer. The alterations indicated by 's' here are represented as [pitch]∂+.

Whether this was a common trait cannot be confirmed until more regional traditions are analysed.

De Loos tries to explain the 's' alterations from a modal angle: sharps were necessary in transpositions in order to keep the melodies 'logical'. Results that are 'illogical' according to this assumption are labelled as 'wrong' or 'mistaken by the scribe'.[205] Apart from the fact that the distance between twelfth-century Utrecht and the present time is too large to depend on what ears then might have conceived as 'logical',

[205] De Loos 1989, 7 and 9 resp.

De Loos Example Nr	Folio	Incipit	Feast	Office	Genre	Mode	Pitch Elevated	Neume	Result. Interval	Cantus ID
1	009v	Egredietur dominus de Samaria ad	Dom. 2 Adventus	M	R	3	g,e	CLV	g#-f∂+	006639 _
2	009v	Egredietur dominus de Samaria ad	Dom. 2 Adventus	M	R	3	f	POR	g-f∂+-g	006639 _
3	017r	Modo veniet dominator dominus et	Fer. 4 Hebd. 4 Adv.	M	R	6	f	VIR	d-f∂+-f∂+	007172 _
4	026v	In domino deo suo confisus	Stephani	M	A	7	f	CLV	g-f∂+	003226 _
5	030r	Apparuit caro suo Joanni dominus	Joannis Evang.	M	A	7	f	CLV	g-f∂+	001458 _
6	033r	Dicunt infantes domino laudem trucidati	Nat. Innocentium	M	A	7	f	CLV	g-f∂+	002211 _
7	046r	In domino laudabitur anima mea	Feria 2 per annum	M	V	5T	f	CLV	g#-f∂+	006237a _
8	050v	Cum autem descendisset Jesus de	Dom. 4 p. Epiph.	L	A	8	f	CLV	g#-f∂+	001985 _
9	052v	Egregie Christi martyr Sebastiane princeps	Fabiani, Sebastiani	V2	A	7	f	PES	f∂+-g	002614 _
10	057v	Propter veritatem et mansuetudinem et	Agathae	M	V	5	c	VIR	?-f∂+-f∂+	007883a _
11	061v	Cantemus cuncti melodum nunc alleluia	Dom. Septuagesimae	V	HV		e	VIR	g-f∂+-e	830058 _
12	063v	Benedicat terra domino et omnia	Dom. Septuagesimae	L	A	3	e	PCT	f-e∂+-g	001692 _
13	067r	Angelus domini vocavit Abraham dicens	Dom. Quinquagesimae	M	R	2	f	QUI	e-g-f∂+	006098 _
14	070r	Emendemus in melius quae ignoranter	Dom. 1 Quadragesimae	M	R	2T	f	VIR	e-f∂+-?	006653 _
15	083v	Pange lingua gloriosi proelium certaminis	Dom. de Passione	L	HV		f	VIR	f-f∂+-e	008367 _
16, 17, 18	088v	Conclusit vias meas inimicus insidiator	Fer. 2 Maj. Hebd.	M	R	6T	f,e,a	CLV,QUI,QUI	g-f∂+,?	006306 _
19	103v	Vidi Jerusalem descendentem de caelo	Fer. 4 Hebd. 3 Pasc.	M	R	1	f	CLV	g-f∂+	007876 _
20	110r	Si manseritis in me et	Philippi, Jacobi	L	A	7	f	VIR	g-f∂+	004901 _
21	112r	Salvator mundi salva nos qui	Inventio Crucis	V2	A	7	f	CLV	g-f∂+	004690 _
22	116v	Accipite spiritum sanctum quorum remiseritis	Dom. Pentecostes	L	A	7	f	CLV	g-f∂+	001234 _
23	120v	Te lucis ante terminum rerumque	De Regum	C	HV		f	CLV	g-f∂+	008399 _
24	122v	Dixitque David ad dominum cum	De Regum	V2	A	8	f	PES	g-f∂+-g	002313 _
25	125v	Descendit angelus domini ad Zachariam	Joannis Baptistae	M	R	7	f	PCT	g-f∂+	006409 _
26	126r	Gabriel angelus apparuit Zachariae dicens	Joannis Baptistae	M	R	5	a	VIR	a∂+-c	006757 _
27	131r	Ego pro te rogavi Petre	Petri	M	R	4	c	QUI	d-c∂+	006630 _
28, 29	156r	Ex odoris mira fragrantia sanitas	Inventio Stephani	L	A	7	f, f	CLV	g-f∂+	002745 _
30	160v	Beata es virgo Maria dei	Assumptio Mariae	M	R	5T	f	PES	e+-f	006165 _
31	171r	Consilium et opus suum semper	Lamberti	V	A	3	f	VIR	g-f∂+-g	200879 _
32	171v	Sanctum domini Lambertum ditatum honoribus	Lamberti	M	R	3	f	PCT	f∂+-f∂+	602137 _
33	186r	Concito cursu beatus Remigius civitatem	Remigii	L	A	8	f	CLV	g-f∂+	200844 _
34	195r	Visum est ergo viro dei	Willibrordi	M	R	6T	f	PES	e+-f	602518 _
35	196r	Summus sacerdos Willibrordus deo amabilis	Willibrordi	L	A	7	f	CLV	g-f∂+	204795 _
36	215r	In circuitu tuo domine lumen	Comm. plur. Mart.	M	R	5	c	TOR	d-c∂+-d	006891 _

Table II.5. Chants with the letter 's' in Ult2.

it appears that this explanation does not apply to all cases and some of the reconstructed transpositions are not convincing. This is the same problem that Froger encountered when trying to explain the occurrence of the five special signs in Dij by musical systems. It seems more likely that this non-diatonic alteration, like the microtonal inflection, was a tool to express something. Interpreted from a rhetorical perspective as suggested for the interpretation of microtonal inflections, the 's' alterations seem to indicate the same intentions by the *auctor* that are observed for the employment of non-diatonic intervals in Mass. (See *table* II.5 and APPENDIX VI).

In the Office, more non-diatonic material has been embedded in formulas, contrary to the Mass chants analysed here. In the examples in *table* II.6, the 's' alterations are embedded in a melodic formula (in between the vertical blue lines; pitches before and after may differ), which relate to words that reflect affects. The descending formula c-c∂- /c-b/c-a, rarely observed in the manuscripts for Mass, frequently occurs in Ult2.

Formula	
Incipit	**Accentuated Syllable**
In nomine deo suo	ad-**le**-ta stephanus
Apparuit caro suo iohanni	ihe-**sus** chrys-tus
Dicunt infantes	tru-ci-**da**-ti
Salvator mundi salva nos	per **cru**-cem
Accipite spiritum sanctum	re-mi-se-re-**tis** peccata
Te lucis ante terminum	so-li-**ta** clementia
Ex odoris mira (1)	sanitas e-**gro**-tis
Ex odoris mira (2)	lan-gu-**o**-ri-bus

Table II.6. The letter 's' in melodic formulas.

A rhetorical explanation of the cases in *table* II.6. (see APPENDIX VII) seems convincing, even though the anonymous Franciscan's assumptions in the prologue to *Cantuariensis* regarding a specific link between the chromatic genus and tropological exegesis as mentioned in Chapter I do not seem to be reflected in Ult2.

By the employment of more melodic tools, more variant pitches, and non-diatonic formulas, Ult2 seems to reflect a more 'baroque' style in comparison to the performance traditions for Mass as notated in both the older and younger manuscripts that have been analysed. This might indicate different non-diatonic traditions for Mass and the Office.

* * *

Jacques Froger tried to find a functional melodic or formal explanation for whatever sonic meanings the five special signs in Dij might have had. The present functional analysis strongly suggests a rhetorical tradition triggering the special signs in Dij and the adapted neumes (expressing the same sonic signal) in the other consulted manuscripts. Contemporaneous reports of reception and Christian Meyer's monograph about the monochord confirm non-diatonic performance traditions. These included enharmonic and other non-diatonic alterations which could point towards remains of a chromatic tradition. The foundations of this performative tradition are both the rhetorical principles as taught during the Middle Ages as well as the – to a high degree personal – choices of the *auctores* (subject to these teachings).

During a conference in 2010,[206] Manuel Ferreira presented his earlier research about the existence of a microtonal – what he then called a "primitive" – performance tradition, at the end (rhetorically) asking his audience to reconsider the arguments proving *how* this 'crime' was committed. In Ferreira's and Ike de Loos's steps, my research tried to unravel *why* the crime was committed. In Froger's eyes, there never was a crime.

The acceptance of an encoded *personal* interpretation of the text by the *auctor* in combination with the avoidance of rhetorical overkill led to a varied landscape with different regional or perhaps even local patterns of accentuations, amongst other techniques, by microtonal inflections. The *auctor*, by adding microtonal inflections, merely accentuated qualities present in the verbal text. He applies a tonal accent, a sonic marker that calls for *attention*, assumingly inviting the audience to further meditation. The latter link in the communicative chain relates to connotation and will be argued in Chapter III. In this respect, the music, when notated, seems to include a model for applying formulaic tools, whereby the grammatical constraints kept the performance completely linked to the diatonic core. It is questionable whether microtonal inflections ever touched

[206] Ferreira 2012, 156, 162.

an aesthetic nerve in the audience, perhaps apart from an admiration for the application of this rhetorical accent in line with its melodic and formal grammar.

Functional analysis provided a context for explaining the specific occurrences of non-diatonic pitches in Mass and in the Office. In a formulaic setting, triggered by the text, they offer the *auctor* the possibility of transmitting his rhetorical intention to his audience by an encoded signal. These qualities move in between verbal and musical planes, linking meanings stored in different text layers, sometimes highlighting affective words in the same layer, but separating them by the schemes of *cola et commata*. Often, they also reflect elements of the biblical *langage figuré*, explained by Augustine amongst other Church Fathers and in this case the microtonal inflection serves as a reference to these comments. But how exactly do these tools, these sonic markers, transmit the information as perceived by the *auctor* to the audience? What do they transmit by pitch and what is provided by shared textual knowledge?

The following chapter will explore how these markers can communicate meaning from a semiotic point of view, since musicological terminologies appear to be inadequate for systematically exploring the boundaries between musical and verbal texts and the processes bridging them together.

CHAPTER III

A SEMIOTIC APPROACH TO MICROTONAL INFLECTIONS

The functional analysis of microtonal inflections seems to reveal the latter's systemic relationship with text. Rhetoric, as a communication catalyst between *auctor* and audience, channels meanings evoked by microtones and conceptually limits the number of text-related choices. By categorising these rhetorical accentuations in Chapter II, it was possible to further specify the communication between *auctor* and audience on both the level of performance and its reception. The musical constraints for applying microtonal inflections will be explained in Chapter IV, but before going into the details of that side of the accentuation equation, it seems helpful to acquire more insight into the processes that actually link the verbal and melodic rhizomes for a plane of modified understanding. This was one of the most intriguing parts of my interaction with microtonal inflections.

This chapter starts by relating the microtonal-rhetorical model to more recent music and meaning models (not necessarily of sung liturgy). These younger traditions show a truncated rhetorical picture in comparison to models with microtonal inflections and similar earlier techniques, which will be presented in Chapter IV. However, the younger models serve as the background for many recent musicological interpretations of the music and meaning complex (paragraph III.1). From paragraph III.2 onwards, the structures and processes that define the transmission between text and microtonal inflections will be explained by way of 'applied semiotics'.

III.1. Models of Text and Meaning

The mechanism that microtonal inflections are part of, differs from younger musical tools intended to link music and meaning, such as word painting,[207] madrigalisms, *Figurenlehre*, *Affektenlehre*, and the Wagnerian *Leitmotiv*. Musicologists often feel uneasy when concepts of 'meaning' related to melody enter their field. An extended debate about absolute versus program music that started among German composers and publicists during the nineteenth century has definitely contributed to this attitude. Mostly related to

[207] Romano-Frankish chant has but a few examples of word painting. See Stevens 1986, 301.

instrumental (especially symphonic) music, the discourse continued deep into the twentieth century. Attempts to link melodic phrases or parts thereof to text elements in Romano-Frankish chant, following principles similar to *Figurenlehren* or based upon other techniques with aspects of *imitatio*, have not found general support.[208] Under the header 'The Tonic Accent', Willi Apel in *Gregorian Chant* discusses positions taken by Peter Wagner and Paolo Feretti regarding this accent in *Paleographie musicale*, published in 1892.[209] In essence, they state that important words stand out on higher pitches and that the employment of tonic accents, with certain exceptions, is in "the form of a strict and universal law". Apel disagrees, "because there are simply too many cases that do not agree with the law".[210] In addition, the definition of the tonic accent appears to be ambiguous. Apel illustrates his disagreement with numerous examples.

After an extensive analysis and comparison of previous studies, John Stevens concludes that the phrasal structure of the spoken text has strong parallels with its melodic structure. "To write out the text phrase by phrase without reference to the melody, following only the sound and the sense of the words, is to discover one has defined the melodic structure as well."[211] On a more specific level of relations,[212] including those of "important words", Stevens, like Apel, fails to see convincing arguments in research results leaving room for musical amplification of text in Romano-Frankish chant.

In her doctoral thesis, Emmanuela Kohlhaas quotes views about the music and meaning relationship in medieval chant as published in musicological German literature between 1970 and 1995.[213] She observes that Bruno Stäblein,[214] like Eugène Cardine,[215] without committing himself, in general terms describes the connection between text and music in Romano-Frankish chant as "text oriented". Jacques Handschin underlines the

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[208] *Figurenlehre* is an umbrella term for melodic figures to which literary ideas and figures of speech correspond, by definition of an individual composer. Many *Figurenlehren* exist. It was only in 1952 that an attempt was undertaken to catalogue all of these figures, cf. Schmitz 1952.

[209] Apel 1958, 289f.

[210] *Ibid.*, 290.

[211] Stevens 1986, 291.

[212] *Ibid.*, 296 ff.

[213] Kohlhaas 2001, 13f.

[214] Stäblein 1970, p. 37*.

[215] Cardine 1987, 12.

"liturgical function" of music in relation to text, whereas the latter has the higher authority.[216] In Kohlhaas's thesis, *Textvertonung* is a central issue. She suggests that amongst others, the relative positions of pitches and melismas have meaning. In spite of many examples, a systematic analysis of cases where this hypothesis is actually backed (and where it is not!) is lacking, leading to critical comments by Thomas Schmidt-Beste that in essence reflect Apel's comments on Wagner and Ferreti's statements about the same subject.[217]

Thoughts uttered by Karl Gustav Fellerer, Helmut Hucke, and especially Godehard Joppich were inspiring for the present analysis. To start with the latter, Joppich correctly states that in relation to Romano-Frankish chant, there is a decisive difference between *betonen* and *ver-tonen*; the distinction is between musically accentuating text (*betonen* in German) and musically expressing text (*vertonen*). In Romano-Frankish chant, cases of *vertonen* are extremely rare. In all its simplicity and compactness, this is exactly the difference between all the shades of *imitatio* implied in many publications about this subject contrasted with the assumed connection between microtonal inflections and text as this thesis demonstrates. Joppich argues that it would be better

> die Begriffe "Gesang" und "Musik" im Kontext des gregorianischen Gesangs zu vermeiden und zutreffender von "Klangwerdung" zu sprechen, vom "Klangwort", das aus dem "Redeklang" erwachse.[218]
>
> [to avoid the expression "chant" and "music" in the context of Gregorian chant, instead applying the more applicable *Klangwerdung* [becoming of sound], as a *Klangwort* [sound-word] which emerges from *Redeklang* [oration-sound].]

Due to its neologisms, this text is easily misinterpreted. Although I nowhere can trace any Deleuzian ideas in Joppich's publications, my translation of *Klangwerdung* in "the becoming of sound" seems to cover what Gilles Deleuze and Félix Guattari express in their concept of 'becoming':

> [B]ecoming is not to imitate or identify with something or someone. Nor is it to proportion formal relations. Neither of these two figures of analogy is applicable to becoming: neither the imitation of a subject nor the proportionality of a form. Starting from the […] function

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[216] Handschin 1985, 120.

[217] Schmidt-Beste 2008.

[218] Joppich 1995, 184.

> one fulfils, becoming is to extract particles between which one establishes the relations of movement and rest, speed and slowness that are closest to what one is becoming, and through which one becomes.[219]

Klangwort in this context has wider implications than *imitatio*, to which the interpretation could easily be limited. *Klangwort* in the present context may indicate any word with a meaningful sound, connected to affect, logic, and *loci* rather than to *imitatio*. Microtonal inflections have indexical qualities (defined below) that from the "oration-sound" lead towards "sound-words" with enhanced communicative qualities. It is the classical context of the oration that channels communication by rhetoric instead of by imitative concepts.

Hucke adds that apart from the adaptation of the melody to the text (in the sense of what Joppich later would underline as *betonen*) there remains "room for particular interpretations".[220] In 1972, before a number of significant publications were written about the content, chronology, and directions of the exchange between traditions north and south of the Alps, Fellerer formulated the following hypothesis:

> Im Rom war eine mittelmeerische Improvisationskunst und Modell-Tradition gewordene liturgische Kunst üblich, bevor im 7. Jahrhundert die "Gregorianische" Melodiefassung eine weiterreichende Tradition gründete. Dem variabelen Melodietypus sind Worte beigefügt, ohne daß – wie in der Gregorianik – die Schallform des Wortes mit der Melodiegestallt verbunden erscheint.[221]
>
> [In Rome, a tradition of Mediterranean improvisation and model-based [sung] liturgy had developed, before "Gregorian" melody settings established a tradition that found wider support during the seventh century. [In the former tradition,] [t]he variable melody types contain words of which the contours of the sound [Schallform] seem to be disconnected from the melodic line – contrary to the Gregorian tradition.]

From the perspective of newer insights, there is much to disagree with in Fellerer's views from 1972. Nevertheless, three elements in this quote, *mittelmeerische Improvisationskunst, Modell-Tradition* and *Schallform* – without Fellerer's context – appear to be seminal in light of the findings presented in Chapter II. They will surface again in Chapter IV in the context of a variant approach to the transmission of the older

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[219] Deleuze and Guattari 1987, 272.

[220] Hucke 1988, 311.

[221] Fellerer 1972, 185.

(Roman??) chant traditions to the younger traditions in the Carolingian culture. Scholars declaring *imitatio* as a principle for the interpretation of melodies seem to stress (in their inductive reasoning) the examples that seem to support their point of view, and in doing so, neglect cases that deny their interpretations. For Romano-Frankish chant, there is not enough proof that tools link words and meaning as in the younger examples mentioned at the beginning of this chapter.

Several more recent publications address the music and meaning complex by linking music to rhetorical and grammatical terminologies and concepts. *Imitatio* in any degree in medieval chant is not an issue in these models, but they do link certain notions ('grammar', 'rhetoric', 'music'), rather than words, melodies, syllables, and pitches, as became the case only from the thirteenth century onwards. These approaches conceptually set the scene for the explanation of the links between text and microtonal inflections as observed in Chapter II. In this context, Mary Carruthers – in *Rhetoric Beyond Words: Delight and Persuasion in the Arts of the Middle Ages* – pays extensive attention to the concept of *ductus*: "the way(s) that a composition, realizing the plan(s) set within its arrangements, guides a person to its various goals, both in its parts and overall."[222] By *ductus*, an interpreter (in both the active and passive meanings of the word) finds his or her way through and towards the (intended) messages of the text. "Finding a way" already refers metaphorically to roadmaps, highlighting certain perceptual points along the way towards understanding, and persuasion. In his *Ennarationes ad Psalmos* [41:9],[223] Augustine refers to the experiences of the psalmist by which he is led (*ductus*) towards God's Tabernacle:

> Tamen dum miratur membra tabernaculi, ita perductus est ad domum Dei, quandam dulcedinem sequendo, interiorem nescio quam et occultam voluptatem, tamquam de domo Dei sonaret suaviter aliquod organum: et cum ille ambularet in tabernaculo, audito quodam interiore sono, ductus dulcedine, sequens quod sonabat, abstrahens se ab omni strepitu carnis et sanguinis, pervenit usque ad domum Dei.
>
> [Yet it was while he marvelled [*miratur*] at the members of that company in the tent [*membra miraculi*] that he was led [*perductus est*] to God's house. He was drawn toward a kind of sweetness [*dulcedinem*], an inward, secret pleasure that cannot be described, as though some musical instrument [organum] were sounding delightfully [*suaviter*] from God's house. As he still walked about in the tent he could hear this inner music drawn by its sweet tones [*ductus dulcidine*], following its melodies and distancing himself from the

[222] Carruthers 2010, 200.

[223] Numbering in Carruthers 2010. In NewAdvent.org: 42:8.

din of flesh and blood [*strepitu carnis et sanguinis*], until he found his way [*pervenit*] even to the house of God.][224]

In different settings, *ductus* and its derivatives refer to guide, path, and directed movement; Carruthers summarises these references as "the flow of a composition".[225] It is very much a dynamic process that covers a number of 'music and meaning complex' issues, including all relevant issues of rhetoric in relation to the employment of microtonal inflections.

Under the umbrella of the *ductus*, in the same publication, Margaret Bent brings together concepts of rhetoric, grammar, and music.[226] Although Bent addresses late medieval polyphony in particular, much of it is relevant for earlier periods as well. Referring to Calvin Bower,[227] she demonstrates how models of grammar were linked to musical analysis and practice from the Carolingian times onward. According to Bent, the result was a new position of the melody in relation to the text. Melody was no longer exclusively a subservient embellishment of which certain structural elements were affiliated with the verbal text. It had become part of a process of exchange between text and melody, which becomes visible in polyphony. My analysis as presented in Chapter IV seems to indicate a contrary development. As far as the monophonic tradition is concerned, it shows a decreasing number of structural melodic elements related to text.

Fritz Reckow, acknowledging the same principles that establish relations between music and grammar as Bent does, stresses the increasingly normative position of grammar in relation to music.[228] As a consequence, the musical vocabulary includes words like "*ius* and *lex*, *regularitas* and *rectitude*, *error* and *vitium*, *peccare* and *depravare*, *corrigere* and *emendare* etc."[229] This reflects the vocabulary applied in Charlemagne's *Admonitio generalis* in which he urges the clergy to improve liturgical texts. Parallel to this major overhaul of the (liturgical) Latin language during his reign, a high priority was placed on the melodic uniformity of the sung liturgy. At the time, notation – apart from some accentuation signs – was, however, virtually non-existent.

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[224] Translation by Carruthers, 2010, 195.
[225] Ibid.
[226] Bent 2010.
[227] Bower 1989.
[228] Reckow 1982.
[229] *Ibid.*, 313.

Implementing the model Reckow sketches for the performance of chant, individual musical expressions had to yield to standardised, 'grammatically correct' formulas. A lower priority was given to rhetorically performing a liturgical sung text in a way that was convincing and moving for the audience. The importance of *modulare bene* decreased as it detracted from the standard, 'set by grammar': *modulare recte*. The affective and narrative rhetorical component in the musical *ductus* gradually diminished and would be increasingly taken over by *ratio*, by grammar, during the scholastic period. According to Reckow, it took until the thirteenth century before music theorists like Hieronymus de Moravia – without neglecting the grammatical rules developed since the Carolingian times – would introduce new models based upon *poetica*.[230] Hieronymus suggested evoking *affectus* and allowing for *irregularitatis* in order to move the audience (*movere animos*).[231]

For this later period, when polyphony in liturgical and secular music gained importance, Bent points to three aspects of relations between rhetoric and music that are repeatedly mentioned in treatises. First, similarities between rhetorical figures and music; second, similarities between formal aspects of a musical composition and an oration; and finally, "cases where the music is tailored to reflect certain words", in other words, *imitatio*:

> [M]usical rhetoric is usually understood mainly as what happens when words are purposefully set to music, and the music tailored to reflect those words, rather than cases where words are added to music that was composed without taking into them into account. Specifically, it connotes how music supports, underpins and reflects a primary verbal meaning, how it enhances or expresses verbal sense.[232]

Bent and Reckow both refer to relations between music and meaning on the level of models. They assume that in these models, relations between music and words become evident from the thirteenth century onwards. In the *poetica* model, the workings of rhetoric in comparison to the traditions analysed in this thesis are truncated to *movere animos*; references to logic and – for the most part – *loci* are lost. In spite of this, from a distance, it looks like the remains of the older tradition that allowed for rhetorical, musical

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[230] De Moravia 1935, 173ff.

[231] Reckow 1982, 318f.

[232] Bent 2010, 61.

accentuations of the texts bridged the *âge grammaticale*.[233] One of the early protagonists of the *poetica* model, Hieronymus de Moravia, is the same person who noticed the French clergy singing pitches of the three genera (see Chapter I); it is unclear whether he was aware of their rhetorical connotations, which may have well applied to the performers themselves. At about the same time, the Franciscan monk (who wrote a prologue to the *Cantaruensis* commentary on the Song of Songs) elaborates in detail on the links between the Greek genera and categories of biblical exegesis, although it is not clear yet whether they reflected existing traditions or whether they were phantasy.

As for the role of rhetoric in models of sung liturgy, my findings seem to indicate an earlier and far deeper involvement than assumed by Bent, Reckow, and others. This observation is in line with Mayke de Jong's and Irene van Renswoude's conclusions regarding rhetoric in secular settings during Carolingian times.[234] They contest the view held by those medievalists who assume that after Boethius and Cassiodorus, rhetoric disappeared because 'the Church' oppressed it.[235] 'The Church' consisted of many religious communities, monasteries, and episcopal courts, all of whom were tied to the court elites and families in power. Instead of centrally dominated communication channels, the discourses about secular and theological issues reflect a much more diffuse character. Underlining this character, De Jong and Van Renswoude point out that the public character of rhetorical debate from Augustinian times, assumingly pervading all layers of society, had become restricted to "palace-connected elites", which according to these historians applies to the rest of Alcuin's reforms as well.[236]

Before the grammatical model became dominant, the workings of rhetoric and microtonal inflections differed from the music and meaning constellations from later periods. The impact of the microtonal inflections had a wider scope, actually providing more *ductus* than music, grammar, and rhetoric could achieve from Early Modern times onwards. The model bridged two kinds of texts by musically linking, by microtonal

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[233] Reckow 1982, 311.

[234] De Jong and Van Renswoude 2017. If rhetoric reflects a tradition of the Carolingian elite at the time of Alcuin, does it refer to both verbal and musical texts? And if so, do the references in later chronicles about enharmonic microtonal inflections ("too difficult", disappearing "even from the court") refer to (former?) Carolingian elitist court traditions?

[235] *Ibid.*, 7.

[236] Ibid.

inflections, expressions of affect, logic, and *loci* on the one hand and the diatonic melodic main frame on the other. Below, the structures and processes of bridging will be analysed in more detail from a semiotic perspective. Applying a semiotic approach had several advantages for my analysis. By approaching the microtonal inflection from a semiotic angle, it became possible to systematically define microtonal inflections in their overlapping musical and rhetorical contexts, the two main rhizomes in this thesis. In addition, it facilitated the contextualisation of similar medieval musical techniques of accentuating verbal text in Gregorian chant,[237] as will be shown in Chapter IV.

III.2. Semiotics

The Oxford Companion to Music defines semiotics as

> [T]he general theory of how communication takes place. This requires 'signs' (Gk.: sēmeion, from where the word 'semiotics' derives), grouped together into 'texts' (which might include a musical score), and understood by means of a 'code'.[238]

Semiotics is the theory of signs associated with its pioneer, the American Charles Sanders Peirce (1839-1914). 'Semiology' is the name for the similar philosophy of logic as developed by the Swiss Ferdinand de Saussure (1857-1913). De Saussure's semiology has a stronger linguist tendency, whereas Peirce, in his study of Signs, gives more room for other fields,[239] including communication through images and sounds. De Saussure's dyadic concept of signification is based upon the signifier and the signified, two inseparable concepts, the signifier being the condition for the signified's occurrence and vice versa. For Peirce, *the explanation* of the relation between the signifier (in Peirce's terminology the Sign-vehicle) and the signified (the Object) – what he calls the Interpretant – is a separate and essential element for creating meaning by the combination of these three elements, which together constitute the Sign; his model is triadic. The Sign-vehicle can

[237] Here explicitly meant in the wider geographical context of this concept.

[238] Samuels n.d.

[239] Except for quotes, I capitalised Peirce's semiotic concepts to distinguish them from day-to-day uses, like 'symbol' and from other scholars (for instance when Eeco Tarasti refers to 'signs').

only exist if there is a link of understanding – the Interpretant – with the signified, the Object. Nowadays, many semioticians apply terminologies from both schools.
The present study, by drawing upon semiotics, seeks descriptions for phenomena involving music for which the musicological vocabulary is not fully equipped. The semiotic terminologies employed refer to the communicative processes that take place in liturgy in and between categories and groupings of signs in both verbal and musical texts. Within this strictly delimited context, it is possible to 'technically' define concepts such as 'musical sign' and the objects to which this sign may refer in order to derive meaning. Epistemological questions related to the issue of what a musical sign in wider contexts may imply, will not be addressed.[240]

The earlier quote from Jacques Froger's 1978 article about his frustration with the non-systematic occurrences of the special signs in Dij[241] is followed by a remark about the methodology of Gregorian semiology:

> It prevents us from relying on the notion of constant return by which we discover, by a normal method, the interpretation of a sign, as is done in Gregorian semiology. One can only reason on the presence of the facts found, without being able to contrast them with their absence.[242]

Jacques Hourlier introduced the term '*sémiologie grégorienne'* in *Études grégoriennes* in 1963. Subsequently, Eugène Cardine applied the same expression as the title for his famous analysis of early notations, *Sémiologia Grégoriana*.[243] In its introduction, he defines palaeography as "the analysis of the separate graphics and their shapes, their history and their geographical backgrounds."[244] He presents his approach as a semiological

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[240] See for instance Nattiez 1990 and Tarasti 2002, respectively.

[241] Froger, 1978, 175: "Cette inconstance dans l'emploi des symboles est très gênante pour l'étude de leur fonction."

[242] *Ibid.* "Elle empêche de se baser sur la notion de retour constant grâce à laquelle on découvre, selon une méthode normale, l'interprétation d'un signe, comme on le fait dans les recherches de sémiologie grégorienne. On ne peut que raisonner sur la présence des faits constatés, sans être en mesure de les faire contraster avec leur absence."

[243] Cardine 1968. References in this thesis relate to the French title *Sémiologie Grégorienne*, which appeared in 1970. Dij is one of the French manuscripts analysed by Cardine in this study.

[244] Cardine 1970, 1. "[L]'étude des seules graphies avec leurs formes, leur histoire, leur

method because, in addition to the melodic meanings of the signs, he includes the expressive elements represented by the notation.[245]

Cardine's choice has caused quite some confusion: *Sémiologie Grégorienne* and most publications referring to 'Gregorian semiology' in fact belong to the field of musical palaeography, as they exclusively refer to musical parameters of notation and how to perform them. For Cardine and his students,[246] the link to the performance of the signs represents the semiological aspect. This is a narrower perspective of semiology than what Leo Treitler referred to in 1987,[247] when he indicated how semiotics might help better understanding early notations:

> Such questions must lead to the study of notations in the light of their use in particular conditions: who uses them (that is, who writes and reads them), and for what purposes? What are their modes of representation? What was the conception of the musical objects that they represent? What sort of knowledge and competence did the reader require in order to be able to use them successfully? As we pose such questions the focus in the investigation of early notations must switch from palaeography to semiotics. Musical palaeography, which concerns itself with the classification of signs and the identification of their periods and places of use, has been a mature discipline since early in the last century. In the semiotics of musical notation, which would concern itself with the functional relationships between sign systems and what they signify while taking into account the situation of the person(s) to whom they signify, virtually everything remains to be done.[248]

Instead of creating a new 'non-exhaustive opposition',[249] I would have preferred to recycle Cardine's *sémiologie grégorienne* concept, adapting it to my observations in the seven analysed manuscripts. However, his concept is now understood and cited as an established

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répartition géographique."

[245] *Ibid.*, 2. To avoid any doubt: his palaeographical interpretation of the graphics leading towards interpretations of significations is exclusively based upon diatonic intervals.

[246] Organised in AISCGre (Associazione Internationale Studi di Canto Gregoriano).

[247] In 1982, Treitler already presented these ideas in his contribution to a conference organised by the CNRS: 'Paleography and Semiotic', in Musicologie médiévale: notations et séquences: actes de la table ronde du C.N.R.S. à l'Institut de Recherche et d'Histoire des Textes, 6-7 septembre 1982, ed. Michel Huglo (Paris: Librairie Honoré Champion Editeur, 1987).

[248] Treitler 2003, 329.

[249] Nelson 1993, 127.

type of musical analysis with a different perspective than that of semiology and semiotics. In addition, separately, both words pose problems. The role of the Interpretant, one of the methodological differences between semiology and semiotics, is of essence for the major parts of the present analysis, which pleads for a preference for 'semiotics'. In addition, during the last fifty years, both schools increasingly merged their approaches, the cooperation resulting in a recommendation to consistently apply 'semiotics' for the relevant fields.[250] Following this recommendation, I will refer to semiotics. '*Grégorienne'* nowadays is the collective name for Christian liturgical chant, of which Romano-Frankish chant is but a regional, and to a certain degree, chronological variant; I am unaware of microtonal inflections or similar techniques, for instance, in the Mozarabic and Ambrosian written traditions. For the time being, this regional restriction seems to be of essence.

As Jean-Jacques Nattiez observed, there is no single semiotic approach to music, but rather a selection of "possible semiotic projects".[251] The semiotic project s*émiologie grégorienne* does not provide the scope nor the vocabulary to explain the observations as presented in Chapter II.[252] Therefore, I had to find the applicable semiotic projects elsewhere. Most of the ideas proposed below are retraceable to Peirce and Umberto Eco.[253] Essential other contributions to my explanations include Eero Tarasti's concepts of pre-signs, act-signs, and post-signs;[254] furthermore, Philip Tagg's *Music's Meanings: A Modern Musicology for Non-Musos* provided inspiration for contextualising many concepts mentioned by Peirce and Eco.[255]

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[250] Eco 1976, 30: "[A]nyone inclining toward a study of sign systems that has no necessary dependence on linguistics must speak of semiotics. [….] [This is in line] with the decision made in Paris in 1969 by an international committee that brought into existence the International Association for Semiotic Studies.

[251] Nattiez 1976, 19.

[252] Which is no surprise since the scholars and editors of this school neglect if not completely deny microtonality.

[253] Eco 1976.

[254] Tarasti 1997, 15ff.

[255] Tagg 2013.

III.3. A Semiotic Approach of Word – Melody Relations in Romano-Frankish Liturgical Chant

The communicative process by which microtonal inflections seem to add meanings to Romano-Frankish liturgy can be summarised as follows:

- An *auctor* as composer or scribe stresses the meaning of a word or expression in a liturgical text to be sung by adding the enharmonic microtonal inflection *∂-* in the melody with a special sign or an adapted neume on a syllable of the word concerned.
- The *auctor* as performer inserts the enharmonic microtonal inflection into the diatonic melodic frame as a coded text marker for the audience.
- The *auctor's* act of musically highlighting the meaning of verbal text by a microtonal inflection is per definition a rhetorical act, comparable to other textual accentuations, i.e. an action in line with rhetoric as taught during the Middle Ages.
- In the sources examined and presented in Chapter II, 'meaning' relates to both content and form.
- 'Content' here refers to affect, logic, and *loci argumentatorum*; the microtonal inflections categorised under *loci a loco* relate to a formal cue.
- The audience decodes the *auctor's* intention from within the context of their interpretative traditions.

Starting with Peirce's triadic model of the sign, it was possible to formulate the decisive semiotic demarcations and links between the verbal and musical elements which constitute this process.

A triadic model of the Sign stands at the basis of Peirce's semiotics, consisting of

- the Sign (-vehicle) or Representamen (the form of the Sign);
- an Interpretant (the sense made of the Sign) and
- an Object (to which the Sign refers) (See *fig.* III.1.).

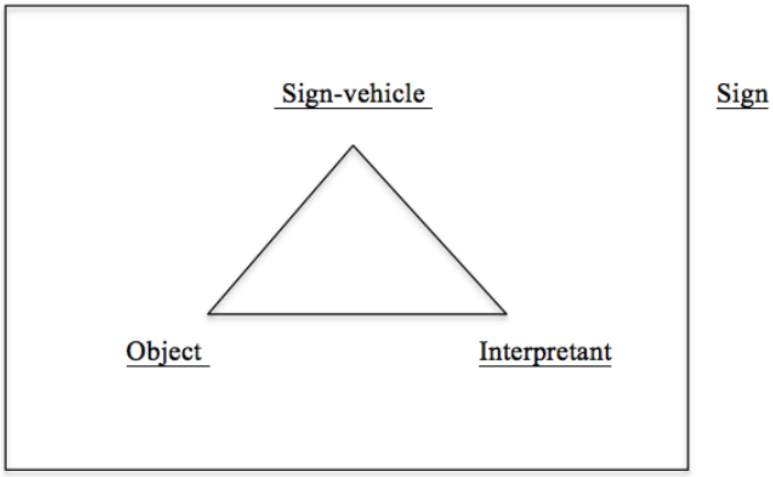

Fig. III.1. The essence of Peirce's triad.

This triad represents the Sign as a process of Semiosis: the process of interaction between the three elements of the model.[256] Peirce explains:

> A sign... [in the form of a representamen] is something which stands to somebody for something in some respect or capacity. It addresses somebody, that is, creates in the mind of that person an equivalent sign, or perhaps a more developed sign. That sign which it creates I call the interpretant of the first sign. The sign stands for something, its object. It stands for that object, not in all respects, but in reference to a sort of idea, which I have sometimes called the ground of the representamen.[257]

Peirce and many scholars commenting on him or applying his work often employ the word 'Sign' when they mean 'Sign-vehicle' (Peirce's alternative is "representamen", but he is not always consistent in applying it). I will distinguish between the "Sign", which represents the complete triadic model above, and the "Sign-vehicle", which refers to one element of it. Elsewhere, Peirce describes the three elements in Semiosis as follows:

> A representamen is a subject of a triadic relation TO a second, called its object, FOR a third, called its interpretant, this triadic relation being such that the representamen

[256] [B]y "semiosis" I mean […] an action, or influence, which is, or involves, a cooperation of three subjects, such as a sign, its object, and its interpretant, this tri-relative influence not being in any way resolvable into actions between pairs. Peirce 2007, 411.

[257] Charles S. Peirce 1958, II, 228.

> determines its interpretant to stand in the same triadic relation to the same object for some interpretant.[258]

The Object defines the Sign-vehicle; the Sign-vehicle intermediates between its Object and its Interpretant. The Sign-vehicle, in turn, determines an Interpretant, which may function as a Sign-vehicle in a subsequent triadic relation of its own. As the Sign-vehicle represents only certain aspects of its Object, there is room for additional Interpretants. In principle, this chain is infinite.

The interaction between the elements of Semiosis takes place on several levels; for analysing meanings, semiotics addresses signs by Semantics, Syntactics, and Pragmatics. Semantics concentrate on the relationship of signs to what they stand for; Cardine's *sémiologie grégorienne* is semantic. Syntactics cover the formal or structural relationships between Signs, which may belong to different kinds of texts, such as those encountered for the microtonal inflections. Froger's tentative functional analysis is an example of the musicological focus on *musical* Syntactical aspects. Pragmatics finally describe "the use of a sign system in concrete situations, especially in terms of cultural, ideological, economic and social activity."[259] Medieval treatises and chronicles about the reception of microtonal inflections can be regarded as contemporaneous testimonies of Pragmatic links. The Pragmatics of the sung liturgies, as notated in the sources analysed, define the contextual (biblical texts, genres) and circumstantial settings (liturgy and place) for the communication effectuated by microtonal inflections. For a semiotic approach, it is of essence that the three levels – Semantics, Syntactics, and Pragmatics – are taken into consideration.

A warning may be appropriate here. By employing semiotic theories and approaches to the sources consulted, one becomes very aware of the rhizomatic character of the material under study. Semiotics consist of structured snapshots of multi-levelled and frequently overlapping phenomena aiming to explain rules and constraints present in the material. In reality, the phenomenological categories connected to these structuring snapshots are often vaguely demarcated and as such fluent concepts, rather than the outer ends of the scales, which the snapshots might suggest.

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[258] Peirce 1931, 541. Capitalisation by me.

[259] Tagg 2013, 158. This is one of many definitions of Pragmatics. Eco complains about too many definitions: Eco 1976, 141, fn 2.

III.4. Qualities of Being Related to Microtonal Inflections

Peirce distinguishes between three fundamental categories of Being – Firstness, Secondness and Thirdness.[260] These three categories define a number of qualitative relations between the Object, the Sign-vehicle and the Interpretant in more detail. For Peirce, they are *phenomenological* categories, modes in which something may present itself to our perception. Firstness stands for a possibility, a Being without any related action; it does not refer to anything, nor is it related to anything. Secondness relates to forces, to "then and there", involving all of its relations to the universe. Thirdness is the mode of being "which consists in the fact that future facts of Secondness will take on a determinate general character".[261] To understand these levels of the workings of Sign-vehicles, it is important to perceive the three categories as gradually changing levels of meaning on a gliding scale rather than as strictly separated concepts.

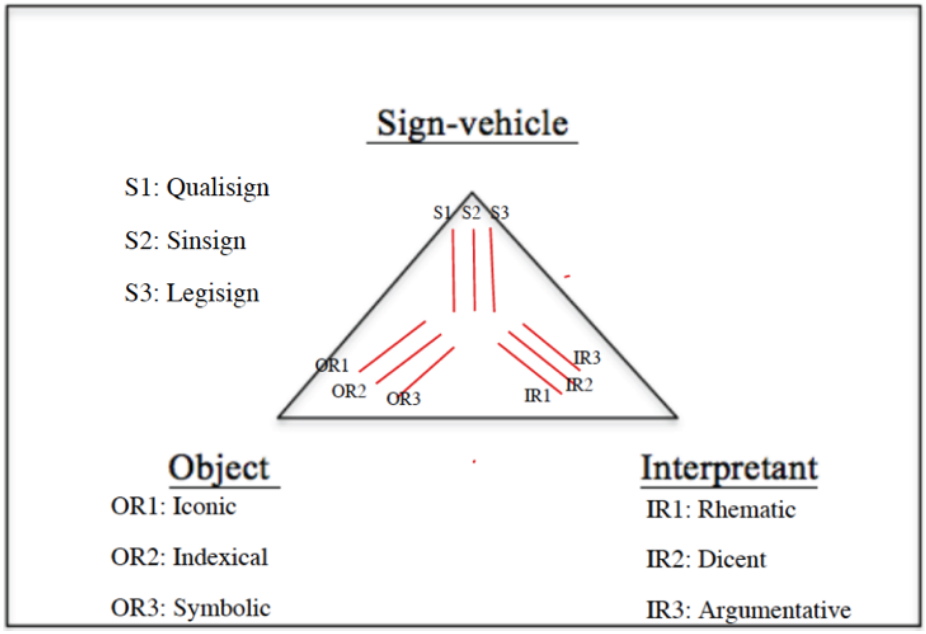

Fig. III.2. The qualities of the elements in Peirce's model.

In *fig.* III.2, the qualities of Firstness, Secondness, and Thirdness are specified for each relationship between the elements of the triad. By further analysing the content of the three

[260] Peirce 1931, I, 23ff.

[261] Ibid.

elements in the triads and their interconnectivity, we can gain more insight into the stages of Semiosis that apply for the communicative processes involving microtonal inflections. In the context of my analysis, below, I contextualise Peirce's terminologies with aspects of the performance tradition of Romano-Frankish chant and the recent musicological discourse around microtonal inflections.

III.4.1. Qualities of Sign-vehicles (S_{1-3})

For the Sign-vehicles, Peirce distinguishes three classes of meaning by quality, existential facts, or conventions / laws; he classifies these Sign-vehicles as Qualisigns, Sinsigns and Legisigns respectively (see *fig.* III.2). David Sagan gives a good example for grasping what a Qualisign represents.

> […] I use a color chip to identify the color of some paint I want to buy. The color chip is perhaps made of cardboard, rectangular, resting on a wooden table etc., etc. But it is only the color of the chip that is essential to it as a sign of the color of the paint.[262]

In other words, the Sign-vehicle blue is only a Sign-vehicle as a consequence of its otherness in respect to the other colour chips.[263] If all colour chips had the same blue colour, blue would not be a Sign-vehicle. But the chips' colours are, for instance, shades of red, yellow, and blue; only one colour (blue) matches the blue of my colour chip. That is where the meaning of the Qualisign stops: I observe a different, similar, or identical quality.

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[262] Savan 1988, 20. Here is one of the explanations Peirce gave: "A qualisign is an aspect, impression, or other primal significant regardless of its parts or of anything else simply because it involves the very character signified". Peirce 1905.

[263] It is important to stress that 'otherness' in this context does not imply antithetical but rather variant qualities. In Chapter IV, I will return to 'otherness' in more detail when identifying diatonic and non-diatonic accentuations as "significant otherness" as described by Donna Haraway (Haraway 2016).

> [I]n the first place, a sign [-vehicle, LL] may, in its own firstness, either be a mere idea or quality of feeling […]". "[…] [O]r it may be a 'sinsign', that is, an individual existent […], or it may (like a word) be a general type to which existents may conform.[264]

In the present context, the microtonal inflection as a neume or sound reflects the chip's colour in the example. As a Qualisign, it is an abstract quality without further connection. Froger recognises a qualitative aspect in the Dij special signs because they do not belong to the Sign-vehicles of the alphabet, but denies that it represents a microtonal inflection (he "hesitates about the colour"). Ferreira and De Loos recognise the microtonal inflection (as if it were the correct colour blue) but are inclined to interpret it as a Qualisign, or a Sign-vehicle without functional meanings.[265] In the observed traditions, the relationship between microtonal inflections and words by their interpreters were experienced as encoded sonic markers in their Secondness and Thirdness, as Sinsigns and as Legisigns. After the rediscovery of the phenomena 'special signs' and 'adapted neumes' during the nineteenth century, these additional meanings were not recognised and thus, no embodied Interpretants, i.e. Sinsigns and Legisigns, could be linked to them.

Sinsigns refer to connections between Sign-vehicles and particular *physical* existential facts; the standard examples for this kind of link are smoke as a Sign-vehicle for fire or certain temperature levels as a Sign-vehicle for fever. If connections between the Sign-vehicle and its Object are based upon law or convention, Peirce calls these Sign-vehicles Legisigns.[266] A microtonal inflection – in whatever quality: written, performed, or heard – by convention is a Legisign for a rhetorical meaning of the word to which it is linked. Similar accentuations, to be dealt with in Chapter IV (chromatic inflections, liquescens, formulaic variants, and tonal shifts), belong to the same category of Legisigns.

Legisigns may have many representations: on the one hand, for instance, they include the different notations of microtonal inflections in Dij, Clu, and Ult1; on the other hand, one may distinguish between a microtonal inflection as an image in a manuscript or as a sounding phenomenon when performed. When Legisigns – visible or acoustical – are represented in the same way with 'specific' qualities, Peirce calls them Replicas. In notation, for example, the neumes that represent microtonal inflections belong to the same

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[264] Peirce n.d. (3).

[265] "Meanings": "Cultural units organised in oppositions and structures." Eco 1976, 27.

[266] Peirce 2007, 291.

local / regional notation traditions are Replicas. Replicas have the same relation to their objects as Sinsigns: a certain temperature as Sinsign *always* indicates fever, the Replica as Sinsign *always* connects to rhetorical content. Sinsigns represent Secondness and a Legisign is Thirdness,[267] which Peirce elsewhere characterises as a mode of being with "a tendency to conform".[268]

The meaning of the microtonal *sound* as Replica had a wider diachronic and geographical impact than its notation, which in the course of time showed many variants. It is not unthinkable that the tradition could have had a considerable oral performance custom beyond its written form: *auctores* may have applied microtonal inflections *ad libitum* in addition to the microtones notated in their chant books, or may have sung them even without the backing of a regional written tradition.

III.4.2. Relations between Objects and Their Sign-vehicles (OR_{1-3})

Relations between Objects and the Sign-vehicles defined by them can be Symbolic, Iconic, and Indexical. We encountered this aspect of semiotics in Chapter I, when interpreting different categories of notations. The red light of a traffic light is Symbolic: the relation between the Object and its Sign-vehicle is conventional and culturally specific. As for the manuscript traditions observed, the Dij special signs are a perfect example of Symbols. An Iconic Sign-vehicle somehow physically resembles what it stands for, like the traffic sign announcing a dangerous curve to the right. The microtonal *clivis* on a staff contains by its written (Symbolic) contexts (lines, keys) certain Iconic traits: the notation shows that the interval is smaller than a semitone.

The *sound* produced by the *auctor* when performing the chant as notated is again Symbolic: the microtonal inflection links the Object, i.e. a word or expression in the chant, with the audience's rhetorical frame of reference. Irrespective of whether a Sign-vehicle is Symbolic or Iconic, it may be Indexical, meaning that it has a *fixated, constant* relation with its Object.

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[267] Defined by Peirce as "[T]he idea of that which is such as it is as being second to some first, regardless of anything else, and in particular regardless of any law, although it may conform to a law. That is to say, it is reaction as an element of the phenomenon." Peirce 1934, 66.

[268] Peirce 1931, 26.

Aimez-vous Brahms?*

Houdt u van Brahms?

¿Le gusta Brahms?

Lieben Sie Brahms?

Do you like Brahms?

The five phrases above not only have the same meaning in five languages, but they also have identical – or at least highly similar – melodic profiles. The question mark represents a prosodic accent that can be defined by a string of intervals that each person mastering the language understands. The audible consequences of the question mark even are understood without understanding the text. The question mark results in an indexical string of pitches linked to text meaning. The enharmonic parapitch has identical indexical properties, highly similar to those of exclamation marks: ¡Christ!, ¡because!, ¡the dragon!

* The novel with the same title has – deliberately – no question mark.
See: Françoise Sagan - Ina.fr, 1959. *INA - Jalons.*
(Equemauville, Calvados: ORTF, 1ère chaîne, 1959).

Smoke indicates fire; in the sample, the microtonal inflection always indicates rhetorically important elements in the verbal text. An Indexical Sign-vehicle points toward something and asks for action. The red light is Indexical as a traffic light, since it requires road users to stop. A red buoy floating in a river is Indexical as well, but indicates to shippers where to pass, which is an illustration of how in another frame of culturally agreed parameters, the *codes* of Sign-vehicles may differ. Turino refers to Erving Goffman's study of frames, which indicates that frames in turn may define sets of metacommunicative conventions, characterising (close-knit) communities.[269]

Codes create a Syntactic system by a structured set of Sign-vehicles. The code assigns units of an expression plane to units of a content plane,[270] by which they become structured in sets of cultural units. Codes reflect that different semiotic systems may apply identical Sign-vehicles for various meanings. In non-microtonal chant traditions, the *virga strata* indicates a slower performance of the pitches involved. In microtonal traditions, the *virga strata* is to be interpreted as a double microtonal *clivis*, indicating that the *auctor* had

[269] Goffman 1974. Turino 1992, 237.

[270] Eco 1976, 50.

the performance of a repeated microtonal inflection in mind. Codes may also establish *transitory* correlations between elements of semiosis that form a new sign.[271] By adding a sequential element to the definition of the coding rules – "establishing transitory correlations" – below, it becomes possible to formulate the *sequence* of effects / functions within the chain of microtonal-rhetorical Semiosis in *phases*. Taking snapshots, they reveal phases that start from the microtonal inflection's trajectory by crossing thresholds between several kinds and layers of meanings and texts from notation / sound by the *auctor* to its final linguistic station, *i.e.* the audience's interpretations. We only can agree with Eco, who states that the classical notion of the Sign (see Peirce) dissolves itself into a highly complex network of changing relationships.[272]

III.4.3. Relations between Sign-vehicles and Their Interpretants ($IR_{1\text{-}3}$)

Peirce also attributes three classes of qualities that determine the relationship between a Sign-vehicle and its Interpretant along the same lines as for Sign-vehicles and Objects: qualitative, existential and conventional. The Sign-vehicle is then respectively a Rheme representing an observed but unconnected meaning),[273] a Dicent,[274] or an Argument (he sometimes calls this a Delome).[275] The *concept* of the microtonal inflection, again, in the

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[271] *Ibid.*, 49.

[272] *Ibid.*, 49.

[273] Peirce 2007, 292. "A rheme is a sign which, for its interpretant, is a sign of qualitative possibility, that is, is understood as representing such and such a kind of possible object. Any rheme, perhaps, will afford some information; but it is not interpreted as doing so. […] Or we may say that a rheme is a sign which is understood to represent its object in its characters merely…"

[274] *Ibid.* "A dicent sign is a sign, which, for its interpretant, is a sign of actual existence. It cannot, therefore, be an icon, which affords no ground for an interpretation of it as referring to actual existence. A dicisign necessarily involves, as a part of it, a rheme, to describe the fact which it is interpreted as indicating. But this is a peculiar kind of rheme; and while it is essential to the dicisign, it by no means constitutes it. […] Or we may say […] that a dicisign is a sign which is understood to represent its object in respect to actual existence…"

[275] *Ibid.*, 204. "A representamen is either a rhema, a proposition, or an argument. An argument is a representamen which separately shows what interpretant it is intended to determine. A proposition is a representamen which is not an argument, but which separately indicates what object it is intended to represent. A rhema is a simple

traditions analysed here, belongs to the third category (an 'Argument'). Whereas the Object determines the Sign-vehicle, according to Pearce, the Sign-vehicle determines the Interpretant in the same constricting manner. If this relationship by its unique meaning has existential qualities, then the Sign-vehicle in its Secondness qualifies as a Dicent. The microtonal inflection *in the manuscripts analysed* is a Dicent (as opposed to the microtonal inflection as a concept).

Here it is useful to pick up an aspect of the transitory correlations as referred to in the previous section. In addition to the qualities described above, for both the Interpretant and the Object, Peirce distinguishes between an Immediate phase in their Firstness and a Dynamical phase in their Secondness.[276] The Immediate Object is the Object represented by the Sign-vehicle; in its Dynamical phase, the Object becomes effective in its Secondness. The same applies to the Interpretant, which in its Dynamical phase represents the effect "actually produced on the mind by the Sign (-vehicle, LL)".[277] Pierce calls the effect of experiencing the Immediate Object (in its Firstness, via the Sign-vehicle) the Emotional Interpretant, followed by the Energetic Interpretant in Secondness, referring to "effort". The Logical Interpretant in Thirdness refers to "habit-changes".[278] In light of the relations between the microtonal inflection and rhetoric, these phases of meaning are quite remarkable. The sounding microtonal inflection triggers the Emotional Interpretant, which in its liturgical and rhetorical contexts – if understood – subsequently connects it to the Energetic Interpretant in the actual meaning of Secondness. The Logical Interpretant may then refer to the intended morality contained in the text, leading to a better Christian attitude. These considerations will be important for describing the process in which the microtonal inflection contributes to establishing transitory meanings.

III.4.4. Ten Classes of Signs

By combining the (3 x 3 =) nine classifications (see *fig.* III.2), Peirce believed that he could construct a complete list of Sign types.[279] Whereas mathematically twenty-seven

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representation without such separate parts."

[276] Peirce n.d.(1).

[277] Peirce n.d.(2).

[278] Peirce n.d.(3).

[279] 'Sign' here defined as the combination of the three elements.

combinations are possible (3^3), Peirce observes two kinds of limitations by which the number of combinations shrinks to ten, which is basically a consequence of his assumption that Sn ≥ ORn and Sn ≥ IRn. The following explanatory text for this relation is from Michael Hoffmann.[280]

> The reason for that [lesser number of combinations, LL] results from the following points: […] if you consider the sign relation under the aspect of determination, this means that a sign will generally be determined, as we have seen, by an object, while itself determines its interpretant. This is to say that an interpretant will always be determined firstly by the kind of sign (Sign-vehicle, LL) itself (S) and, secondly, by the kind of the object relation (OR).
>
> Peirce assumes that a First can only determine a First, and that a Third can only be determined by a Third. This means that if the sign (Sign-vehicle, LL) itself (S) is a First, the object relation (OR) represented and the interpretant determined can only be a First as well. If the sign (Sign-vehicle, LL) (S), against that, is a Second or a Third, there is a corresponding increase in possibilities of categorically determined sign aspects (Sign-vehicle aspects, LL) with regard to the other relata.
>
> This results in a list of 10 possible types or classes of sign (Sign-vehicle, LL) relations, the first of which (SR1), for instance, to be read as that triad which has been formed, according to Figure 3-1 above, from S1, OR1, IR1:

Sign-relation	Name
SR1 (S1, OR1, IR1)	Rhematic Iconic Qualisign
SR2 (S2, OR1, IR1)	Rhematic Iconic Sinsign
SR3 (S2, OR2, IR1)	Rhematic Indexical Sinsign
SR4 (S2, OR2, IR2)	Dicent Indexical Sinsign
SR5 (S3, OR1, IR1)	Rhematic Iconic Legisign
SR6 (S3, OR2, IR1)	Rhematic Indexical Legisign
SR7 (S3, OR2, IR2)	Dicent Indexical Legisign
SR8 (S3, OR3, IR1)	Rhematic Symbolic Legisign
SR9 (S3, OR3, IR2)	Dicent Symbolic Legisign
SR10 (S3, OR3, IR3)	Argument Symbolic Legisign.

[280] Hoffmann n.d.

To this, Hoffmann adds two important, practical observations. First, the construction above is purely theoretical. Second, in practice, Signs are only perceptive in their Secondness as concrete and individual relations between Objects, their Sign-vehicles, and their respective Interpretants. They have 'identities'; in the present context, they are embodied by sounding and written Sign-vehicles. Because the microtonal inflections in their traditions as observed can be considered Replicas, their Legisign representation – accentuating Thirdness – can be substituted by Sinsigns. As for the analysis of the relations between microtonal inflections and words, this means that the explanation will focus upon the three Sinsign relations based on Secondness ('S2'): SR2, SR3 and SR4.

SR2 (S2, OR1, IR1) – Rhematic Iconic Sinsign

The 'double identity' of the Sign-vehicle's origin – written or sounding – makes a difference for the Semiosis in SR2. If the interpreter sees the microtonal inflection (S2) but does not link it to a quartertone for whatever reason (OR1), no chain of actions is triggered: "they look but do not see" (Matthew 13:13, in our days *e.g.* Jacques Froger). If in this constellation the written microtonal inflection is performed (S2) by the *auctor*, an action is initiated, but its physical quality is not perceived as a separate class of pitch by the audience (OR1) and thus has no effect (IR1). For the medieval *audience*, the more apt expression would be "they listen but do not hear".

SR3 (S2, OR2, IR1) – Rhematic Indexical Sinsign

A microtonal inflection is performed or notated (S2) and noticed (visually or aurally) (OR2) but without effect (IR1): there are cases where interpreters (contemporaneous or historians) are not aware of the convention that a microtonal inflection by definition implies a link between the microtone and a rhetorical underlining of the word concerned, e.g. the scholars who recognise the Sign-vehicle as representing a microtonal inflection in the musical assemblage, unaware of its conventional aspects regarding the verbal text. This most probably also applies to larger parts of the medieval audiences lacking the appropriate training, such as lay-brethren.

SR4 (S2, OR2, IR2) – Dicent Indexical Sinsign

A microtonal inflection is performed or notated (S2) and noticed (visually or aurally) (OR2) with the intended effect on the performer and the audience (IR2). In the medieval

performance and reception of liturgy, SR4 would reflect the 'ideal' Semiosis, in which the intention of the *auctor* leads to the audience understanding his message and behaving accordingly.

The three Sinsign-relations above are part of the overarching Peircean construct of the meanings connected to Being and describe the general insights provided by processes of Semiosis. Section III.5 goes one level deeper, explaining in detail how microtonal inflections create meaning within Semiosis.

III.5. The Microtonal-Rhetorical Model from a Semiotic Perspective

The findings of Chapter II can be represented by the following two semiotic triadic diagrams. The subject of the first triad (see *fig.* III.3) is the *auctor* linking the microtone to its Object by producing a sounding (or written) Sign-vehicle.[281]

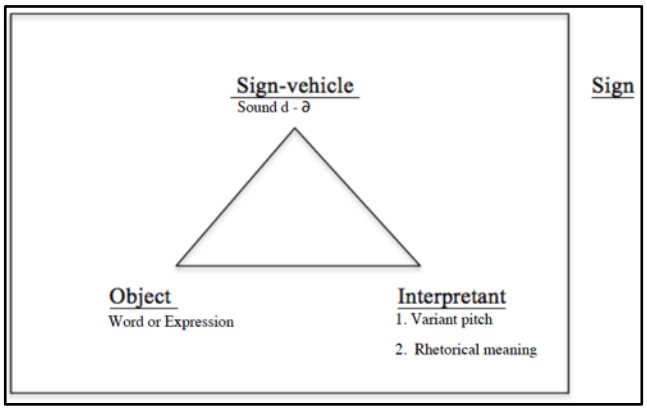

Fig. III.3. Peirce's Triad in the present context: the *auctor*

In the second phase of semiosis, as represented in *fig.* III.4., the subject of the action is the audience. The Interpretant is a range of possible rhetorical interpretations of the Object. If related to the rhetorical canon *interlocutio*/style, the Sign has a (Logical) semantic background; its interpretation should be: "Think!" For signification, the audience must combine the sounding non-diatonic pitch-sign and the word emphasised on the one hand with its knowledge of the liturgy and (biblical) texts on the other. After the microtonal

[281] It is important to distinguish between the Sign-vehicle as a subject of the Object and the subject effectuating the Sign, in this case human beings.

inflection as an encoded sonic marker has established the link, the linguistic Semiosis takes over the process of signification in subsequent triads.

If related to rhetorical *actio*, the microtonal inflection triggers action by a Syntactical (Energetic) interpretation: it emphasises the *position* of the word at the end of a verse in a responsorial chant, requiring the choir to take over from the soloist: "Sing!" (see *fig.* III.4). In the Syntactical context, shortly later, the audience is switching roles from passive to active interpreter.

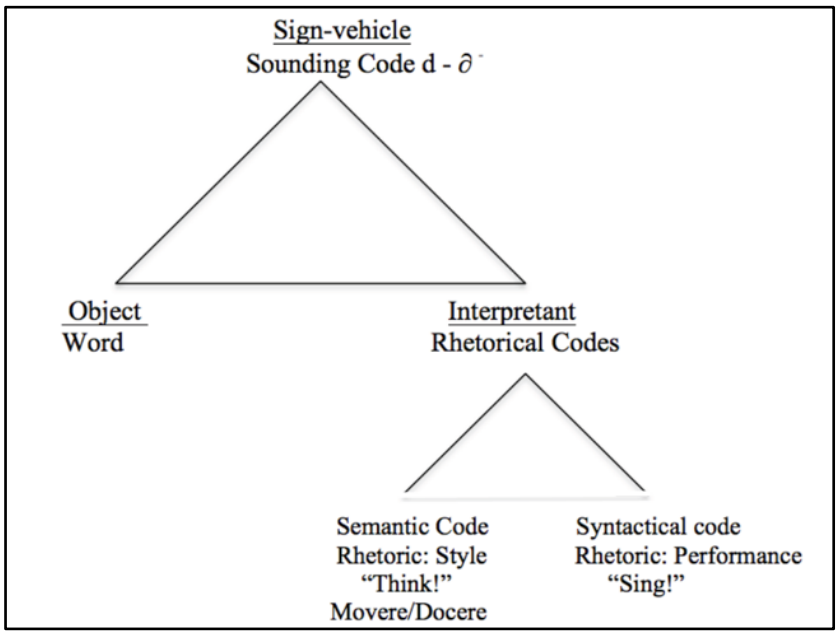

Fig. III.4. Pearce's triad in the present context: the audience

The diagrams above provide a structured but static snapshot-insight, but do not yet reveal the details of how and where the microtonal inflection contributes to creating meaning in the total process of Semiosis. Thus far, we only know that microtones represent merely a part of the total trajectory between Firstness and Thirdness.

III.5.1. Musemes

Theories of Signs explain the ways in which – within the context of Signs – Sign-vehicles convey meaning and on what levels. In combination with theories about codes, theories of Signs seek to map out the rules and constraints to bring deeper layers of meaning into the

surface structure,[282] which here translates as the rules and constraints in the process by which microtonal inflections express the rhetorical intentions of the *auctor*. The meanings of Signs heavily depend upon the texts in which they are applied. There are two complicating factors in the semiotic analysis of Romano-Frankish chant. First, we are dealing with two texts: the verbal text and the musical text. Second, the written and sounding aspects of the musical text have different semiotic constellations. As we saw in Chapter I, the written microtonal inflections can be Symbolic (the special signs in Dij) or predominantly Iconic (adapted neumes on a staff). When sounding, they are Symbolic, since their meanings rest purely on conventions, but in the meantime – for the connoisseurs of the style – they are Indexical (OR2 in *fig.* III.2.); microtonal inflections *always* reflect the *auctor's* rhetorical intention to accentuate the word in question.

By their otherness, microtonal inflections create musical distinctions, which effectuate additional attention to parts of the verbal text. In Romano-Frankish chant, the microtonal inflection – a defined interval between two pitches – belongs to the smallest possible categories of musical units expressing meaning. Parallel to linguistic morphemes, Charles Seeger suggests the word 'museme' for their musical counterparts.[283] In the syntagmatic axis of structural text analysis, strings consisting of several microtonal musemes in a phrase – except in melismas – are quite rare. The explanation lies in the rhetorical field, as explained in Chapter II: repetition of musemes leads to an overload of the tools' presumed workings.

I recall that according to Peirce's definition above, the Sign-vehicle stands for *aspects* of its Object; these aspects are reflected in elements of the Interpretant. The two Interpretants of the microtonal inflection in their musical contexts are sound qualities on the one hand and encoded meanings on the other. Concentrating on the sound qualities, in the monophonic context of Romano-Frankish chant, the meanings of the system start at the level of the museme. Auditory and visibly distinctive in the musical text, the microtonal museme is an introversive element that *per definition* reaches out to – one could say 'is also located *in*' – the verbal text; this is where the microtonal museme becomes an extroverted element for the presence of rhetorically important material in the verbal text.

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[282] Eco 1976, 303. For codes, I mainly refer to Eco's ideas.

[283] Tagg 2013, 232. Tagg refers to Seeger 1960, 229. Tagg elaborates on the pros and cons of Seeger's definition, but within the of Romano-Frankish context, the concept fits without problem.

Roman Jakobson defines introversive semiosis as a message that signifies itself; it dominates musical texts.[284] According to Jakobson, musical semiosis does not aim at extrinsic objects.[285] Contrary to visual arts and poetry, music has no or little referential elements with other texts, i.e. little extroversive semiosis. Microtonal inflections seem to deny this in Romano-Frankish chant; the same applies to other melodic accentuation tools in Gregorian chant, to be discussed in Chapter IV.

Sounded or notated by a variety of Sign-vehicles (both Iconic and Symbolic) in the cases analysed, the microtonal inflection establishes an Indexical link with extrinsic objects. This relation is denotative, representing a fixated code. Further specifications of the material are effectuated by liturgical and linguistic Interpretants beyond the musical text. The relation between the microtonal inflection and its liturgical and linguistic Interpretants is indirect and connotative. The only difference between a denotative relation and a connotative one is a different coding convention, "irrespective of the fact that connotations are frequently less stable than denotations,"[286] which is the first quality that comes to mind when defining relationships between microtonal inflections and rhetoric. The difference between denotations and connotations exists along with differences between content and expression, which characterise differences between Sign-vehicles and signal-vehicles.[287]

The microtonal inflection in the sung musical text at its Firstness level creates meaning physically, by interrupting the string of diatonic (tone-semitone) intervals with an enharmonic (microtonal) interval. The 'matter' of the sign-vehicle, here audible as a distinctive, non-diatonic interval, is what semioticians usually call the signal, which here again becomes a signal-*vehicle*. Eco positions the signal(-vehicle) "face to face with its lower threshold". Beyond that threshold, no semiotic meaning exists.[288] The microtonal inflection does not relate to the *contents*; it rather only expresses the *presence of contents*. At airports, there is a certain similarity with flight information conveyed over the public announcement system:

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[284] Jakobson 1971, 704f. Quoted in Agawu 2014, 23.

[285] "Un langage qui se signifie soi-même", Jakobson 1971, 704.

[286] Eco 1976, 56.

[287] Because this term is not applied by Peirce, it is not capitalised.

[288] Eco 1976, 21. For instance, the differences between the several calculations of the size of the intervals is/was perceived as microtonal inflections.

"May I have your attention"
"For a gate change"
"Flight x to London now leaves from gate n."

At first glance, one might have the impression that the microtonal inflection, as a signal-vehicle, only conveys the level of information under 1. "May I have your attention". However, there is one major difference with the airport example as interpreted above: the microtonal inflection includes the information of the second sentence, because a microtonal inflection *always* links to a rhetorical accentuation: in the airport example above, it could not relate to flight delays, for instance. This is the antecedent-consequent relation Eco considers necessary for interpreting the signal-vehicle *as Sign-vehicle*.[289] As a *recognised* antecedent, the signal-vehicle may be interpreted as a Sign-vehicle. The preliminary conclusion here is that 1. there is some kind of meaning 2. with a rhetorical background. But what is the trajectory from there to the Final Interpretant?

III.5.2. Sign-vehicles and Signal-vehicles

Seeking ways to describe the levels and phases of meaning transmission initiated by the microtonal inflection in its role as signal-vehicle, I went back to Peirce's Firstness, Secondness, and Thirdness. The differences between them may also reflect grades of intensity,[290] which appeared to be a good starting point for clarifying the character of the correlation between the microtonal inflection as signal and the verbal text. The meaning transfer by a signal-vehicle starts at a level that matches Firstness applied to the Interpretant, which Peirce defines as an Immediate Interpretant (IR1). It merely conveys identification and recognition; it is not fit to produce any actual reaction.[291] The signal-vehicle, the microtonal inflection as a non-diatonic museme (by its otherness in a diatonic musical text), merely points to the rhetorical otherness of a word in a chant without defining it. By pitch, it offers unreflexive access to a word as an Immediate Object (OR1). Susan Petrilli introduces the concept of 'signality' as the lowest degree of semiosic

[289] Eco 1976, 48.
[290] Peirce 1931, I, 23ff.
[291] Peirce 1958, Vol. 8, 315.

activity,[292] reflected in Peirce's Firstness. At the signal level, the interpretation of the signal-vehicle "merely takes place in terms of identification or recognition",[293] which is a citation by Peirce and can be linked to an Emotional Interpretant. It is the Indexical antecedent-consequent relation that has aspects of Secondness: if a microtonal inflection appears in the melody, there *has* to be an intention to rhetorically accentuate the verbal text.[294]

By then substituting Eero Tarasti's three subsequent stages of *signs* (pre-signs, act-signs, and post-signs) with phases of *signals*, we come to the essence of how the microtonal inflection contributes to the creation of meaning.[295] Tarasti defines pre-signs as "stimuli or gestures used to produce secondary signs, which are responses to those initial gestures".[296] They may be immanent or manifest. The signs they evoke are act-signs. An act-sign has unfolding qualities; it becomes existential "when it suddenly becomes a concept. […] All what we hear as a present act-sign, is basically a metaphor of some (horizontally or vertically) pre-existing […] entity."[297] Post-signs are equivalent to Interpretants, and, as pre-signs, may be immanent or manifest. The difference between Tarasti's pre-act-post-*sign* (vehicles) and my pre-act-post-*signal*-vehicles lies in their objects: sign-vehicles refer to content, signal-vehicles refer to expression, in other words to *references* to content.

The microtonal inflection effectuates the transmission of meaning. In its first phase, consisting of verbal and musical Firstnesses, the microtonal inflection as a pre-signal-vehicle – itself de-familiarised by its non-diatonic quality – appears on stage in unison with an element of the verbal text, foregrounding the latter as well. In the musical text, the microtonal inflection is made apparent by its physical, sonic otherness, the quartertone. It connects to the Emotional Interpretant, which reflects sense and feeling at a level of Firstness. It does refer to content, however, and as such can be characterised as a Sign-vehicle in this phase.

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[292] Petrilli refers to 'semiosic' in the sense of a phenomenon related to semiosis. Petrilli 2009, 597.

[293] Petrilli 2014, 33.

[294] Peirce and Welby 1977, 110.

[295] Tarasti 2001, 33.

[296] Tarasti 1997, 22.

[297] Tarasti 2012, 60.

In the second phase, as a stimulus ('Enunciant') at the signality level, it points towards its response in the subsequent act-signal, which is the result of the 'vertical', the paradigmatic fusion between the microtonal inflection and the verbal text it accentuates. Via the act-signal, the denotative relation between microtonal inflection and verbal text on the one hand refers back to the immanent presence of multiple layers of meaning in the verbal text while, on the other hand, opens toward the Dynamical Interpretant. In this phase, the microtonal *signal* points only towards form: it refers to multiple, non-defined meanings in the verbal text and announces the presence of structuring rhetorical meanings, again, without yet referring to specific linguistic *content*. This is the decisive phase where the introvert-extrovert switch takes place.

In the examples (APPENDICES V – VIII), after the act-signal-vehicle, Logical Interpretants on Sign-vehicle levels take over, referring to the subsequent chain of relations between linguistic contents. When Secondness comes into play for the Interpretant, Dynamical Interpretants take over: the choices motivated by biblical texts in the applicable liturgical context link to affect, logic, and *loci* (including the connotative knowledge of the word as *langage figuré*) that lead towards the Final Interpretant. In Ult2 Office chants, the microtonal inflection may as well be an act-signal-vehicle opening towards an Energetic process in the Dynamical Interpretant, the soloist announcing a cue, which can be understood as his request to the choir to take over. Both the Energetic and the Logical chain lead towards the Final Interpretant: "the one interpretative result to which every interpreter is destined to come if the sign is sufficiently considered".[298] The semiotic process described can then be summarised in four steps:

1. A semantic or a syntactical connotation in the verbal text of a chant ignites the Semiosis. At the introvert level of an Immediate Interpretant, the microtonal inflection is a denotative musical pre-signal-vehicle, which, as an expression, starts as an enharmonic interruption of the physical diatonic (main frame) pitch system of Romano-Frankish chant.[299]
2. The combination of word and pitch as an act-*signal*-vehicle introduces an introvert-extrovert switch, opening the trajectory of meaning from expression towards content.

[298] Peirce and Welby 1977, 110.

[299] Cf. Fellerer's 'disconnected Schallform' above.

3. Signal-vehicles become Sign-vehicles by Dynamical Interpretants, the contents of (Logical) linguistic act-*sign*-vehicles (expressing content) lead towards the Final Interpretant intended by the *auctor* reflecting affect, logic, and / or *loci*.
4. The (targeted) post-sign-vehicle coincides with the Final Interpretant of the Logical act-sign-vehicle; it is the immanent response by the audience: meditation on the text message, the predominant form of targeted Final Interpretants. In case of an Energetic act-sign, the response to the post-sign as Final Interpretant will be manifested by the *actio* of the singers.

While from a post-modern point of view the existence of a Final Interpretant may be debatable, it certainly applies for the intended result of medieval liturgical text communication.

III.6. Pragmatic Considerations

In order to understand the *auctor's* code, a communicative social-cultural model must be in place. In Peirce's terminology, this model can be defined as Pragmatic, in which the audience must

- be able to distinguish the microtonal inflection from the diatonic framework
- be aware that the microtonal inflection is a signal-vehicle for the verbal text
- have a passive knowledge of biblical texts and
- have a passive knowledge of rhetoric.

For the audience, the formal melodic rules for positioning microtonal inflections are not essential for understanding their possible meanings. The *auctor*, in order to communicate his (or the manuscript's) message efficiently, should have an active knowledge of biblical exegesis and rhetoric. Positioning the microtones according to the musical syntax will earn his connoisseurs' appreciation for his craftsmanship. Philip Tagg visualises the musical communication in pragmatic contexts that also apply to microtonal inflections (*fig.* III.5).[300]

[300] Tagg 2013, 174.

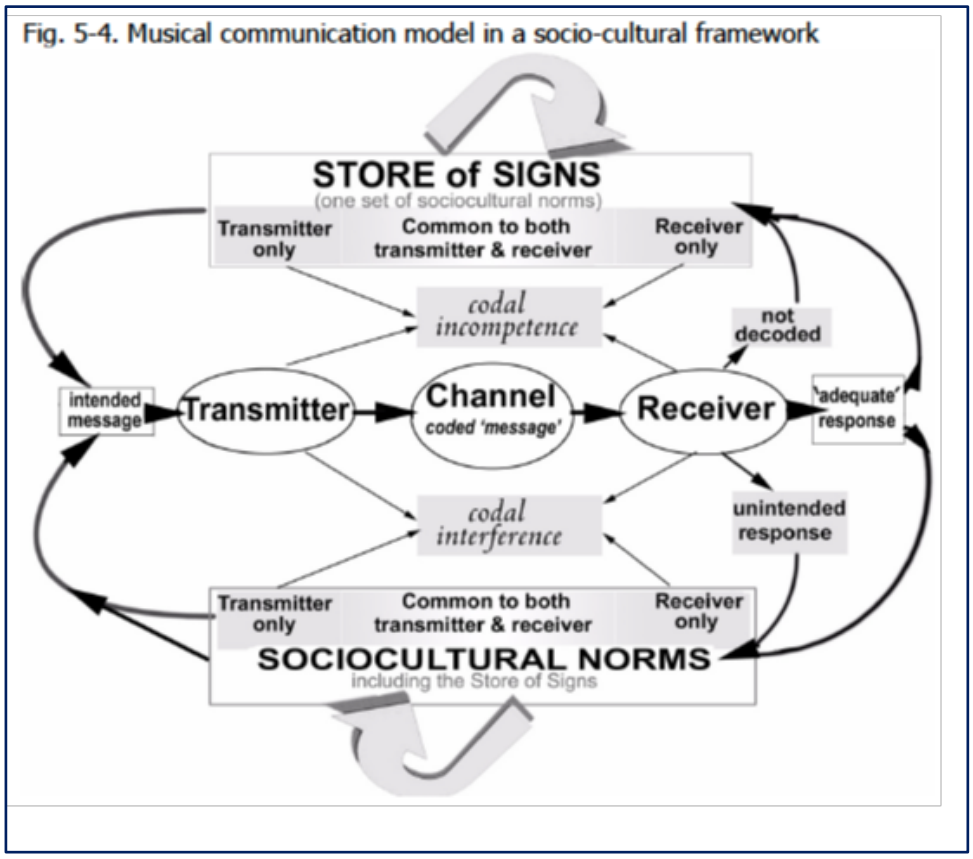

Fig. III.5. Philip Tagg: Figure 5-4, 2013, 174.

Is it realistic to assume that the audience had sufficient practical knowledge to *immediately* filter the correct meaning as intended by the *auctor*, who transmitted it by that one coded signal? The number of possible biblical references is vast; in addition, except perhaps in responsorial chants, the ritual has no pauses for contemplation at the moment in which the *auctor* stresses the word. The microtonal inflection has no other function or meaning apart from pointing to the word concerned; the audience needs a linguistic context for 'instant' interpretation. For non-professional prayers, decoding the implications of the sonic marker must have been very complicated if not impossible.

However, as far as the audience consisted of professional prayers, they would have known the biblical texts by heart; they started their training by memorizing the psalm texts when they were eight to twelve years old—when singing in the choir, all 150 psalms were sung weekly. In addition, most texts analysed in the sample are closely related to or identical with psalm texts. Singers knew the specific diatonic melodies linked to the

liturgical setting of Mass and to the genre in question (introit, gradual, offertory, alleluia, tractus, and communion); their rhetorical training guided their memories by checking for matches in affects, logic, and exegetical *loci*. My conclusion is that a combination of intensive training and categorised grids enabled the interpreters – if they were aware of the musemes as codes – to instantaneously decode the connotative signal from a level of Immediate Interpretant to its Final Interpretant.

After the Carolingian reform, chant texts in North-western Europe had become as good as identical; on local and regional levels, the corpora of diatonic melodies for these texts were often very similar if not identical. In my analysis of some regional traditions in these fixated settings, there is only one interpretative element: non-diatonic pitches, as sonic markers, used as signal-vehicles to highlight textual elements. The five traditions analysed have the same rules and codes for applying these signal-vehicles by pitch; only Dij offers the *auctor* a little more liberty in how to insert the microtonal inflection in the string of fixated diatonic pitches.

The elite medieval *auctores* and audiences in the socio-cultural context of the liturgy for Mass in North-western Europe knew how to encode and decode this signal: their memories checked for matching concepts and connotations of affect, logic, and *loci* on a rhetorical grid structured by *circumstantiae*. The signal-vehicle, released from the musical text by a sounding non-diatonic pitch, has a verbal text element as Object, which in turn is part of a rhetorical and liturgical system, containing the Interpretants for the Signal-vehicle. Both sender and receiver could rely on these frameworks for the intended message. The traditions only differ in terms of to *which* words in the concerned chants these codes apply. The acceptance of a *personal* interpretation of text by pitch codes seems to be a feature of an institutionalised medieval tradition thus far unknown.

III.7. The Microtonal Inflection as a Semiotic Parapitch

On the one hand, the microtonal inflection as a nonverbal signal-vehicle, orally or notated, contributes to conveying meaning about a text element. On the other hand, it is undeniably a sonic phenomenon in music that I interpreted above as enharmonic interruption of the diatonic framework of Romano-Frankish chant. But, as De Loos pointed out correctly, a microtonal inflection cannot be classified as part of a scale as it never (with some relatively sporadic exceptions in Dij) appears as an independent pitch, but is always connected to a

supersemitonal pitch (*do*, *fa,* or b^b) above it. So, how does one define this microtonal-rhetorical phenomenon bridging the verbal and the musical text in *one* expression?

Barthes defines one of the levels of intertext (mentioned above) as the paratext as described by Gérard Genette. Genette addresses paratextuality from the perspective of textual transcendence, describing the latter as "everything that brings the text into relation (manifest or hidden) with other texts".[301] The construct of textual transcendence (whence the title *The Architext*) consists of three interlinked modules: transtextuality (the literal presence of one text within another, e.g. a quote), metatextuality (the relationship that links a commentary to the text it comments on, e.g. a comment, a review) and paratextuality, an additional category that Genette here loosely describes as "other relationships of imitation and transformation".[302]

In his *Seuils* (translated *Paratexts. Thresholds of Interpretation*),[303] he attaches a number of characteristics to the paratextual message, which is always subordinate to the text to which it is linked, as "the [message that] describes the spatial, temporal, substantial, pragmatic and functional characteristics [of a text]".[304] Genette's concept of paratext in reviews and summaries has mostly been truncated to things such as the colophon, the title, the name of the author, the translator, etc. A close reading of *Paratexts* reveals that the concept has a wider scope: "For those who like formulae, paratext = peritext + epitext."[305] 'Peritext' refers to positions in the text (footnotes, chapters) and is related to the message of the text itself. 'Epitext' is a category at a distance, containing all the messages outside the book, such as comments and interviews. Epitext relates to the cultural context of a text, the *pragmatics* of a text. The pragmatic status of a paratextual element is defined by what Genette calls its *illocutionary force*, "the characteristics of its communicatory instance or situation", which relates to the weight of the message by the authority of its sender ("not necessarily the person who wrote the paratext") and the content of the message. The content, indicated by Genette as 'illocutionary', may reflect information, intention, *or a warning*. Needless to say, for Christians, liturgical texts have the highest possible illocutionary force.

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[301] Genette 1992, 81.
[302] *Ibid.*, 82.
[303] Genette 2001.
[304] *Ibid.*, 263.
[305] *Ibid.*, 265.

These communicative aspects are the essence of the paratext. "The paratext in all its forms is a fundamentally heteronomous and auxiliary discourse devoted to the service of something else, which constitutes its right of existence, namely, the text."[306] The characteristics of the paratext, including their functional aspects "may not be described theoretically, and in a way, a priori, in terms of status. [It is] determined by a more or less free choice, applied to a general and constant grid of personal alternatives […]". The latter quality is also one of the essential pragmatic characteristics for the employment of microtonal inflections: in the sample, against the same musical and verbal background, *auctores* applied the rules to different words. Elucidating on the switching of this linguist narrative into a musical setting is a further elaboration by Genette about the prefix *para* in a footnote, where he quotes J. Hillis Miller:

> Para is an antithetical prefix which indicates at once proximity and distance, similarity and difference, interiority and exteriority… a thing which is situated at once on this side and of that of a frontier, of a threshold or of a margin, of equal status and yet secondary, subsidiary, subordinate, like a guest to his host, a slave to his master.[307]

The transmutation of 'paratext' from a purely verbal environment to 'parapitch' seems the most apt characterisation of a Romano-Frankish chant phenomenon from a semiotic point of view.

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Microtonal inflections cannot be interpreted in terms of *imitatio*. However, Joppich's considerations of the distinction between *vertonen* and *betonen* were helpful and his concept of *Klangwerdung* connects very well with the Deleuzian idea of 'becoming'. During the last decade, cultural historians and musicologists have been paying more attention to parallels between grammatical, rhetorical, and musical models that by their *ductus* inspired medieval *auctores* and audiences. From Carolingian times on, Reckow observes the increasing importance of a concept that reflects grammatically correct formulas in music, at the cost of rhetorically convincing performances. At this point in my analysis, my findings seem to contradict this tendency, but in the next chapter, Reckow's

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[306] Genette 2001, 269.

[307] *Ibid.*, 271, fn 2 refers to Hillis Miller 1979, 19.

observations will again receive more credit, if the additional diachronic analysis of accentuation tools applied in second-mode tractus represent all genres.

The grammatical models and common musicological terminologies appeared to be insufficient for analysing the workings of the microtonal inflections in more detail. By employing semiotics, it was possible to articulate the intermediate position of the microtonal inflection in between the verbal and melodic texts that constitute chant. The analysis resulted in a four-step semiotic process in which the distinction between signal-vehicle and sign-vehicle demarcate subsequent phases. By this distinction, the melodic and verbal spheres of influence of music and meaning could be defined. Acknowledging its intermediate position, parallel to linguistic considerations about the paratext, the microtonal inflection is suggested to be defined as a parapitch. The concepts defined in this chapter facilitated the analyses of microtonal inflections and other tools of accentuation that will be presented in Chapter IV.

CHAPTER IV

THE MUSICAL GRAMMAR OF MUSEMES: RULES AND TRANSMISSION

A gridded space applies to many aspects of the discourse about Gregorian chant, here meant as the overarching concept for Romano-Frankish chant and its assumed Roman predecessor:

> Movement in [this gridded] place is confined as by gravity to a horizontal plane, and limited by the order of that plane to preset paths between fixed and identifiable points. Nomad space is "smooth", or open-ended. One can rise up at any point and move to any other. Its mode of distribution is the *nomos*: arraying oneself in an open space (hold the street), as opposed to the *logos* of entrenching oneself in a closed space (hold the fort).[308]

Gilles Deleuze's concepts as explained in the introduction to *A Thousand Plateaus* are ideal for exploring phenomena, which by their unknown settings in a barely defined environment are difficult to understand. They are in *nomos* space. Once the settings and the environment of the phenomena in question have reached a certain degree of familiarity, in practice, the researcher tends to create *logos* again. This is not meant to entrench herself or himself, as suggested above, but rather to provide a communication grid for the field to which the findings are to be linked. Analysing non-diatonic pitches indeed meant leaving the comfort-zone of the musicological *logos*, because their occurrence in chant is not an acknowledged observation. In this chapter, what was found in *nomos* will again be contextualised and integrated into existing musicological theories.

The preliminary conclusions about non-diatonic melodic traditions presented in Chapters I and II do not fit with the usual scholarly approaches to research aimed at the diatonic restitution of Romano-Frankish chant. The rediscovered characteristics of the parapitch create structure by their non-diatonism. When performed, the parapitch melodically accentuates a word and by its inherent indexical qualities annotates the text, a process through which rhetoric is a catalyst that channels connotative interpretations. The only non-diatonic elements of interest in current restitutionary analysis are semitones in

[308] Deleuze and Guattari 1987, xiii. Translator's foreword by Brian Masumi.

‘wrong’ positions, often unstable, and inconsistent with modal considerations. By systematically substituting these ‘errors’ with pitches that comply with the most probable modal – diatonic – frame, the *restitutores* seek to eliminate contaminations from the supposed diatonic origins of chant. In current research, apart from the restitution of the earliest melodies, microtonal inflections are at best noticed and transcribed with a special symbol but without consequences for the subsequent analysis.

It should be understood that this is not a methodological reproach of restitutionary practices as such: far from it! As long as no accepted theory exists for the possible functions of non-diatonic pitches and their geographical and diachronic scopes, parapitches are irrelevant in the gridded *logos* of diatonic analysis. If my hypotheses stand up to argument however, they could reconnect aspects of diatonic and non-diatonic traditions, hopefully contributing to an extended discourse about Romano-Frankish chant’s developments over time. In this chapter, the first contours for such a theory will be sketched.

If art historians agree upon restoring the oldest layer of a fresco, it necessarily means removing and destroying all layers but the oldest one. However, musicological restoration is, contrary to the restoration of frescos, non-destructive: it allows for reconstruction without destroying other artistic expressions. Nothing inhibits attempts to reconstruct a highly sophisticated monophonic soundscape that has become covered by thick layers of diatonic lime, including representations of older soundscapes. The convincing and systematic findings here seem to justify such attempts. If, after additional analysis, my findings would gain wider support, it is upon the scholars studying possible restitutions of early sung liturgies to decide whether the results fit into the overall image of the layer at which they aim their restitutions.

The first issue to be investigated in this chapter is whether the exploration based upon a sample for all genres of Mass can be confirmed by an analysis covering *all* microtonal inflections in the core chants of *one* genre, the tractus of the second mode. In the past, too much research in the fields where music and meaning meet was based upon selectively wrapping theories in examples that matched the view presented while neglecting contradictory cases. Admittedly, the core repertory of the second mode tractus could be considered to be selective. On the other hand, given the limitations of a one-man operation in the context of a doctoral dissertation, the genre with one of the highest densities of microtonal inflections resulting in more than 200 cases seems to be a defendable choice.

The analysis of the second-mode tractus in this PhD dissertation is embedded in previous research by Emma Hornby in which she devotes a great deal of attention to the rhetorical employment of "emphatic phrases" in the second-mode tractus (paragraph IV.1.).[309] A confirmative conclusion about the functionalities of the parapitch in this genre leads to the second question: could *auctores* apply microtonal inflections in these tractus "when they felt like it", to again quote Jacques Froger?[310] Could they apply parapitches exclusively inspired by the text and guided by rhetorical *ductus*, or did certain traceable musical constraints exist? For the second-mode tractus as notated in the six manuscripts consulted, the conclusions suggest that *melodic* constraints, in addition to certain *rhetorical* constraints, apply. The diatonic 'standard melody' for a word in a given position in the text defines whether the *auctor* can apply a parapitch or not (paragraph IV.2.).

Emphatic phrases and microtonal inflections are both tools for text annotations by melodic means. Their occurrence in the same repertory offered the opportunity to put different aspects of melodic text annotation into a wider perspective. It appeared interesting to comment on how, in combination, these tools relate functionally. The overlaps of empathic phrases and microtonal inflections as well as their almost complete disappearance in the younger Frankish repertory solicit additional diachronic explanations, as will be shown in this chapter. It has to be called into question whether what looks like a superimposed employment of both annotation techniques – I will refer to "stacked musemes" – was indeed intended as such (paragraph IV.3.).

In Chapter II, it has been demonstrated that microtonal inflections and non-diatonic semitones in Ult2 appear to have the same rhetorical functionality. In paragraph IV.4, the theoretical background for non-diatonic semitones will be explored. Given the variety of genres in which these semitones are employed, further analysis of the possible melodic constraints that may define the employment of non-diatonic pitches (cf. paragraph IV.2.) was not possible at this stage.

The stacked musemes and the outcome of diachronic analysis drew the analysis into transmission theories, a subject I initially wanted to avoid; enough had been turned up already, or so it seemed. However, the stacked musemes sparked the subsequent considerations in this chapter, leading to a tentative hypothesis about the possible processes that influenced adaptations between older and younger versions of Gregorian

[309] Hornby 2009.

[310] Froger 1978, 178.

chant (paragraph IV.5.). It is intended to provide a conceptual platform for the position of both diatonic and non-diatonic musemes as text annotation tools in current theories about transmission. In order to provide a wide-enough platform, liquescent notes and modal shifts were additionally taken into consideration. Like other parts of this pilot study, it cannot provide more than a waypoint at the start of a new path to be discovered. Where it ends or connects to other paths, at this juncture, can only be speculated.

The hypothetical backbone for all of these tools was likely an older tradition, of which the *core* system was strongly rooted in a diatonic, formulaic repertory. In that particular context, by formulaicism, the system of constraints of a melodic phrase, musemes (some of them adding non-diatonic material) could annotate text meanings, whereas rhetoric channelled connotative processes needed to establish the connection between the parapitch and expressions of *langage propre* and *langage figuré*. The possible consequences of these observations for transmission theories will be presented in paragraph IV.6.

IV.1. Microtonal Inflections in the Second Mode Tractus

Emma Hornby presented four pre-Carolingian core-repertory tractus, to which five 'Carolingian' tractus were added, composed between 830 and 900.[311] These tractus were only sung during Lent. The origins of the older tractus may lie in the Roman Lenten cycles, which came into existence around the fourth century.[312] Both the texts and their phrasing reflect a psalmic origin. From the ninth century on, Frankish compositions were added to the repertory, growing substantially during later ages.[313] Tractus are lengthy solo chants without repetitions or responsorial elements but with a complex interplay of formulaic material.[314] For a correct performance, the singer needs to have an active knowledge of the applicable formal and textual considerations that underlie the employment of formulaic

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[311] Hornby 2009, 2.

[312] Cf. McKinnon 2000, 357. Also: Hornby 2009, 112. Andreas Pfisterer assumes a fifth-century Roman origin of the repertoire, gradually evolving towards the texts and melodies as observed in the earliest [or earlier?] notated sources. Pfisterer 2001.

[313] Karp 1998, 100.

[314] Hornby discusses the arguments that point to earlier responsorial traditions in this genre.

phrases.[315] Their performance has been an acknowledged challenge for singers since the ninth century: bishop Angilram of Metz paid the performer of one tractus sung on the first Sunday of Lent 12 denarii, whereas singers normally received only 2 denarii for a day's service.[316] The extra payment was perhaps a remuneration for the extraordinary length of this solo chant. On the other hand, the higher remuneration might as well reflect the complexity of the state-of-the-art performing of a tractus with its emphatic phrases, perhaps including microtonal inflections. At that time, Metz was considered to be the liturgical Rome north of the Alps.

The tractus verses analysed in essence all have the same basic formal characteristics, although musicologists applied different subdivisions partly due to the various perspectives of their analyses.[317] The diagram below is based on that of Hans Schmidt, to which the subdivision by numbered phrases as applied by Hornby was added underneath (*fig.* IV.1.).[318] The basic structure of a second-mode tractus consists of two half-verses divided into two phrases each, the second phrases ending with a melisma. The subsequent finals of the phrases are D, C, F, and D again.[319] The median and the final phrases up to their melismatic cadences are variable. The melismas as well as the first part of the second half verse have fixated forms. Schmidt's diagram underlines the subdivisions' grades of melodic stability because his aim is to identify the formulaic character of the tractus structure as such.[320] The darker the colour, the higher the degree of stability. The first verse stands out by a higher stability of the opening (in the subsequent

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[315] In her Appendix 4, Hornby distinguishes some thirty formulaic phrases in the Romano-
Frankish and Old Roman traditions for this genre. Hornby 2009, 241ff.

[316] The two longest tractus have thirteen verses. The performance of one of them, Deus deus
meus, may take more than 12 minutes. *Ibid.,* 2, fn 4.

[317] Ibid., 6.

[318] Schmidt 1958, 9. This publication is a summary of his doctoral thesis: 'Untersuchungen zu den Tractus des zweiten Tones aus dem Codex St. Gallen 359'. Bonn (1954).

[328] Schmidt distinguishes between an initial phrase and a flex phrase, a distinction other musicologists consider as irrelevant.

[320] Schmidt refers to formulas (Formeln). The term 'formulaic' became current during the 1960s and in musicology was promoted in several publications by Hucke (Hucke 1980) and Treitler (Treitler 2003).

verses called initial phrase). The phrases after the median phrase have the highest stability according to Schmidt's analysis, culminating in the last verse.

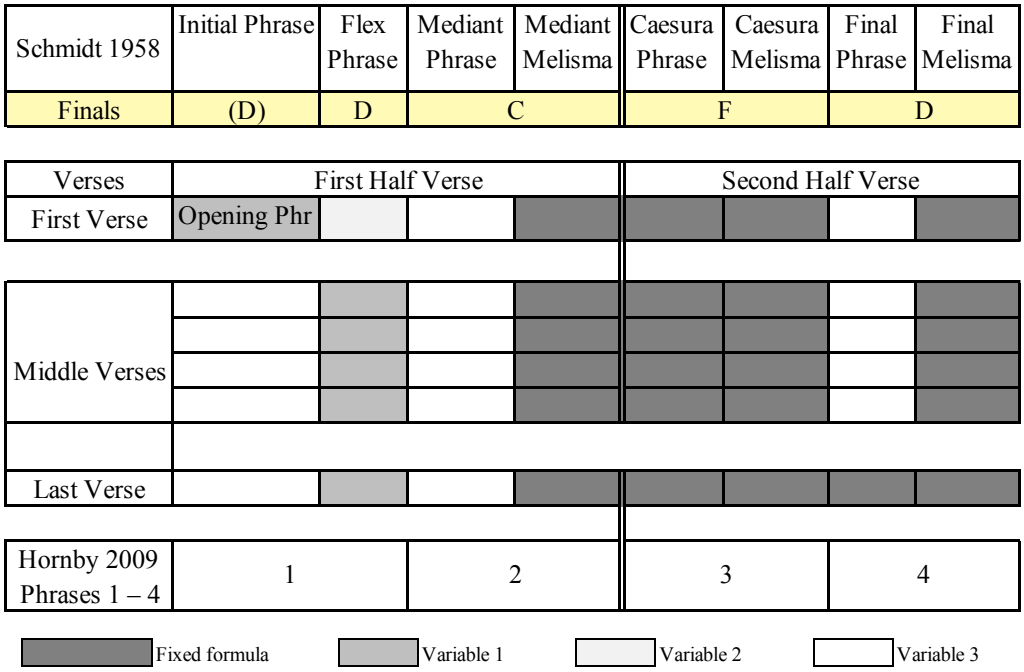

Fig. IV.1. The basic structure of second-mode tractus.

Schmidt observes for Codex Sankt Gallen 359 (with references to the other manuscripts analysed in Dom René-Jean Hesbert's *Antiphonale Missarum Sextuplext*[321]) that a limited number of formulas defines the genre. There seem to be patterns for the employment of formulas, which are related to their position in the verse and the number of syllables in a phrase. But many variants (*Unregelmäßigkeiten*) remain for him enigmatic (*Geheimnisumwoben*). Trying to explain these variants, according to Schmidt,

> […] stößt man auf ein Gerüst, welches unmittelbar und unverkennbar den Ursprung in der gehobenen Rede offenbart. [...] Was an diesen Gesängen gebunden ist, das ist bestimmt textgebunden, wenn auch nicht unter unmittelbarer Bezugnahme auf einen einzigen Text.[322]

[321] Hesbert 1935.

[322] Schmidt 1954, 105.

> [[…] one detects a framework, which directly and without any doubt points towards a rhetorical origin.[323] These chants for sure are connected to text, be it an indirect connection to more than one text [level, LL].]

Yet at the threshold of further discoveries, Schmidt's analysis comes to a halt. Hornby's approach is different: starting from the formula patterns as identified by Schmidt and others,[324] she analyses the underlying principles for employing formulaic variants in the genre that go beyond Schmidt's interpretations:

> Each second-mode tract consists of an apparently unpredictable mixture of formulaic material with unique ('ideomelic') phrases and extended rhapsodic melismas. It is the interplay between these elements, rather than the memorability of the formulaic passages, which is my main concern here.[325]

The first stage of her analysis is a further refinement of previous observations comparable to Schmidt's, commencing with a textual and melodic phrasing of tractus verses along the system of *cola and commata*, the text divisions as found in the earliest psalters. Previous research induced Hornby to search for the earliest known Psalters in north-western Europe in order to trace the concepts underlying the medieval interpretations of text divisions and their presumed Roman origins. Insular Roman Psalters from the eighth century are the oldest sources still available.[326]

With some occasional differences, the text divisions of tractus follow the Psalter divisions in the twenty-four manuscripts Hornby analysed for her book; the text divisions of the *Qui habitat* verses are even completely identical to the Insular Roman Psalters. The psalmic half-verse divisions coincide with the internal textual structure of the tractus, which stabilises the melodic frame. *Cola* refer to phrases with cadential structures, *commata* reflect the phrases with weak cadences or no cadence at all. Smaller fractions of the phrase (almost always integrated with its larger units) are the *syllabae* or neumes, in

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[323] Schmidt's *gehobene Rede* literally means the 'grand style', which I interpret as a pars pro toto for 'rhetoric'.

[324] She refers to Hans Schmidt, Olivier Cullin, Willi Apel, Helmut Hucke, Theodor Karp, David Hiley, and James McKinnon; Hornby 2009, 6, fn 25, 26.

[325] Ibid., 3.

[326] The oldest known Italian Psalters were written during the eleventh century. *Ibid.*, 24.

medieval terminology referring to 'identifiable gestures'.[327] Hornby does not take the *syllabae* level into consideration, with two exceptions labelled V and W,[328] which according to Hornby have text-enunciating characteristics. This approach results in a structure consisting of four main phrases; depending upon the presence of clearly distinctive sub-phrases defined by *commata* and *syllabae*, the total number of phrases per verse in Hornby's analysis repeatedly increases to six, sometimes even to eight (e.g. *Qui habitat* verse 6).

Apart from the coincidence of phrase divisions and syntactical divisions, Hornby distinguishes six variant text division principles for the formulaic settings of phrases.[329] Divisions against the syntax (1) are triggered by textual cues, resulting in necessary adaptions of the phrase material. The division against the sense to promote a reading (2) has similar characteristics. If text and melody are impossible to reconcile, this results in a formulaic setting that again reflects a division against the syntax (3). Divisions against the sense occur when text fragments are too short to fill the quadripartite standard phrases, requiring adapted melodic material (4). Some tripartite verses (5) and apparent variant scribal interpretations (6) cause phrase adaptations as well.

The adapted phrases were systematically employed and although refraining from a full parallel with linguistic analysis, Hornby refers to 'grammars': "and these grammars can and should be uncovered through musical analysis, in musical terms."[330] The standard phrases that constitute the grammar of the tractus are labelled as follows:[331]

0a, 0b, 0c (applied as an opening phrase of the first verse only)
1a, 1b, 1c, 1d
2a, 2b
3a, 3b, 3c
4a, 4b, 4c, 4d, 4f

[327] *Ibid.*, 43. Schmidt uses the word Floskel, Karp chooses 'motif': Karp 1998, 112.
[328] *Ibid.*, 44.
[329] Hornby 2009, 28ff.
[330] *Ibid.*, 42.
[331] This is the same phrasing as in APPENDIX V.

In their respective positions, the phrase-types are associated with the accentuations in the text endings, sometimes in combination with certain parsing characteristics, *e.g.* the occurrence of a possessive pronoun.[332] Depending upon variant (standardised) accentuated phrase endings, numbers are added after the letter code, e.g. 2a1 for phrases 2a ending /– /–. Textual cues and variant melodic material may distort the four 'standard' tractus phrases, linked to the *cola*, the textual backbone for tractus verses. Two situations may override the grammatical principles as identified by Hornby: text cues and variant melodic material.[333] These phrases (Schmidt calls them *Unregelmäßigkeiten*, anomalies[334]), by their variant characteristics in the standard phrases 1 to 4 draw the attention of the (professional, trained) audience. Like microtonal inflections, Hornby defines them as "emphatic phrases".[335] She convincingly demonstrates that the emphatic phrases are employed as an annotation tool that accentuates the *auctor's* intention to highlight his Patristic interpretation of the text linked to the chant text involved. By their systemic qualities, emphatic phrases are in turn part of a formulaic system as well. From a semiotic point of view, they are musemes, or more specifically, encoded signal-vehicles. A summary of Hornby's emphatic labels occurs in the core repertory (defined in *table* IV.1), which also refers to text units 'below' the phrase level, i.e. on the *comma* level and a few on the *syllabae* level.[336] The melodic elements on the *comma* level are without clear structural positions, transcending standard phrase material. Rebecca Maloy encountered similar melodic annotation techniques applied in offertories;[337]other rhetorical tools with similar annotation effects will be presented in paragraph IV.5.

Hornby listed the emphatic phrases and explored the interaction between melody and rhetoric for each of the tractus analysed.[338] As referred to in Chapter II, for this exploration, Hornby distinguishes between "aspects integral to the composition" and "ornaments" like the *quilisma* and the *oriscus*, which she considers as dependent on

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[332] *Ibid.*, 52.
[333] Hornby 2009, 45.
[334] Schmidt 1958, 19.
[335] Hornby 2009, 74ff.
[336] *Ibid.*, 64ff.
[337] Maloy 2010.
[338] Hornby 2009, tables 9-12.

performative whims of the cantor and not of interest for her analysis.[339] As a consequence, with a few exceptions, her analysis plays on *cola et commata* levels, not on the levels of *syllabae*, where the microtonal inflections come into play. Because "ornament" in current musicological terminology refers to 'embellishment', it will be clear that it does not apply

Label	**Characteristics**
Cola	
Phrase 1e	A defined larger oscillation than in phrases 1a-1d.
Phrase 1f 1G,	As 1e and part of a melismatic figure of two, repeated six note elements.
Phrase 2b4	A phrase with an opening differing from 2a and 2b.
Phrase 2c	Characterised by a more decorated melisma.
Phrase 2d	This phrase reaches a distinctly higher note compared with 2a, 2b.
Phrase Z	At beginning and end of verses, related to texts expressing 'evil'.
Commata	
Comma*	Emphasising important words or linking text in different verses.
Phrase X	A formula not related to a fixed position in the 4 phrases.
Comma X	The same formula, functioning as comma.
Comma Y	A distinct melodic formula without a fixed position.
Syllaba	
Syllaba V, W	Not part of a larger phrase, underline short text fragments at verse openings.

Table IV.1. Hornby's emphatic labels.

to the parapitch as previously stated. From the tractus of the second mode mentioned in Hornby's book,[340] all verses containing microtonal inflections were analysed:

[339] *Ibid.*, 80.

[340] Karp classifies *De necessitatibus* as one of, if not the oldest second-mode tractus (Karp 1998, 102). Hornby explains why she does not consider this chant as belonging to this genre (Hornby 2009, 122ff.).

Older core repertory	Frankish repertory[341]	
Qui habitat	*Eripe me*	*c*830?[342]
Deus deus meus	*Audi filia*	*c*900
Domine exaudi	*Confitemini*	*c*900
Domine audivi	*Tu es Petrus*	*c*900

Although scholars' opinions differ about when and how the common predecessors of the Romano-Frankish and Old Roman second-mode tractus developed,[343] there seems to be agreement about the division between an older core repertory and a Frankish repertory as indicated above. Of the older repertory, Peter Jeffery estimates *Deus deus meus* and *Qui habitat* to have the most ancient origins.[344] Theodore Karp and Hornby categorise *Eripe me* as respectively the youngest of the older repertory and (possibly) the oldest of the Frankish repertory, which Hornby tentatively dates between *c*790 and *c*830.[345]

Incipit_Mai	Domine exaudi	Genre	Tractus	Mode	2	Cantus ID	g00876	Example	4.18
Incipit Verse	Domine exaudi	NrVers	01			Nr. of Mif Cases	5	All	

	Verse Text	MSS	Phrase Types EH	Code		Translation Emma Hornby
1	Do-mi-ne ex-au-di	2: Dij, Ult1 1&2:	0a-	1	2	Lord hear
2	o-ra-ti-o-nem me-am	Sta	2a1	2	3	my prayer
3	et cla-mor me-us	Ult1	3c (0b, see remark)	3	2	and [let] my cry
4	ad te ve-ni-at.	Dij, Ult1 (2x!), Ach	4e	4	3	come to you
5		Dij, Clu, Ult1		5		
6				6		
7				7		
8				8		

Word	ex-au-di	o-ra-ti-o-nem	cla-mor	te	
Expression					
Trigger 1	M3:Pleading	M3:Pleading	M6:Complaint	M1:Respect	
Trigger 2					

Bible Text	Psalm	101[102]:2	Augustine	Enn. 101:3		
Utrecht Psalter	--	https://goo.gl/RkB7VR	Neale & Littledale	3	281	https://goo.gl/DXDoMX

Fig. IV.2. The functional analysis of microtonal inflections in the second-mode tractus.

[341] The fifth Carolingian tractus presented by Hornby is *Diffusa est gratia*. Because it is missing in all sources analysed by me except for Clu, it was not taken into consideration here.

[342] Hornby 2009, 137.

[343] Cf. McKinnon 2000, Pfisterer 2002, Karp 1998.

[344] Jeffery 2003, 65, 69.

[345] Hornby 2009, 138.

Each of the resulting 48 verses of the combined Roman – Frankish repertory was analysed according to the template shown in *fig.* IV.2, representing slightly over 200 microtonal inflections in the six manuscripts analysed (see APPENDIX VII). The verse texts in blue print reflect phrases labelled 'emphatic' by Hornby. Her translations in most cases rely on traditional English Bibles, but by providing 'direct translations', she adapted the English phrases where the Latin *cola et commata* of the psalters consulted required such action. Incidentally, she departs from traditional wordings in order to better highlight emphatic aspects in the text. Bold and underlined text, irrespective of its colour, indicates the presence of microtonal inflections in the notation. Under the header <Phrase Types EH>, one may find the labels as they appear in Hornby's Appendix I, of which *table* IV.1. above is a summary. The meaning of the fields under <Code> will be explained in paragraph 3. The remaining fields of this template are identical to those in the exploratory analysis. In APPENDIX VII, if a number appears in a green field to the right of the field <Utrecht Psalter>, it relates to a word or expression with microtonal inflections in at least one of the six sources consulted, which is part of a biblical scene on the folio referred to in the Utrecht Psalter.[346] All URLs in blue directly link to the indicated folios.

All occurrences of microtonal inflections could be rhetorically contextualised. Again, the rhetorical hypothesis was confirmed in all cases, stressing the indexical character of the microtonal inflections as an encoded signal. A summary of the categories is shown in *table* IV.2. below. Details can be found in APPENDIX VII.

[346] The Utrecht Psalter is an illustrated Psalter, created in Reims around 830 for Louis the Pious, Charlemagne's son and successor or for Louis' wife Judith. It is kept at the Utrecht University library. Interpretations are according to comments by Koert van der Horst in: Van der Horst and Ankersmit 1996.

MSS	Negative Affects		Positive Affects		Loci		Logic		Total	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%	Abs.	%
Dij	12	16	27	36	28	38	7	9	74	100
Clu	4	22	4	22	9	50	1	6	18	100
Ult1	12	17	21	30	30	43	6	9	69	100
Ach	5	22	4	17	10	43	4	17	23	100
Sta	3	8	11	30	19	51	4	11	37	100
All MSS	36	16	67	30	96	43	22	10	221	100

Table IV.2. The aggregated results of the analysis.

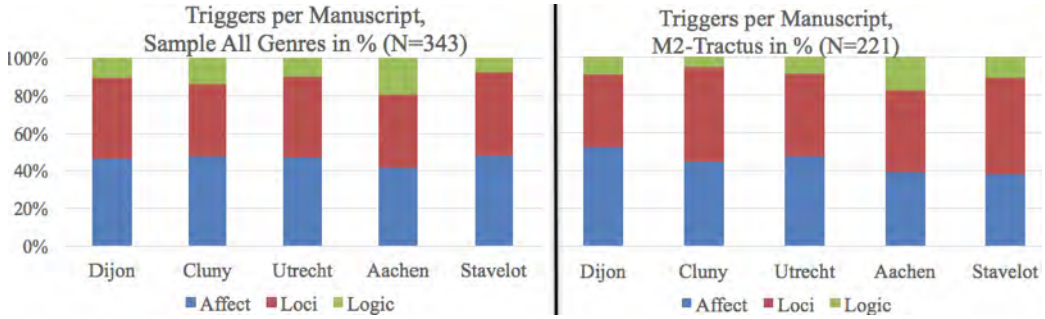


Fig. IV.3. The distribution of triggers.

The distribution of the rhetorical categories in the sample (APPENDIX VI all genres, left diagram) and in the second-mode tracts are quite similar (see *fig.* IV.3.).

IV.2. The Melodic Grammar of Microtonal Inflections in Second-Mode Tractus

Guided by the verbal text and within the constraints of *recte et bene dicendi*, the *auctor* could apply rhetorical accents with microtonal inflections "when he felt like it". But did any *musical* constraints apply to *recte et bene modulandi*? From early times on, all treatises refer to the diatonic genus as the most important genus for chant, followed at a distance by the enharmonic genus. Apart from many other details, one of the main grammatical rules seems to be that the liturgical musical 'language' should in essence be diatonic. If indeed the diatonic genus was the guiding principle for the transmission of Romano-Frankish chant (and its predecessors?), the melodic relations between microtonal material and the diatonic framework must have been defined. If so, what where the decisive parameters? In other words, did a musical grammar for the employment of microtonal inflections in their diatonic context exist? As referred to in the previous chapter, an extensive tradition of

linking musical to grammatical concepts existed during the Middle Ages; a confirmative answer thus seems possible.

During the exploratory analysis, it became clear that the employment of microtonal inflections is facultative; the *auctores* (read: local traditions) may have had different views about which words to highlight. As a consequence, phrases might appear with or without microtones. If local traditions indeed differ in this respect, comparisons of melodic fragments with or without microtones only make sense when tested for chants of genres in which the tradition resulted in identical or highly similar texts and (diatonic) melodies. Tractus of the second mode have this quality. In addition, the genre is formulaic and in her book about the second-mode tractus, Hornby convincingly identifies links between its variant melodic phrases and the highlighting of patristic texts. All in all, a case study into the profile of microtonal inflections and the assumed melodic constraints for their employment in the tractus of the second mode seemed like a good choice.

The textual and melodic material of the second-mode tractus provides enough melodic stability for comparisons between traditions with observed microtonal inflections (the six manuscripts analysed here) and traditions where this phenomenon did not receive attention (material from Hornby's analysis). Finding melodic constraints for the employment of microtonal inflections in a diatonic setting was made easier by two characteristics of the phenomenon itself. The first was mentioned in Chapter II: in the sample, a microtonal inflection is not notated as a separate pitch of the scale but *always* as a downward inflection from a preceding supersemitonal pitch,[347] which is *fa*, *do* or b^b. The second is the facultative character of the phenomenon. It appeared that out of the six manuscripts, always one or two do not have microtonal inflections where the others do. The essence then, was to check whether the supersemitonal pitches *as part of the (assumingly identical) diatonic main frame* remain in place if a microtonal inflection is added, or whether the employment of microtonal inflections leads to shifts in the positions of supersemitonal pitches, thus accommodating the employment of these microtones.

For APPENDIX VII, two sets of comparisons were drawn up. Firstly, a comparison between melodies from the sources consulted for this thesis with and without microtonal inflections. All manuscripts belong to traditions which include microtonal inflections, so one could object against such a one-sided selection. For that reason, in a second set of

[347] In Dij, the microtonal inflection may occur without a preceding supersemitonal pitch; in most cases, it is followed by such a pitch. Gmelch (1911, 66f.)

comparisons the same melodies from the first set containing microtonal inflections are posed against the phrases transcribed in Hornby's analysis, without a (known) microtonal tradition. Due to the *campo aperto* notation in Clu, I decided to avoid discussions about which pitches the neumes represent in this manuscript and consequently did exclude the chants from this source from the analysis.

In APPENDIX VII, each of the verses was analysed in the template shown in *fig.* IV.4, which is the extension of the database record underneath the template shown in *fig.* IV.1. The melodic analysis, in the upper right-hand corner above the staff, contains two codes referring to supersemitonal (SST) pitches in the six manuscripts and the examples shown in Hornby's manuscripts respectively. In *fig.* IV.4, '2' stands for identical positions, '1' for similar positions and '0' for unrelated positions. 'MIf' stands for microtonal inflection. In each phrase, the occurring microtonal inflections are presented first against a yellow background, followed by diatonic melodies without microtonal inflections in the other manuscripts of this study and Hornby's examples respectively. In the notation, for better visibility, supersemitonal pitches and microtonal inflections are printed in red and essential passages are indicated by additional vertical single-line bars. In total 130 microtonal inflections were compared (the same occurrences in several manuscripts were not taken into consideration) in the two sets described above.

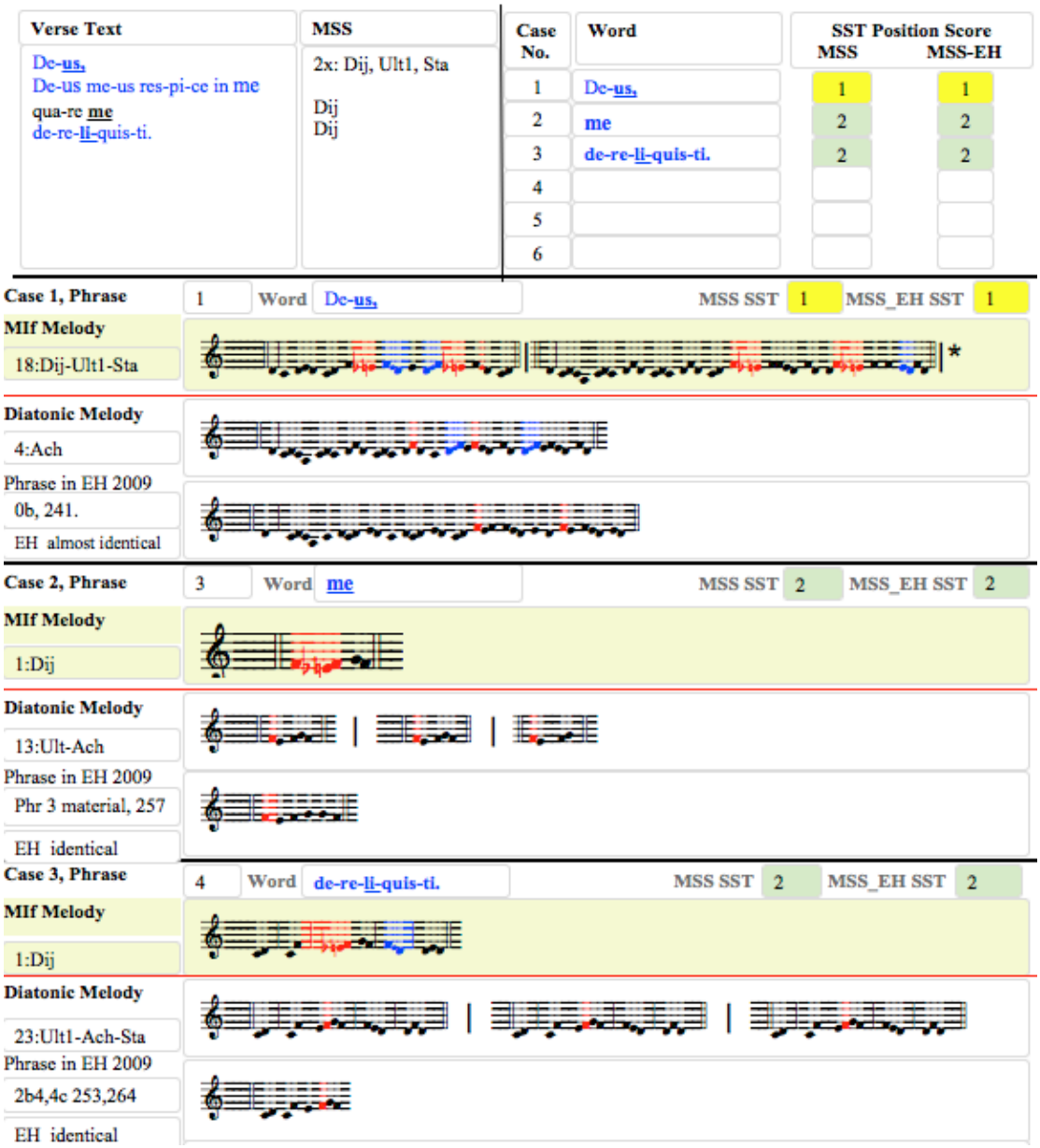


Fig. IV.4. The analysis of melodic grammar: *Deus deus meus*.

The results seem to confirm the existence of a prescriptive diatonic framework that acts as a melodic constraint for the employment of microtonal inflections. Both comparison sets scored 2 for all cases concerned in 42 out of 48 examples plus some scores of 1 points, totalling 89% of the maximum score.[348] In most cases, it were differences in the Dij manuscript that prevented a 100% score. See APPENDIX VII for details. The results apply

[348] The nonmatching cases in effect were caused by different regional melodic settings of the chants concerned, not by shifted supersemitonal pitches in melodies that are identical.

only to chants (a) in these manuscripts, and (b) for the second-mode tracts. Further research is needed to confirm this hypothesis in broader contexts.

In the exploratory analysis as presented in Chapter II, a comparison between the accentuated syllables revealed 'shifted' microtones: in different manuscripts, for the same word, microtonal inflections appear on different syllables. In theory, these shifts might indicate intentionally adapted diatonic melodic frames in order to accommodate microtonal inflections. On the other hand, it may well be that the same diatonic melody allows for the shift, in other words, both positions of microtonal inflections are preceded by supersemitonal pitches. A comparison of cases in the second-mode tractus as shown in *table* IV.3 seems to confirm the latter:

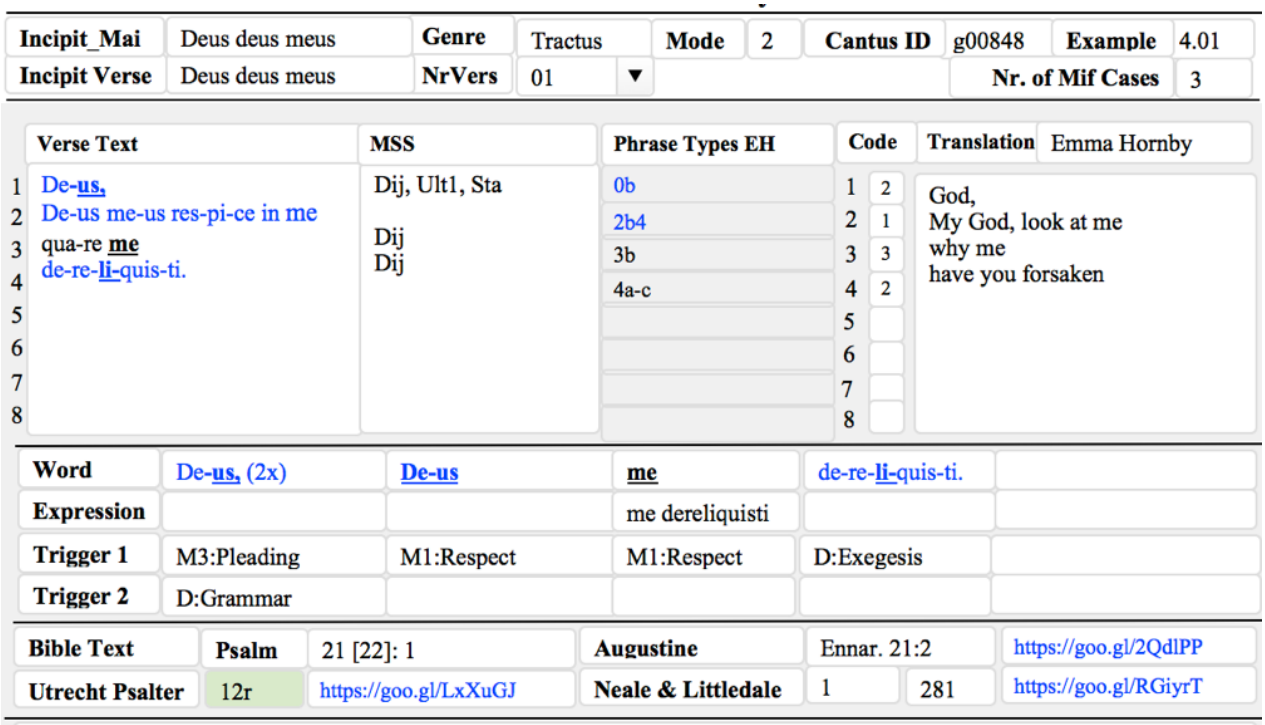
Incipit	Accent 1	Accent 2	MS 1, pitches	MS 2, pitches
Domine exaudi	**cla**-mor	cla-**mor**	Ult1: c, c	Ach: f, f
In medio duorum	cog-**nos**-ce-ris	cog-nos-ce-**ris**	Dij: f, f	Ach: f, f
Ne avertas	tri-**bu**-**lor**	tri-bu-**lor**	Ult1: c, c	Dij: f, f
Verum tamen	con-fi-**te**-bun-tur	con-fi-te-**bun**-tur	Ult1: f, f	Ach: f, f

Table IV.3. 'Shifting' microtonal inflections and diatonic melody.

Apparently, the *auctor* only could apply rhetorical accentuations in expressions where the diatonic frame, by supersemitonal pitches, allowed for a microtonal inflection. The conclusion seems justified, therefore, that for the manuscripts analysed, the employment of microtonal inflections from a *rhetorical* point of view was facultative and applied according to the artistic and theological insights of the *auctor* (Chapter II.4). However, their employment from a *musical* perspective was subject to constraints imposed by the diatonic setting of the main frame upon which the transmission of the sung liturgy was based. It was the *auctor*'s challenge to synchronize the musical tools expressing his rhetorical annotations within the prescriptive settings – the grammar – of the diatonic melodic tradition.

IV.3. A Comparison of Emphatic Phrases and Microtonal Inflections

Because Hornby's analysis is based exclusively on a diatonic framework and limited to phenomena predominantly on *cola et commata* levels, an evaluation including a) non-diatonic and b) *syllabae*, here microtonal inflections, seemed enticing in order to evaluate if and how the two traditions relate when occurring in the same melodic phrases.



Incipit_Mai	Deus deus meus	Genre	Tractus	Mode	2	Cantus ID	g00848	Example	4.01
Incipit Verse	Deus deus meus	NrVers	01					Nr. of Mif Cases	3

	Verse Text	MSS	Phrase Types EH	Code		Translation: Emma Hornby
1	De-us,	Dij, Ult1, Sta	0b	1	2	God,
2	De-us me-us res-pi-ce in me		2b4	2	1	My God, look at me
3	qua-re me	Dij	3b	3	3	why me
4	de-re-li-quis-ti.	Dij	4a-c	4	2	have you forsaken
5				5		
6				6		
7				7		
8				8		

Word	De-us, (2x)	De-us	me	de-re-li-quis-ti.	
Expression			me dereliquisti		
Trigger 1	M3:Pleading	M1:Respect	M1:Respect	D:Exegesis	
Trigger 2	D:Grammar				

Bible Text	Psalm	21 [22]: 1	Augustine	Ennar. 21:2		https://goo.gl/2QdlPP
Utrecht Psalter	12r	https://goo.gl/LxXuGJ	Neale & Littledale	1	281	https://goo.gl/RGiyrT

Fig. IV.5. Emphatic phrases and microtonal inflections: Example 4.01.

In *fig*. IV.5, under the header 'Phrase Types EH', the labels again appear as seen in Hornby's Appendix I. The numbers 1 – 4 in the next column under 'Code' relate to the text accentuations applied: 1) emphatic only; 2) emphatic plus microtonal inflection; 3) microtonal inflection only; 4) no accentuation. Aggregated, this resulted in *table* IV.4. The first and the third columns respectively identify cases with either emphatic phrases or microtonal inflections (QT = quartertones), whereas the middle column lists *overlapping* cases. The prominence of both phenomena in the first four phrases is to be seen in the context of the fact that only 16 out of the 48 verses analysed contain more than four phrases; there is no connection to more or less interaction between rhetorical and melodic elements. The employment of microtonal inflections and emphatic phrases results in a blurred picture. On the one hand, microtonal inflections do occur both within emphatic phrases and separately; on the other hand, emphatic phrases do not necessarily

	Emphatic	Emphatic & QT	QT	Total
Phrase 1	9	9	10	28
Phrase 2	8	6	16	30
Phrase 3	5	7	15	27
Phrase 4	3	5	19	27
Phrase 5	1	3	7	11
Phrase 6	1	0	2	3
Phrase 7	0	1	1	2
Phrase 8	0	1	1	2
	27	32	71	130

Table IV.4. Accentuations by emphatic phrases and microtonal inflections.[349]

contain microtonal inflections. As musemes, microtonal inflections require less syllables than emphatic phrases; consequently, the higher frequency of microtonal inflections in the table should not come as a surprise. It seems, however, that the employment of microtonal inflections has no systemic relation to the occurrence of emphatic phrases.

If the workings of rhetoric-accentuating tools are considered as categories of formulaicy, there seems to be no clearly defined correlation between the employment of these two categories. Frequent overlaps are the result. Filtering these stacked musemes according to the rhetorical triggers to which they might relate (affect, logic or *loci*) did not provide further insights. The numbers from *table* IV.4. became far more interesting, however, when earlier and later compositions were separated (see *table* IV.5.).

Repertory	Emphatic	Emphatic & QT	QT	Total	Phrases	Cases/Phrase
Older repertory	27	31	49	107	159	0,7
Frankish						
Eripe me	0	0	17	17	37	0,5
Younger	0	1	5	6	20	0,3
Subtotal Frankish	0	1	22	23	57	0,4
Total	27	32	71	130	216	0,6

Table IV.5. Accentuations, diachronic.

[349] The total of 130 cases refers to the observation of at least one microtonal inflection per phrase. The encoding only indicates whether the phenomenon occurs in a phrase or not. How often microtonal inflections occur in this comparison is not of essence. This means that the number of occurrences of microtonal inflections in a phrase has not been taken into account. This explains the difference with the 200+ occurrences mentioned above.

One observes a dramatic diachronic decrease of accentuations by way of both emphatic phrases and microtonal inflections from 107 in the older repertory to 23 in the Frankish repertory, in absolute numbers and expressed in relation to the number of phrases per 'repertory'. Emphatic phrases disappear completely and microtonal inflections in the youngest layer of the repertory have shrunk to 45% of the cases per phrase in the older repertory.

In the semiotic terminology as presented in Chapter III, the numbers for the emphatic phrases seem to strongly indicate a shift from SR4 to SR3: the shift from a performance containing encoded meanings towards one in which melodic variants are experienced as uncomprehended *Unregelmäßigkeiten*. In SR4, chant contains emphatic phrases acting as musemes transmitting encoded meanings between the *auctor* and the audience, namely, a rhetorical annotation referring to Patristic comments. In SR3, that link, that understanding is lost. This hypothesis only addresses the switch; it cannot deduce *when* this shift occurred. It is not unthinkable that the emphatic meanings were already lost when the Roman liturgy was introduced north of the Alps. In that case, it was only the Carolingian *tradition* that required their performance to be transmitted to them from older (presumably Roman) liturgies, period. Hornby's observations seem to confirm this shift for the younger tractus:

> The understanding of the genre at the time of their composition (the Frankish tractus, LL) was not sophisticated and rhetorically nuanced, and does not follow the same formulaic principles as the core-repertory chants (the four older tractus: *Qui habitat*, *Deus deus meus*, *Domine audivi* en *Domine exaudi*, LL) It is thus clear that the state of the core-repertory second-mode tracts in the notated manuscripts dated c.900 is not a function of their notation, but is a well-remembered written reflection of a long oral tradition.[350]

In the light of the virtual disappearance of emphatic phrases in the younger repertory, for this present tool, it seems that "well-remembered" is not equal to "understood". Phrases that reflect emphatic meanings in the older core repertory have become mere melodic formulas in the younger repertory.

For microtonal inflections, *table* IV.5 sketches a somewhat 'brighter' picture. With all the caveats in mind when interpreting quantitative data for this facultative phenomenon, one can see a slight shift towards more affect-related triggers (*fig*. IV.6). There are less occurrences in the younger layers of the repertory, but the tradition stays alive because one

[350] Hornby 2009, 182.

encounters microtonal inflections with the same functional text links – also in new compositions – until the middle of the thirteenth century in manuscripts and until the fifteenth century in chronicles, reflecting the reception of microtonal intervals at least at a level of SR3. One may assume that the number of participants on the SR4 level gradually declined, if thirteenth-century chronicles indicate that the enharmonic genus was no longer sung anymore, even at court.

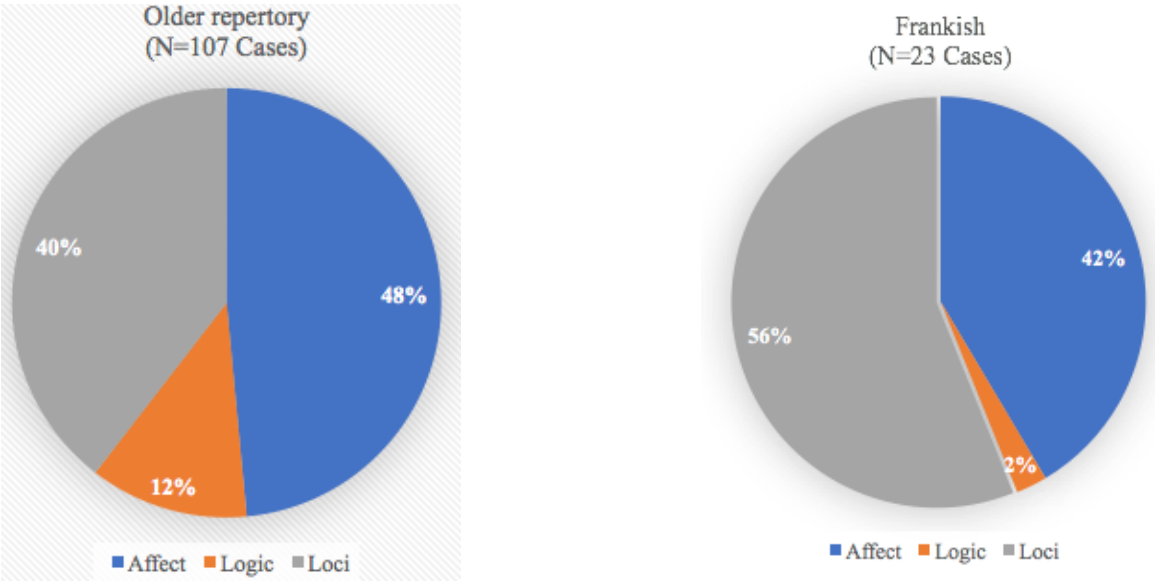


Fig. IV.6. Microtones: shifts in rhetorical categories between Older and Frankish repertory.

These observations might be isolated cases, but they are covered by all manuscripts in the sample. Nevertheless, more manuscripts will have to be analysed in order to demarcate its impact on the contemporaneous traditions that have survived in notation form.

IV.4. The S-files: Non-Diatonic Traditions in the Utrecht Office

The semitonal alterations observed in Chapter II are backed by theoretical considerations as described in *Scolica Enchiriadis*, a dialogue between a master and his pupil.[351] It was originally written during the ninth century and was one of the most widely disseminated musical treatises during the eleventh century.[352] Although it had previously been attributed

[351] Maloy 2009, 74. Rebecca Maloy and Calvin Bower both consider the Scolica Enchiriadis to be a pedagogical construct.
[352] Meyer 1996, xi.

to Hucbald, this view has been challenged.[353] The *Scolica Enchiriadis* is considered a pedagogical, practical instruction or guide for performing chant 'correctly'. Though in essence modal, its basic concept allows for non-diatonic semitones: E^{b}, $F^{\#}$, $c^{\#}$ and even, in specific cases, $g^{\#}$. The phenomenon is described in detail by, amongst others, Gustav Jacobsthal, Charles Atkinson, and Rebecca Maloy.[354]

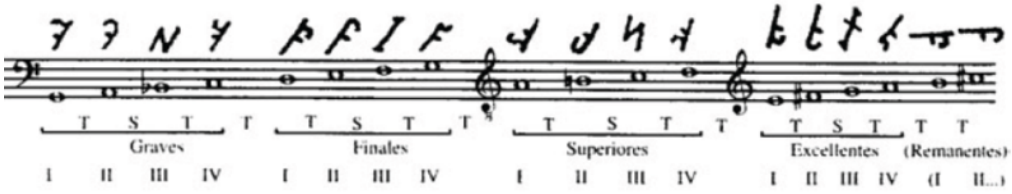


Fig. IV.7. The *Scolica Enchiriadis* tone system.[355]

The basis for Hucbald's considerations (*c*900) and those of Guido d'Arezzo (*c*1000) was around a Greek octave of two conjunct tetrachords with fixed positions of the semitones. The *Scolica Enchiriadis* system, however, consists of four disjunct tetrachords, replicating at the fifth rather than at the octave. The pitches (I: *protus*, II, *deuterus*, III *tritus*, IV, *tetrardus*) are classified according to their positions within in the respective tetrachords, called *graves*, *finales*, *superiors*, and *excellentes* (see *fig.* IV.7.). From the introductory sections of the *Enchiriadis*, it is clear that the system is to be seen as a modal one, as suggested by the names of the pitches in each tetrachord. For semitones, the tradition was far more flexible in comparison to Guido's approach. Nevertheless, *Enchiriadis* labels these pitches with pejorative terminologies: *vitia, absonia* and *dissonantia*.

These refer to wrong intonations in phrases, an irregular semitone and a wrong intonation in responsorial chant respectively.[356] In the pedagogical dialogue, the master elucidates the variant pitches based upon the situation in the second tetrachord, the *finales*. He explains *vitia* as the lowering of the second tetrachord interval by a semitone from E to E^{b}. The second variant, the *absonia*, exists in raising the third pitch by a semitone, in the finales tetrachord resulting in $F^{\#}$. Because the system consists of disjunct tetrachords,

[353] Hoppin 1978, 189.
[354] Jacobsthal 1897; Atkinson 2008; Maloy 2009.
[355] Maloy 2009, 73.
[356] *Ibid.*, 76.

the reasoning was that the defined variant semitones in one tetrachord were 'possible' in the other tetrachords as well. This results in an 'authorised' B-natural in the *graves* tetrachord, $c^{\#}$ in the *superiores* and $g^{\#}$ in the *excellentes* tetrachord. Subsequently, the master explains *why* he allows for these variant, non-diatonic pitches:

> Vitia nimirum sunt sed sicut barbarismi et soloecismi metris plerumque figulariter intermiscentur ita limmata interdum de industria cantibus inseruntur.[357]
>
> [Certainly, they are errors, but just like as barbarisms and solecisms are figuratively intermixed into verse, so semitones are sometimes intentionally inserted into chants.][358]

In this light, the master's advice could even be interpreted as reflecting the *facultative* character of non-diatonic pitches. It seems that in the *Enchiriadis* tradition, these modulations are permissible if the text requires additional 'poetical' underlining. Maloy refers to Donatus's remarks in his *Ars maior* about barbarisms and solecisms adding *poetical* qualities.[359] Donatus even distinguishes barbarisms by tone, which – considering them to be permissible – could be applied to non-diatonic pitches.

> Barbarismus est una pars orationis vitiosa in communi sermone; in poemate metaplasmus […] Barbarismus fit duobus modis, pronuntiatione et scripto. His bipertitis quattuor species subponuntur: adiectio, detractio, inmutatio, transmutatio litterae, syllabae, temporis, toni, adspirationis. […] Toni quoque similiter per has quattuor species conmutantur, nam et ipsi adiciuntur, detrahuntur, inmutantur, transmutantur, quorum exempla ultro se offerent, siquis inquirat.[360]
>
> [Barbarism is a bad part of speech in ordinary speech, in poetic discourse it is called metaplasm. […] Barbarism occurs in two ways: in delivery and in writing. These have four types each: addition, subtraction, changing and transposing of letters, syllables, tones and aspiration. […] ones also are changed in these four types, for they too are added, subtracted, replaced and transformed, of which many examples can be found if one looks for them.[361]]

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[357] Gerbert and Schmid 1981, 70. Quoted in Maloy 2002, 77, fn 25.

[358] Translation Maloy 2009, 76f. Solecisms: [Greek: soloikismos] an ungrammatical combination of words.

[359] Maloy 2009, 77.

[360] Donatus 2010, 653.1ff.

[361] Donatus n.d.

Maloy describes the methods employed by later scribes to avoid or correct the 'errors' that were allowed by the *Scolica Enchiriadis* pitches, which for the most part consist of modal shifts and modified separate pitches, especially when, after the introduction of the staff, the variant pitches had to fit on or between the lines.[362]

In Ult2, the scribes presumably still adhere to the sounding local *usus*, permitted by the *Scolica Enchiriadis*, rather than to the strictly diatonic implications of the staff, as intended by Guido. In the S-files, they do not apply tools to avoid the *Scolica Enchiriadis* pitches; they even combine them with microtonal inflections in the same verses, sometimes in the same phrases. Interpreted from a rhetorical perspective, the 's' alterations, as *Scolica Enchiriadis* pitches deviating from the diatonic genus, indeed seem to imply Donatus's poetical qualities. The foregoing analysis sets the modal shifts in a completely different light. Without implying at this stage that all modal shifts can be deduced to corrected, non-diatonic, no-longer-understood musemes, it seems justified to assume that they were frequently applied as such. An analysis of one of the classical, more complicated modal shifts in the communion *Beatus servus* (see below) appears to confirm that in the present context, modal shifts deserve more attention. The outcome of the following paragraph strongly suggests that next to non-diatonic pitches and emphatic phrases, also modal shifts, liquescent notes and stacked musemes can be dynamical indicators of rhetorical intentions. 'Dynamical' here refers to observed diachronic developments in musemes. The awareness of such developments might contribute to a better understanding of transmission processes (paragraph IV.6).

IV.5. Melodic 'Othernesses' as Musemes

In general terms, in Romano-Frankish chant and Old Roman chant, melody supports the text. Godehard Joppich, in his analysis of the episemes and *litterae significativae* applied in Einsiedeln Stiftsbibliothek Codex 121, demonstrates the prosodic qualities of melodies implied by the notation. They follow the text, melodically accentuating its messages.[363] In

[362] Maloy 2009, 79ff.

[363] Einsiedeln, Stiftsbibliothek Codex 121: a codex with one of the oldest-known notated Gradual and sequences, assumingly composed (c960-c970) by Notker of St. Gall. Cf. Joppich 2013.

this respect, as observed in Chapter II, the distinction between *vertonen* and *betonen* is important when interpreting links between text and melody. Along similar paths, Eugène Cardine seeks to interpret the performance of the earliest written (diatonic) stages of Romano-Frankish chant by *betonen*. The non-diatonic musemes described in essence are prosodic accents. As encoded signal-vehicles, they add certain meanings to words. However, these prosodic tools definitely belong to a different accentuation category than the ones that Cardine must have had in mind, because they stand out from the diatonic 'flow' and seek to reach the audience with a content that goes beyond the pure auditive reception of a text. As musemes, these non-diatonic pitches additionally make the audience aware of certain rhetorical connotations that the *auctor* intends to transmit.

Contrary to what are in essence palaeographical interpretations of symbols representing non-diatonic pitches, the emphatic phrases as identified by Emma Hornby have no prosodic qualities. Nevertheless, the intended effects on the audience are meant to be identical to those of the acoustically distinguishable musemes. Their functionality – like that of non-diatonic pitches – is based on the reception of formulaic variants amidst formulas, *i.e.* standardised material. The emphatic phrases merely differ by their variant formulas, employed as formulaic material; there is no generic shift – even the modus remains unchanged.

The common denominator for all melodic tools that support text understanding is otherness. This otherness was presumably one of the essences of earlier performance traditions, which must have been predominantly characterised by formulas.[364] Once the musical culture became increasingly dominated by modal and diatonic considerations, most othernesses became pejorative *Unregelmäßigkeiten* whenever modal, diatonic principles were affected by them. Starting at simple levels, *e.g.* a microtone referring to respect for the Lord, otherness reaches higher grades of complexity and sophistication when, for instance, a microtonal inflection refers to an Augustinian comment on a biblical metaphor. For better text understanding, rhetoric 'carries' major parts of otherness, but it has a lesser impact in transmitting messages in otherness defined by variant formulas that

[364] More details in paragraph IV.5.1. 'Modal' shifts. It seems enticing to distinguish between periods like 'Early Roman', 'Pre-Carolingian', 'Older', and 'Younger Frankish'. However, theoretical and performative traditions during the seventh and until the ninth century are far too blurred to even try to apply a defendable (falsifiable) periodisation. It was considered prudent to refer only to 'younger' and 'older' periods.

largely stay below the audible surface, like emphatic phrases. In the next paragraphs, some additional musemes will be presented as tools of otherness that are connected to and occur in combination with non-diatonic pitches, especially microtonal inflections. These additions are essential for a more coherent picture of possible transmission patterns, to be presented in paragraph IV.6.

IV.5.1. 'Modal' Shifts

The parentheses in the header refer to the anachronistic employment of this concept when discussing the musemes assumingly related to it. Hucke and Huglo convincingly show that until the thirteenth century, in Rome, modal considerations were not relevant as a systemising principle for chant.[365] The eight church modes were introduced by the Franks. If there is agreement about the assumption that musemes may represent older traditions and that after the introduction of the staff in the Romano-Frankish performance traditions modal changes within a chant were increasingly considered as unsystemic, something needs additional explanation. In an attempt to untangle the problem, it must first be addressed from the perception in the Romano-Frankish tradition.

Generally speaking, for Romano-Frankish chant (and for the Old Roman tradition as notated from the eleventh century onwards), a chant should comply with the modal theory. This implies that – among other requirements – theoretically, the complete chant is to be performed in one modus and that this modus is based upon the diatonic genus. Modal shifts occur when at a given moment within a chant the characteristics of the opening mode no longer apply. There are three explanations for Romano-Frankish *auctores* applying modal shifts: firstly, by mistake, secondly, as a rhetorical figure (as assumed by John Mahrt, see below) and thirdly, as a correction that aims at avoiding non-diatonic pitches. All three employments were perceived as theoretically flawed. Nevertheless, the last two examples were accepted by younger traditions or perceived as 'necessary' in order to avoid non-diatonic pitches.

We now turn to an assumedly older perspective, here represented by the principles laid down in the *Scolica Enchiriadis*. Within an explicitly modal framework, disjunct tetrachords were the theoretical base units. In performance, however, a number of

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[365] Hucke 1980, 442. Huglo in "Les Tonaires" also convincingly rejects modal thinking before the Franks applied the church modes. Huglo 1971.

accidentals were allowed as encoded signal-vehicles. As will be shown below, shifts in the originally tetrachordial diatonic tonal areas and added accidentals in the increasingly modal and diatonic context in younger traditions were perceived and consequently reworked as modal shifts. In order to avoid conflicting and anachronistic definitions as much as possible, I will avoid terminologies referring to modal shifts except when explicitly applicable and instead refer to 'tonal area shifts'. Until quite recently, the *compositional, rhetorical* intention of tonal area shifts, later perceived as modal shifts, went unnoticed and modal shifts consequently, per definition, were either seen as 'mistakes' or as consequences of 'corrupted transmissions'.[366] In many cases, the following interpretation will apply: medieval scribes made mistakes in the tens of thousands of transcriptions that have survived. Of interest for the present study are the backgrounds of *intended* changes in tonal areas, of which I distinguish two kinds.

Firstly, modal shifts *as* rhetorical interpretations, like emphatic phrases, are *alterations* within the composition. However, instead of a formulaic alteration in accordance with the applicable melodic parameters of the mode in question, these musemes function by temporarily *changing modes* during a chant. For the offertory, Maloy shows how the earlier Romano-Frankish *auctores* – more than their counterparts as notated in the younger Old-Roman tradition – by adapting modal formulas (pitch strings beyond the given modal ambitus, modal shifts) "exploit the dramatic possibilities inherent in the lyrics […]".[367] This tradition was not limited to the offertory, as observed by William Peter Mahrt during the Cantus Planus International Conference in Dublin, 2016.[368] In '*Commixtio modi* and the expression of texts', Mahrt argues that medieval theorists defining *commixtio modi* as corrupt or defective chants overlooked what he calls "the positive purpose of the change for mode". Illustrating his assumptions by examples taken from seven chants in Mass and the Office, Mahrt underpins his hypothesis that the modal shifts accentuate text elements.[369] The same melodic variants may refer to several aspects

[366] De Loos 1999, 11.

[367] Maloy 2010, 139f.

[368] Mahrt 2016.

[369] The hand-out contains the antiphon Urbs fortitudinis (Cantus ID 005281), the offertory Exspectans exspectavi (g01210), the communion Principes persecuti (g01395), the introit Protector noster aspice Deus (g01200), the communion Cantabo domino (g01138), the introit Deus in adjutorium meum (g02026) and the responsory Gaude maria virgo (006759).

of the verbal text: "sometimes it highlights words referring to music or singing, and in some cases, it projects the overall sense of motion found in the text itself."[370]

Secondly, modal shifts can be interpreted as intended corrective transpositions in order to avoid 'wrong' semitones, occurring in tonal area shifts that might reflect *Scolica Enchiriadis* roots. If a scribe could not eliminate these semitones by a complete transcription of the chant concerned, he would apply a partial modal transcription, resulting in *commixtio modi* with the one and only intention to avoid a 'wrongly notated' pitch. These corrections begin to appear around the middle of the eleventh century after the introduction of the staff;[371] John of Afflighem (*c*1100) for complex cases like in the communion *Beatus servus* proposes up to three 'smoothing' techniques.[372]

The communion, originally performed as an antiphon with a psalm verse, is known for its multiple variants and inconsistencies in all aspects.[373] Karp and, more recently, Atkinson give extensive attention to *Beatus servus*. Their focus is on how *auctores* adapted the melody in order to avoid non-diatonic pitches in the older versions. The analysis below will concentrate on the constellation *prior* to the corrections by modal shifts, because the employment of non-diatonic semitones in Ult2 seems to indicate the presence of rhetorically relevant material in the text.[374] In *fig.* IV.8, the transcriptions from the Mass sources notated on a staff and analysed in this thesis are listed, together with Atkinson's reconstruction of the melody (based on Bern of Reichenau's remarks), presented as Example E.2 in his book *The Critical Nexus.*[375] *Beatus servus* is a communion mentioned in the earliest Tonaries, where it is always listed under the deuterus authentic mode (the third modus). Atkinson adds that these Tonaries do not contain any indications that this communion was somehow problematic at the time.

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[370] Ibid.

[371] Karp 1998, 408. See also: Ackermans 2012.

[372] Atkinson 2008, 242.

[373] Hiley 2009, 116.

[374] For metadata and links to the sources consulted, see APPENDIX VIII.

[375] Atkinson 2008, 236. "E.2. Beatus servus in its proper modal position."

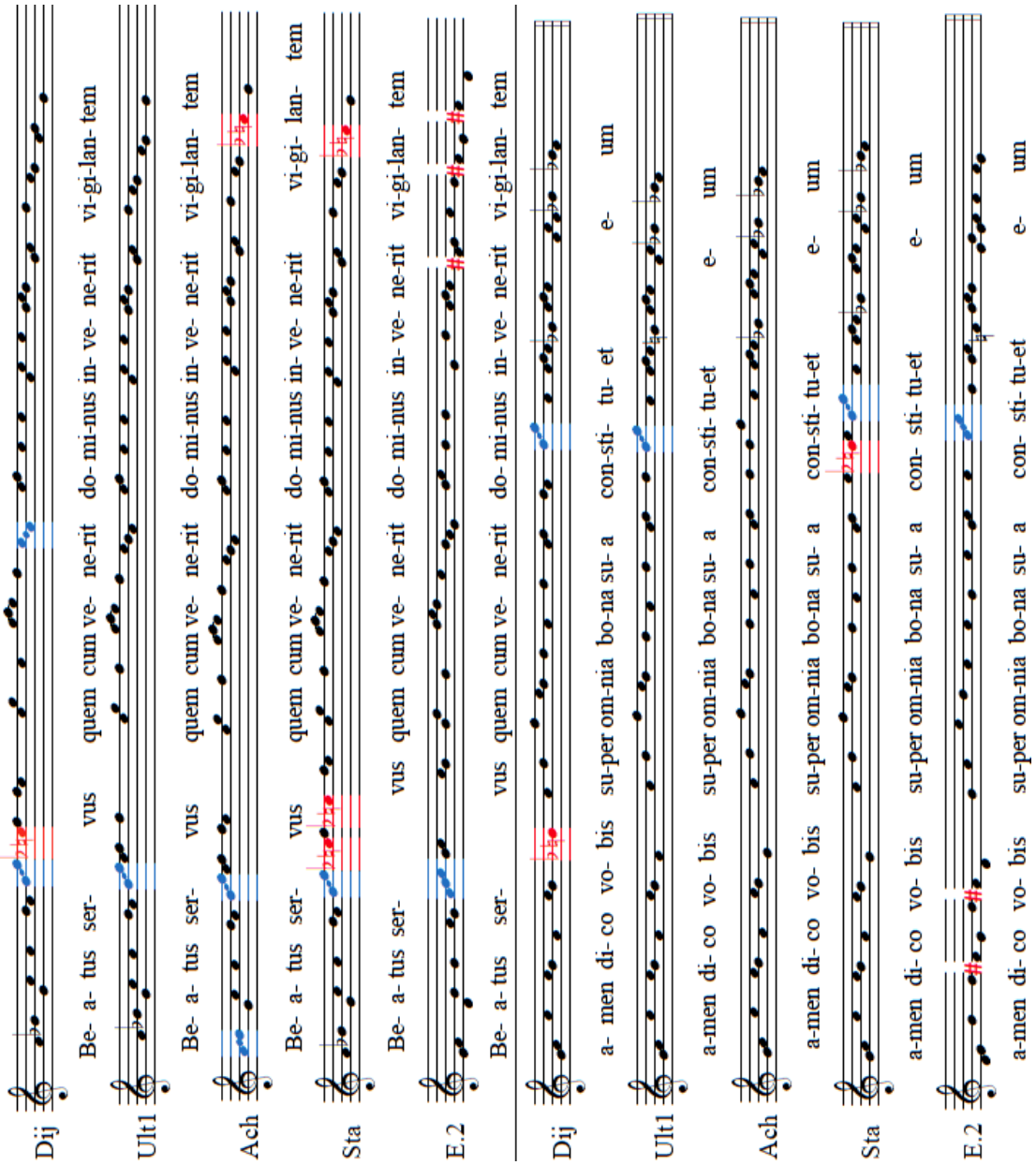


Fig. IV.8. Five settings of the communion *Beatus servus*.

The 'modal problem' in *Beatus servus* starts at *invenerit vigilantem*, where the interval at a semitone above the final shifts to a tone above it. Without transposing the chant from E to a, the melody at that point – as notated on a staff from a diatonic point of view – becomes problematic due to the F$^{\#}$s. The last transcription in *fig.* IV.8, the reconstruction by Atkinson, shows the *Scolica Enchiriadis* setting of the melody. Let us first concentrate on that setting. Its text is from Matthew 24:46,47 and it is sung at the feast of St. Sylvester (pope, died 335). Interpreted as parapitches, the F$^{\#}$s highlight the two underlined phrases.

Beatus servus	[Blessed is that servant
quem cum venerit dominus	whom when his lord shall come
invenerit vigilantem	he shall find him vigilant
amen dico vobis	amen I say to you
super omnia bona sua	over all his goods
constituet eum	he shall place him]

The F$^{\#}$s occur in two subsequent, almost identical formulas at both sides of the bipartite split in this communion, one in the cadence of the first part and the other in the intonation of the second part. In rhetorical terms, this repeated figure in two subsequently related texts is conceived of as an *ellipsis*, as already encountered in the tractus *Qui habitas*. The ending on D of the first phrase in a third mode chant is already quite uncommon; add the sharps to this formal issue and the rhetorical intention expressed by the *auctor* jumps out at the audience: a believer should always be vigilant and will be rewarded for it – for Christ may return at any given moment in time.

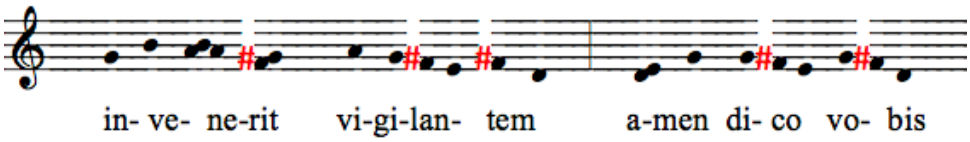


Fig. IV.9. *Beatus servus* (1).

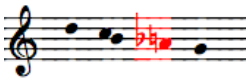
At the time when John of Afflighem and his contemporaries proposed modal solutions for 'wrong' pitches, the 'poetical' arguments allowing for them as proposed in the *Scolica Enchiriadis* were apparently no longer valid and their underlying rhetorical functions were no longer understood.

Now we turn to the melodies as notated in the five manuscripts. The diatonic contours of the five manuscripts match the solution offered by Bern of Reichenau (*c*978-1048, Abbot of Reichenau since 1008), identical to the third proposal by John of Afflighem: all scribes chose to transpose the final of the chant from E to a. But there are variants, some of which reveal new aspects of microtonal inflections. The first employment of a microtonal inflection reflects the standard rhetorical approach. In the intonation of *Beatus servus*, the scribe of Dij adds a microtonal inflection in ***ser****-vus*,

referring to respect because it relates to the ***beatus*** *servus*.[376] The Sta scribe adds a double microtonal inflection on the same syllable. The employments of the other microtonal inflections in *Beatus servus* nonetheless all have special aspects: on *vigilantem* (Ach and Sta), on *vobis* (Dij), and on *constituet* (Sta). The employment of microtonal inflections in *vigilantem* could perhaps be considered as the enharmonic translation of the chromatic semitones.

Looking at the rejection of chromatic and enharmonic intervals in chronicles, reflecting reception rather than theoretical considerations, it seems that the confusing *chromatic* semitones – branded as 'pernicious' by some authors – were rejectedearlier in time than microtones. The latter received a milder sentence; even Guido's stance on microtones is still not perfectly clear. As observed in Chapter I, enharmonic microtones were predominantly mentioned as (too) complex by chroniclers – or praised for their qualities until *c*1400. In both Ach and Sta, the microtonal inflections are notated as a *franculus* below a and in Sta as a compound neume including a liquescent. The pitch position on which the neume is applied (a) is not in line with the grammatical tradition, which prescribes a link to a supersemitonal pitch. If the neume can indeed be interpreted as indicating a pitch alteration, this would be the associative continuation of the older *Scolica Enchiriadis* semitonal practice. The rhetorical aspect remains unchanged for the scholars who would prefer to interpret the *franculus* here as a neume not indicating an adapted pitch but rather reflecting a longer duration: the effect is established by a rhythmic figure.

Sta, Ach



E.2.

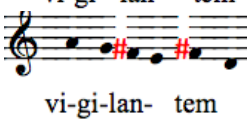


Fig. IV.10. Microtones and sharps in *Beatus servus*, *vigilantem*.

[376] This formula is frequently observed in Ult2, referring to Lambertus, Willibrordus, and other saints.

In the opening phrase of the second part of the communion, in Dij, a microtone is applied in *vo-**bis***. The notation is somewhat ambiguous: in the manuscript, it looks as though the special sign for the microtonal inflection ∂b^{b}- is added as a later correction to the original g.[377] A string of these two pitches is highly unlikely in the Dij tradition. The pitch sequence is indicated in *fig*. IV.11.

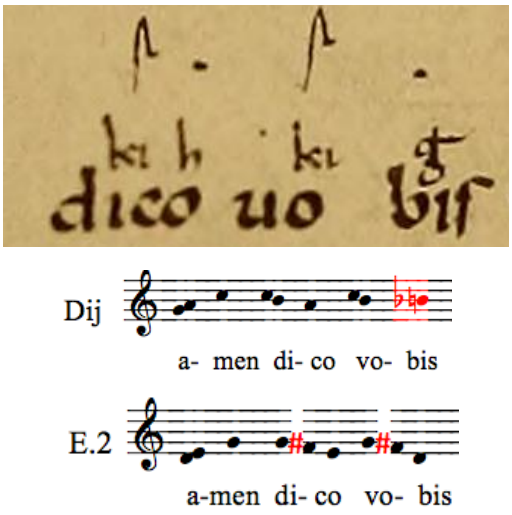


Fig. IV.11. Microtones and sharps in *Beatus servus*, *vobis*.

For this microtone, one fails to find an evident rhetorical context other than– in my view – an unconvincing interpretation that the microtonal inflection in *vobis* stands for annotating the whole expression *amen dico vobis*. However, the associative employment of the F$^{\#}$ in *vobis* in the precedent *Scolica Enchiriadis* tradition here seems to provide a better explanation. Of the five manuscripts analysed, Sta is still 'breathing' the *Scolica Enchiriadic* style the most. The microtonal inflection in ***con**-sti-tu-et* is a regular narrative underlining of the aspect of confirmation, but it is highly remarkable that the ever so concise scribe in Sta, in this particular chant, applies a microtonal inflection. It even seems to repeat a c$^{\#}$ sounding pitch by applying the latter compound neume on a c$^{\#}$ position

[377] The microtonal punctum here – as observed by Josef Gmelch and rejected by Jacques Froger – is also fractionally lower than the punctum indicating h (=a). Finn Egeland Hansen transcribes in g. Egeland Hansen 1974, 90. In the critical apparatus (562) Hansen refers to the correction (g, CR, LE) without indicating what has been corrected. I interpret the correction differently, i.e. as a special sign for ∂b^{b}-partly written over the previously notated g.

(written as a microtonal inflection on d!). Sharps – connoted with the rejected chromatic genus – were no longer allowed in Mass, according to my interpretation).

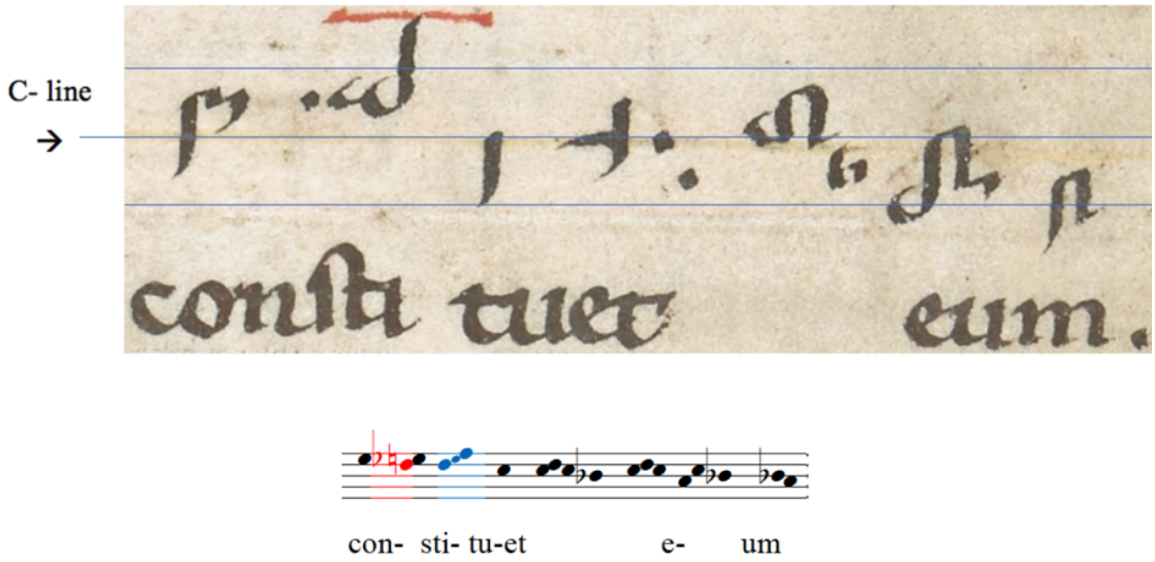


Fig. IV.12. Sta 195v *Beatus servus*, *constituet*.

In his article 'The "Unwritten" and "Written Transmission" of Medieval Chant and the Start-up of Musical Notation' of 1992, Leo Treitler describes the "veil of otherness" that the musicologist faces when studying medieval notation. He underlined that "[…] unlearning and *forgetting*" an established performance tradition is something completely other than just replacing chant books.[378] In the communities where liturgical chant was practised, chant repertories were considered to be mnemonic monuments, resulting from generations' hard work. Changes to this monument were usually avoided: monasterial *consuetudines* were reformed on a more or less regular basis but local performance practices were left untouched.[379] And if changes were imposed top-down, resistance sometimes resulted in casualties.[380] What has been observed above in *Beatus servus* could

[378] Treitler 1992, 131f.

[379] Cf. Klugseder 2008, 24.

[380] Glastonbury (Somerset) 1083, where the (Breton) abbot tried to impose "French chant" attributed to William de Fécamp, alias Guillaume de Volpiano. The monks resisted; the result: two dead and fourteen wounded, according to Symeon of Durham's Historia Regum (c1129).

be interpreted as a written echo of the sounding melodic figures containing $F^{\#}$s and $C^{\#}$s, as experienced in the *Scolica Enchiriadis* versions of this communion.

Interpreting the presence of encoded signal vehicles possibly wrapped in tonal area shifts and modal shifts is complicated. The material analysed in the present study is only indicative. In each case, it is to be tested whether the assumedly underlying non-diatonic semitones or the tonal area shifts as such (resulting in modal shifts or not) had a rhetorical function, which had gone astray by the time the diatonic modes provided a prescriptive melodic template for chant.

IV.5.2. Liquescent Notes

In comparison to the preceding alterations, the interpretation of liquescent notes as musemes is relatively straightforward. In this case, the museme is an addition to the existing modal melodic structure without altering any diatonic or modal aspects. Dirk van Betteray's analysis of liquescent notes in fourteen medieval Sankt Gallen manuscripts with chants for Mass indicates that consonants only explain the *position* of the intended instruction. The notational signal is: "sing this consonant as a sounding pitch"; however, as Van Betteray observes, position does not explain the *occurrence* of the liquescent note, as the same string of consonants in identical melodic situations does not necessarily lead to applying this museme.[381]

In comprehensive appendices, Van Betteray demonstrates that the *auctor's* rhetorical textual annotations trigger the melodic variant wrapped in the liquescent performance. Van Betteray struggles with the facultative employment of liquescent notes. It would be interesting for Van Betteray's findings to test the assumptions as presented in the present thesis. The first question would be whether other traditions (beyond Sankt Gallen) apply liquescens with the same functional background in different positions; the observed compound neume containing a liquescens as in Sta, *Beatus servus*, discussed above, might be a confirmative indication. Second, one could ask whether there are indications wherein the *auctor* chooses not to insert a liquescent note due to the risk of rhetorical overkill.

[381] Van Betteray 2007, 120.

IV.5.3 Stacked Musemes

Stacked musemes, like the combination of microtonal inflections and emphatic phrases, occur regularly. Again, I refer to the combination of a microtonal inflection and a liquescent addition applied in *Beatus servus* in Sta. Another good example is the Introit *Dum medium silentium*, where the occurrence of a microtonal inflection coincides with the start of a shift in the tonal area, its base shifting from *fa* to *sol* (see *ex.* II.10 and *fig.* IV.13 below). As argued in APPENDIX VIII, in this introit the microtonal inflection on *tenerent* exegetically refers to the return of Christ for the final judgement, linked to the slaughter of the Egyptian first-borns in the Old Testament. A theological instruction for the young monks of the Stavelot Abbey, dated as early as *c*685, refers to this eschatological context already. It can be strongly doubted whether there is a functional relation between the two musemes in the sense that the shift in the tonal area would *depend* upon the microtonal inflection or vice versa. I see two alternative explanations.

The first would be that it is an example of a tradition allowing for the superposition of musemes, here a shift in the tonal area and the microtonal inflection.[382] In that case, there is a paradigmatic employment of accentuation techniques, intended by the *auctor* and perceived as such by the audience. On the level of compound neumes, the same can be observed if a quilisma is combined with a microtonal inflection at the end, as frequently is the case in Ult1 and Ult2. The alternative explanation would be the ignorance of the workings of certain formulaic tools, lost in transition from an older formulaic context to a younger setting. The latter interpretation would confirm the observations regarding the emphatic phrases in the second-mode tractus repertory.

The preliminary conclusion about stacked musemes seems to be that as far as both musemes are distinct *sonic* phenomena, a synchronic paradigmatic employment aimed at and perceived by the same audience was perhaps intended. It seems as though the microtonal inflection combined with a liquescent note as employed in Sta (*Beatus servus*) above was intended as such. More complicated is the interpretation of paradigmatic signals of which one or more are not perceivable as distinct sounds but predominantly as formal variants, *e.g.* the combination of microtonal pitches in combination with emphatic phrases

[382] In this respect, an interesting terminology comes from the canzone tradition in Italy during the thirteenth century. A regular canzone strophe is bipartite, the first part called fronte, the second part sirma. The two parts have different harmonies; the moment of transition is called diesis. Cf. Kleinhenz 2004, 560.

or tonal area shifts. If the active / passive interpreters do not have the required level of training in perceiving the latter category, the auctor's rhetorical intentions go unnoticed.

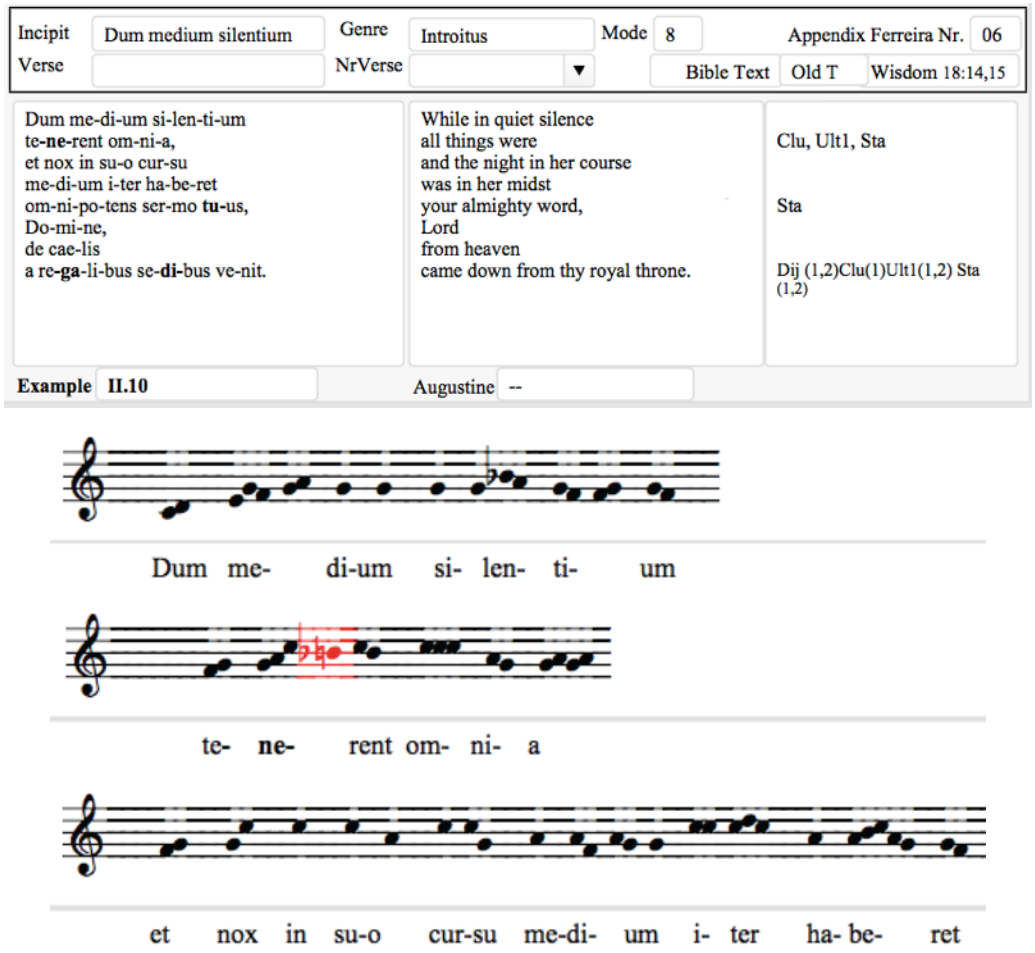


Fig. IV.13. *Dum medium silentium*, transcription from Ult2, 22r, Sta 45r identical.

IV.6. Musemes and Transmission

For all of the chants analysed above, a hypothetical construct gradually emerges from an older repertory consisting of a necessarily austere and diatonic, formula-related core surrounded by a system of formulaic musemes, functional via othernesses. These "othernesses" can only exist in relation to standards or formulas. It is on formulas that Hucke concentrates in order to explain transmission models. Hucke assumes the existence of a Roman performance practice with sets of formulas to which melismas may be inserted. "[T]he rest is a kind of florid recitation, which may be now simpler, now more

melismatic."[383] "The rest" however partly consisted of sets of encoded signal-vehicles, in other words sets of formulaically organised musemes, melodically supporting and annotating verbal texts. As a reminder: 'formulaic' means that in an environment characterised by melodic formulas, certain elements trigger variant formulas, which, in the circumstances described in this thesis, may refer to rhetorical meanings.

In the previous paragraphs, five musemes for accentuating text were presented; here I will regroup them before connecting them to concepts of transmission. The diagram in *fig.* IV.14 has two axes: the distinction between diatonic and non-diatonic musemes on the one hand and acoustic versus formal musemes on the other hand. The first division is absolute, the latter is a gliding scale.

	Acoustic →		Formal
Non-diatonic	Microtonal Inflections	Non-diatonic Semitones	
Diatonic	Liquescent Notes	Tonal Area Shifts	Emphatic Phrases

Fig. IV.14. Musemes categorised.

All museme categories are formulaic in the sense that they are triggered by rhetorical intentions of the *auctor*. Rhetoric is seen as the catalyst element in these formulaic processes because without its framework, chances are dim that the audience would understand the *auctor's* interpretations quickly enough when sung. The distinction between the non-diatonic signals refers to microtonal inflections on the one hand and to the non-diatonic semitones according to *Scolica Enchiriadis* on the other. These semitones at certain stages may have caused confusion, leading to wrong associative interpretations and shifting them downwards towards the related category of tonal area shifts, later perceived as modal shifts. For this reason, they were put in the middle of the gliding scale in the figure above. Within the diatonic category, a possible distinction lies between pitch additions and melodic alterations. Liquescent notes are pitch accentuations added to consonants in 'standard' melodic lines; emphatic phrases are formula variants.[384]

Both are employed in line with the characteristics of one mode. Shifts in tonal areas may refer to modal shifts. Tonal area shifts become perceivable as modal shifts when they

[383] Hucke 1980, 453.

[384] Within a formulaic context, for sure.

cross modally defined boundaries (ambitus) or positions (final, tenor, semitones). Based upon what Hucke and Huglo observed about the absence of modes as systemisers in the older traditions on the one hand and the Frankish modal principles on the other, one might assume that tonal area shifts causing modal shifts indicate the presence of an underlying museme. But, as stated above, the interpretation of both kinds of shifts is complicated. They may change the modus of the chant somewhere in its course, or one chant may have more than one modal shift. Each shift may represent a museme as such, a later correction of a non-diatonic semitonal museme, or a mistake. Moving further to the right in the diagram, the emphatic phrases as observed by Hornby are the final museme category. Within a diatonic context, they can be interpreted as variant melodic formulas without modal alterations or crossings in a formula environment. They were perceptible to *aficionados* of the genre during the earlier phases of transmission.

In the opening sentence of this paragraph, I referred to a hypothetical repertory consisting of a necessarily austere and diatonic, formula-based core surrounded by a system of melodic formulaic variants: othernesses. 'Necessarily' was added because the formulaic tools creating otherness can only underline their otherness against a *core* concept with these qualities. If the core concept itself would not be austere and diatonic but would allow for all kinds of variants in essence representing melodic embellishments, not only the rhetorical symbiosis but also the transmission of the 'core values' would be in danger. It might even be assumed that the melodic core content of melodies (apart from formulaic additions of any kind) was performed *without* melodic embellishments. The references by Johannes Diaconus to the Roman performance of liturgical chants as though they were curling hair strands would have referred to the formulaic *additions*, not to their 'core qualities'. Frequently adding 'curls' to the core melody without rhetorical implications would have distorted the whole underlying concept.

In the previous paragraphs, several cases of stacked musemes were observed: microtonal inflections in emphatic phrases, microtones where shifts in tonal areas occur, non-diatonic semitones 'covered' by modal shifts, and microtonal inflections replacing previous non-diatonic semitones. Hypothesising, the stacked musemes represent diachronically and geographically overlapping layers in transmission. While the overlaps may have had considerable differences per genre, evaluating these differences is beyond the scope of this exploratory study.

The texts and the rituals of the Roman liturgical tradition were transmitted to the north in writing. In contrast, the transmission of the melodic traditions that were connected

with them was problematic: notation did not yet exist and the musical cultures in many respects were most probably quite different. Johannes Diaconus represents the Roman point of view about the transmission when he complains that "the barbarian savageness (of the Franks, LL) was coupled with vocal crudeness, and they were unable to execute the technicalities."[385]

Karp underlines Johannes's wording: it refers to the *manner* in which the Franks sang, not to the altered pitches; Johannes Diaconus alludes to this without rejecting it.[386] Karp assumes that the Romans were more concerned about style, fluency, and nuance than about note-for-note accuracy. "Change was acceptable as long as it remained within the bounds of the proper style. The Romans viewed chant as a process and not as a product."[387] This might reflect the voice from a contemporaneous anonymous monk of Sankt Gallen who blames Roman cantors for misleading the Franks by disseminating different versions of chants in different locations. Perhaps this is an echo of variable formulaic performances, perceived as distinct formulas. As pointed out in Chapter III, Karl Gustav Fellerer already assumed in 1972 that this process was "[…] a tradition of Mediterranean improvisation and model-based [sung] liturgy." The Franks, according to Karp (referring to Hucke), had to learn a repertory with an idiom unknown to them. "Seeking to assimilate something foreign, they became concerned with questions of correctness", be it correctness according to the Frankish template.[388] In the context of the findings of this thesis, it could be assumed that superficially, the result sounded similar, yet its deeper understanding was fundamentally different.

Without being able to specify at this stage what was transmitted from Rome and how it became assimilated into the later traditions, scholars seem to agree that the Franks succeeded in transmitting large parts of the Roman liturgical chant in a recognisable way that must have varied from 'copies' to 'paraphrases'. The analysis of several stacked musemes might indicate that larger parts of the auditive, less-obvious, rhetoric-driven processes below the surface were no longer recognised by younger traditions. They became increasingly systemised by modal principles from the ninth century on. Melodic

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[385] Van Dijk 1963, 23f. There were at least four medieval historians with this name. Johannes Diaconus of Rome is referenced here, date of birth unknown, died before 882.

[386] Karp 1998, 33.

[387] Ibid.

[388] *Ibid.*, 34.

variants intended as musemes were learned as mere formulas but not recognised as having rhetorical importance. Connoting microtonal inflections with rhetoric in a diatonic context survived by their fixed links to a supersemitonal – recognisable diatonic – pitch. 'Wrong' semitones – in treatises interpreted as related to the chromatic genus – appear without a distinct audible connection to the diatonic frame and as such are confusing. They block the catalyst mechanisms and obstruct efficiently linking this non-diatonic element to rhetorical meanings in the text.

Driven by a formalistic approach in religious affairs, the Carolingian elite managed to codify major parts of the sung liturgy with notation. Some isolated notated fragments seem to date back as far as the first half of the ninth century. More notated manuscripts have been preserved from about 100-125 years after Charlemagne's death. Once codified, a number of musemes lost their encoding qualities and became fossilised as formulas that were disconnected from their formulaic origin. Increasingly, the formulas of the diatonic modal system took over. The formulaic system fell apart, lacking a comprehensive understanding of the guiding principle that formulaic alterations of diatonic melodies were triggered by rhetoric. Traditional performances not in line with modal schemes gradually became perceived as 'wrong', but custom kept them alive.

This impression is confirmed by, amongst others, an anonymous author known by the '*Petistis*' prologue to a (lost) Antiphonary written during the first half of the eleventh century. He opposed modal shifts on theoretical grounds, stating in the next sentence that he had to accept them due to custom.[389] The dramatic drop in both emphatic phrases and (less so) microtonal inflections in the younger, Carolingian tractus as notated in the six manuscripts selected for Mass might indicate that the insight into the expressive qualities of these variant phrases was waning or that the expressive tool was losing popularity at the time.

Emphatic phrases could wither away unnoticed, but chromatic pitches without rhetorical formulaic footing must have been the most disruptive. They could too easily be misinterpreted as 'wrong' diatonic semitones. The rejection of chromatic alterations is almost unanimous from the earliest known Carolingian treatises on.[390] In spite of these rejections, some local traditions, apparently aware of their rhetorical implications,

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[389] Cf. Zijlstra 1997, 114.

[390] In spite of these rejections, local traditions continued to employ semitonal alterations which seem to imply a chromatic origin; see the S-files in Ult2 above.

continued to employ semitonal alterations, theoretically backed by the principles of the *Scolica Enchiriadis*, similar to the alterations in the S-files in Ult2 above.

The enharmonic microtonal pitches found a wider acceptance because, due to their distinct sound, they were less confusing (and for transmission, less disruptive) than chromatic alterations and consequently, they survived longer. Until at least the middle of the thirteenth century, enharmonic microtonal inflections continued to be notated in relation to rhetorical accentuations. Ultimately, they also vanished as a consequence of their complicated performance and due to a lack of understanding plus the 'inappropriate' performance allowing *auctores* to apply microtonal inflections *ad libitum*. They were considered 'inappropriate' because, among other reasons, these *Fremdkörper* must have originated from a less formalistic southern performance tradition allowing *auctores* to decide when to apply accentuations. More research will be needed to propose a hypothesis concerning whether the melodic constraints apparent from the tractus analysed indeed hint at Roman principles or at later diatonic Carolingian guidelines. In a number of cases, not represented in the sample, the Dij tradition seems to have less strict links to the diatonic pitches.[391]

Finally, liquescent notes survived in the monophonic corpus as they fit into the modal construct without any problems. Predominantly perceived as embellishments, their rhetorical functions were lost in transmission and subsequently, this function remained hidden until recently.

In semiotic terms, the rhetorical functions of the acoustically less distinct musemes (shifts of tonal areas and emphatic phrases) were probably truncated already during earlier phases of intercultural transmission. Both non-diatonic musemes continued to be employed by *auctores* until at least the first half of the thirteenth century. Chronicles report their employment even later, culminating in the anonymous *Cantuariensis* text from the late thirteenth century, claiming rhetorical qualities for Greek genera in chant yet to be confirmed by further analysis, if ever.

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[391] Dij, via Guillaume de Volpiano, has been linked to the Cluny tradition, of which the sung liturgy is assumed to be of Northern French origin: Ferreira 1997, 146, 150. Joseph Gmelch, in *Die Viertelstonstufen im Messtonale von Montpellier* (Freiburg University, 1911), Chapter 5 lists occurrences of microtonal inflections disconnected from the diatonic system as described here. Is this a continuation of earlier (northern) practice or, on the contrary, a reflection of unawareness of a microtonal grammar?

Fig. IV.15 represents the essence of my hypotheses concerning musemes. Microtonal and chromatic inflections can be represented by *litterae significativae*, a tool that has only been briefly touched upon in my analyses. The assumed common background of these tools is highlighted in the diagram.

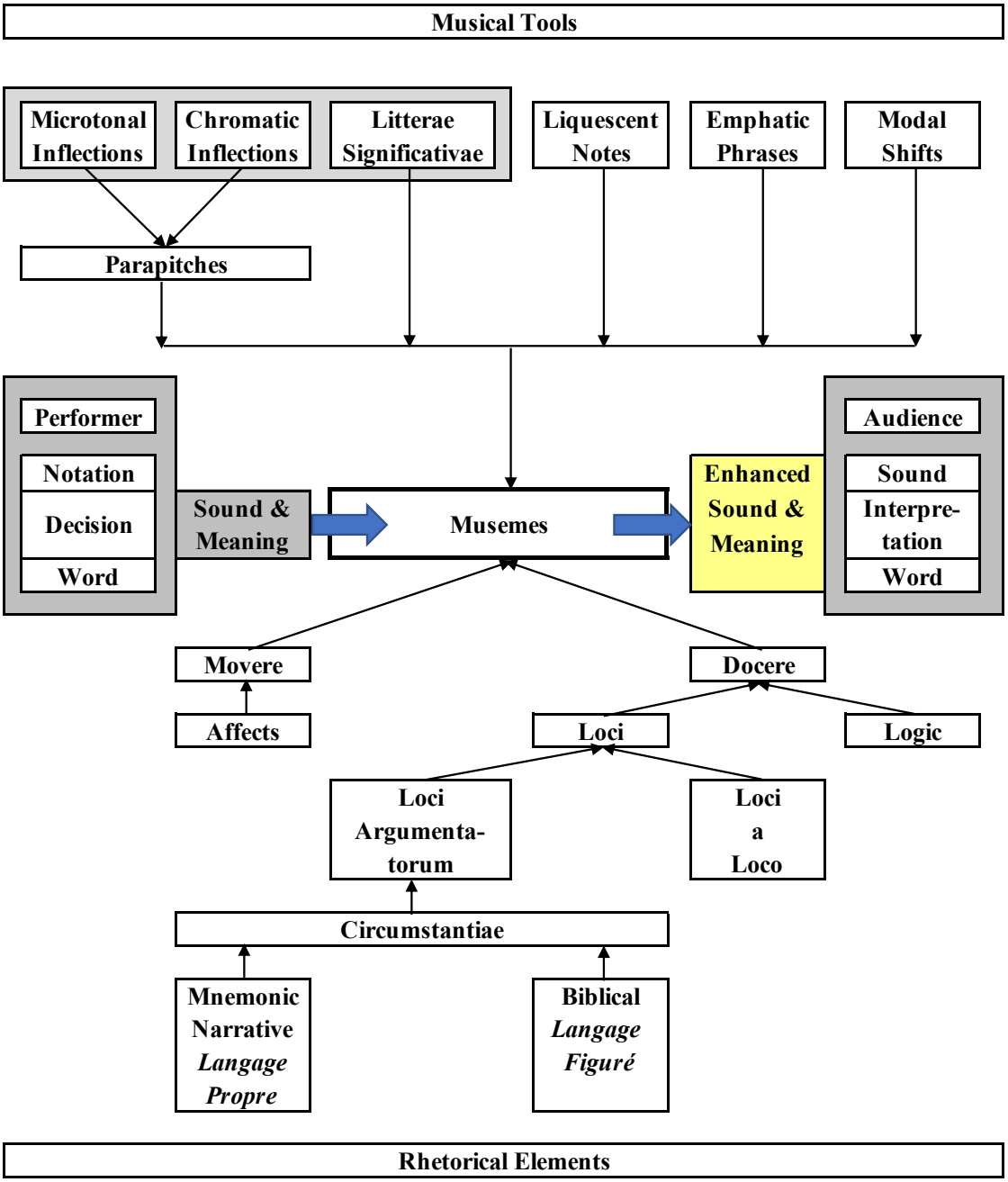

Fig. IV.15. Musemes: the linguistic elements and musical tools in Romano-Frankish chant.

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The distinctive rhetorical function of the parapitch is apparently backed by its own grammar. The comparative analysis carried out seems to indicate that *modulare recte* constrained the employment of microtonal inflections to an underlying prescriptive diatonic frame. The supersemitonal pitches to which the microtonal inflections are linked define the possibility of applying them or not. It was an offense against the grammar to shift a supersemitonal pitch in order to facilitate the employment of a parapitch for rhetorical effects. These findings apply at least to the repertory of the second-mode tractus in the Mass manuscripts consulted. Further research is needed to confirm this grammar for all liturgical genres.

Building on Hornby's analysis of emphatic phrases in the second-mode tractus, the comparative analysis was extended to the seemingly paradigmatic employment of two rhetorical tools: emphatic phrases and microtonal inflections. Comparing the parallel occurrences of emphatic phrases and microtonal inflections in the same tractus did not disclose any particular complementary connections or mutual exclusion. The results of a diachronic split of the repertory (older / Frankish repertory) might indicate that by the time the Carolingian scribes notated the diatonic melodies 'annotated' with microtonal inflections, the emphatic phrases had already become mere melodic formulas, whereas the latter still kept their formulaic functions.

The analytical diversion to the S-files as notated in the Antiphonary Ult2 also uncovered chants with (synchronic) 'double' rhetorical annotations by pitch accentuations, the second category being non-diatonic semitones. In a number of cases, both classes of non-diatonic pitches appear in the same chants. With the same rhetorical function, no other distinctive qualities could be observed, as the thirteenth-century anonymous Franciscan author of the prologue to a comment on the Song of Songs suggests. This is not the only source that refers to the chromatic genus, but for non-diatonic pitches, it is more probable that the underlying system reflects the principles mentioned in the *Scolica Enchiriadis.* Hypothesising, one may assume that with a lacking or diminishing comprehension of non-diatonic semitones, the variants were easily confounded with 'wrong' diatonic semitones, leading to contemporaneous irritation and confusion.

The considerations of the parallel occurrence of a complete toolbox of annotating musemes led to a hypothetical formulation of preceding oral transmission processes. It states that the notational paradigmatic occurrence of several musemes does not necessarily

imply their ‘understood’ performance. It rather reflects a co-existence of accentuation techniques developed in different periods and regions, some of which were no longer recognised as such during later periods.

CONCLUDING REMARKS

The rediscovery of manuscript Montpellier H159, with a notation that presumably represented microtones, caused much consternation amongst French scholars around the middle of the nineteenth century. Microtones, intervals smaller than the smallest interval in European main stream music – the semitone – were considered to be 'oriental' or 'Arabic', which *de facto* meant 'inferior'. It was considered impossible that 'the foundation of Western music', Romano-Frankish chant, could contain these 'inferior' pitches. The academic discourse about the subject got bogged down when, after 1903, scholars with a clerical background withdrew from the discussion, possibly due to the Vatican's preference for analyses that supported community singing; quartertones did not fit into that concept.

In 1978, Dom Jacques Froger from the Benedictine Solesmes Abbey wrote an article that clearly intended to stop the discussion about microtones once and for all. Implicitly acknowledging a distinguishable sonic property of the H 159 symbols, he unsuccessfully tried to attach another meaning to them. Ike de Loos and Manuel Pedro Ferreira in their doctoral theses again addressed the subject from a supportive angle in 1996 and 1997 respectively, but there was little to no resonance to their opinions. Andreas Pfisterer, in one of the few substantive responses to Ferreira's research, acknowledges the occurrence of microtonal inflections, but is inclined to consider microtonal inflections as local intonation peculiarities, not as a quality inherent to the Romano-Frankish chant tradition as we know it or its (Roman?) predecessor. He cannot agree with the scope of the phenomenon as assumed by Ferreira because he considers the number of manuscripts consulted to be insufficient for developing theories. As demonstrated by additional evidence from amongst Christian Meyer's study about the practical impact of monochord instructions and the calculations of microtonal intervals in instructions written all over north-western Europe on the one hand and by the numerous references to the reception of microtones in chronicles and treatises over a period that covers centuries on the other hand, Pfisterer's reservations can be put aside without concern.

Now, exactly forty years after Froger's publication, the new insights that have developed since then not only seem to make the palaeographical rejection of a medieval liturgical microtonal performance tradition untenable, but also add crucial understanding

about functional links between text and melody that reflect a sophisticated microtonal performance tradition far beyond concepts of embellishment or word painting.

Michel Huglo and Ferreira sketch Roman chant as a western outpost of Hellenistic traditions. In the context of a Latin, Roman tradition, the enharmonic genus was mentioned by Aristides Quintilianus; later, Boethius's treatises transferred it to the Carolingians, where during the ninth century, Pseudo-Remigius of Auxerre refers to this genus as a Roman performance tradition. Chronicles continue mentioning the performance of microtonal inflections until the end of the fifteenth century.

To investigate *why* microtonal inflections were employed never occurred to the scholars who acknowledged them. Answers to why a musical figure is employed require functional analysis. It was Jacques Froger who sought for functional answers in 1978. His functional analysis failed for two reasons. Firstly, because he concentrated on a strictly musical context. Secondly, because the phenomenon does not reflect the formal, melodic system of the Romano-Frankish tradition. Its employment to a certain extent indeed depends upon "whether the scribe feels like it", as a scholar quoted by Froger correctly remarks.

The analysis in the present PhD thesis indicates that microtonal inflections are triggered by the meaning of words and / or expressions; the melodic accentuation contributes to the rhetorical qualities of the texts sung. Via rhetorical channels, the microtonal signal-vehicles address *movere et docere* by highlighting words related to affect, logic, and *loci*. In addition, my research contextualises the functionalities of a range of melodic musemes in medieval chant. The combination of melodic meanings and text elements created new multi-levelled rhizomes that called for an adapted nomenclature, which is based upon semiotic terminologies. Central semiotic concepts are 'museme', 'indexical signal-vehicle', and 'parapitch'. A museme is a formulaic unit of musical meaning in a given (here liturgical) context. The microtonal museme as an indexical signal-vehicle, *by definition* ('indexical'), addresses *references* to meanings in the chain of events between writing, reading, performing, and hearing formulaic units. In these contexts, I define the microtonal inflection as a parapitch, a pitch that by definition carries both melodic and textual properties.

The results of my analyses will hopefully contribute to the discourse about the restitution of a melodic tradition by an improved understanding of comparative dating between older and younger traditions based upon an increased awareness of the intricacies of the widespread rhetorical and formulaic tradition which seems to have been gradually

disintegrating since its earliest notations discovered thus far. By acknowledging non-diatonic elements in the restitution of Romano-Frankish chant and successively stepping over the Guidonian threshold of diatonic modality, it could considerably shift the chronological horizon for reasoned restitutions.

The otherness of the microtonal pitch in a diatonic environment is an auditive experience that directs the attention of the audience towards the word in which this otherness is applied. Rhetorical principles and guidelines catalyse the communication intended between the scribe, the performer, and the audience. If opponents of the microtonal interpretation of special signs and adapted neumes maintain their rejective stance, they will have to oppose the palaeographical and historical arguments presented in Chapter I, which revaluate previous research. In addition, they will have to introduce alternative distinctive sonic qualities for the special signs and adapted neumes that match the effect of microtonal inflections in the context presented here.

Additional explorations seem to indicate that against the same background of otherness, a number of musemes had the same function: non-diatonic semitones, emphatic phrases, modal shifts, and liquescent notes. Results shown in APPENDIX VI that link Ult2 with the tenth-century manuscripts Sankt Gallen SG 390 and SG 391 strongly suggest that *litterae significativae* other than the letter 's' in Ult2 are bearers of the same semiotic tradition. The common denominator of all musemes, formulaicy, is a compound concept, both consisting of 'standard' properties of a core repertory against which notions of otherness apply contrasts and connecting the melody to verbal meaning.

Formulaicy, as defined by Leo Treitler in his *With Voice and Pen* and applied amongst others by Rebecca Maloy in her book *Inside the Offertory*, refers to a system with *conditioned* formulas. Both authors relate the system to genres characterised by systematic constraints of (diatonic) melodies or phrases. The functionality of musemes widens the concept of formulaicy not only to word-pitch relations, but also to both formulaic and non-formulaic chants. For instance, microtonal inflections occur in all Mass genres and (based upon the sample in this study) there are no indications that non-diatonic semitones as observed in Ult2 would behave differently in this respect. Other formulaic musemes, such as emphatic phrases, function only in a formulaic genre, as the otherness of this melodic museme is not defined by pitch, but rather by variant phrasing, which only creates contrasts in a formulaic setting.

Treitler and Maloy explain the employment of formulaic systems by their structuring qualities for learning the repertory and transmitting it according to the

traditions from previous generations. However, in the contexts analysed, musemes represent aspects of what I would call 'contained improvisation'. This expression is applicable here for two reasons: the *auctor* may choose to apply a museme or not, which is an element of individual choice. For performers, it can be typified as improvisational. The second reason is that 'contained' refers to the strictly defined formal and rhetorical conditions under which they can be employed. Demarcations of otherness are formally strictly defined; in addition, musemes can semiotically be categorised as indexical signal-vehicles, *by definition* referring to some content, further specified in the verbal text and in the actual liturgical context. When the trained audience perceived the museme's otherness, it *knew* that a rhetorical annotation was implied. Rhetoric was the catalyst of the implied communicative process and was needed to convey meanings and codes.

As far as musemes have a diatonic background (all except the microtonal inflection and the non-diatonic semitone), hypothesising in the Carolingian religious context, which stressed formalistic issues, they presumably soon blended unobtrusively as formulas into the diatonic main frame. The disappearance of emphatic phrases in younger Carolingian tractus compositions may be a general indication for the reduced formulaic reception of diatonic musemes at the time. In semiotic terms, the codes implied by the indexical signal-vehicles indicating the presence of rhetorically important text elements were lost. Without its rhetorical footing, the closed semiotic circuit – in which encoded musemes as indexical signal-vehicles were passed from the scribe to the performer and from the latter to the audience – was disrupted. What remained of the emphatic diatonic phrases were formulas to be learned by heart but without the same meanings that they had previously contained. Microtonal inflections, audibly more distinct than diatonic emphatic phrases, continued to be employed, be it at a reduced rate in comparison to the older tractus. This diachronic interpretation implicitly assumes that the written sources reflect that the younger tradition, predominantly motivated by formalistic considerations, copied the microtonal inflections from the older tradition and assimilated the microtonal musemes in their idiom as an intrinsic part of their culture, but that they employed the technique less frequently. At the present state of analysis, it is unclear whether 'younger' and 'older' can be substituted with 'Carolingian' and 'Roman' respectively.

The same diachronic loss of rhetorical meaning seems to apply to a number of modal shifts, two of which were analysed in more detail. Prior to the emergence of modal systems, introduced by the Carolingians, shifts in tetrachordial diatonic tonal areas as such may have been formulaic musemes. The example *Dum medium silentium* would refer to

such a shift, coinciding with a microtonal inflection as a 'stacked' museme. I explained the coincidental occurrence of the stacked musemes by the disrupted semiotic circuit of the diatonic modal museme against a continued perception of the microtonal museme. The other example, the modal shift in the communion *Beatus servus*, has a more complicated background. The explanation assumes an underlying tonal construct as reflected in the *Scolica Enchiriadis*, which allows for a number of semitonal alterations. The analysis by Charles Atkinson reveals the non-diatonic semitones avoided by the corrective intentions of the *auctor*. The latter modal shifts were inserted in order to avoid the semitones that did not fit in the diatonic notation. An analysis of these non-diatonic semitones, only now perceived as parapitches, reveals their museme-character, as they seem to confirm a rhetorical intention when related to the text in which these pitches are applied. As an echo of the former non-diatonic semitones, microtonal inflections appear as replacements for the non-diatonic semitones in some manuscripts. The confusing employment of 'wrong' semitones in diatonic chant may have been the cause for the earlier and almost unanimous rejection of this practice. Dirk van Betteray demonstrated the rhetorical background of liquescent notes, which as short diatonic additions to the melody could be applied without further problems when pronouncing consonants.

On the one hand, the museme formulaicy is conditioned by text, rhetoric, and personal interpretation. Avoiding overkill is an often-quoted rhetorical guideline and limits the possibilities of the *auctor* applying musemes. These elements define whether the museme as written or performed contributed to *modulare bene*. On the other hand, when applying microtonal inflections, an *auctor* has to also respect musical constraints if the findings of the second-mode tractus analysis are representative for all employments of the microtonal inflection. The constraints, again, seem to underline the formulaicy as otherness in relation to a diatonic framework. It apparently belonged to the rules of *modulare recte*, employing microtonal inflections only if immediately preceded by a supersemitonal pitch: *fa*, *do,* or B^b. Diverging variants were observed in Dijon chants apart from the samples, although they were not further investigated here.

Returning to *modulare bene*: this most probably also referred to the actual performance – in rhetorical terms the *pronuntiatio,* the delivery – of both the core repertory and formulaic additions. Taking into consideration that microtonal inflections reflect narrow intervals, I assume that they were only perceivable if the performance of the remaining phrases reflected an austere style, *sine fuco*, as Augustine remarked, referring to rhetoric in liturgy. This is again in contradiction with many current interpretations of

ancient music, which seem to prefer adding endless melismas and oriental sounding embellishments. It further decreases the chances of hearing this style of chant being performed again. Those chances are already dim due to the melodic, linguistic, and biblical knowledge required to perceive the sophisticated performance tradition as put on parchment by a medieval *auctor* a thousand years ago. He indeed could rely upon the fact that his audience would understand the intended combined effects of all of these elements.

SAMENVATTING

De interpretatie van speciale tekens als weergave van microtonen ("microtonale inflecties") in een middeleeuws liturgisch manuscript, het Tonarium Montpellier H 159 (Dijon, *c*1030), leidde vanaf 1854 tot verhitte debatten tussen – aanvankelijk voornamelijk Franse – musicologen. Velen achtten het uitgesloten dat klanken – die in West-Europa vooral werden (en worden) geassocieerd met Arabische culturen – zouden hebben geklonken tijdens middeleeuwse liturgische vieringen. De discussie over de interpretatie van die tekens duurde voort tot in de tweede helft van de twintigste eeuw. Belangrijke bijdragen aan de discussie werden geleverd door een artikel van Jacques Froger en de proefschriften van respectievelijk Ike de Loos (Utrecht 1996) en Manuel Pedro Ferreira (Princeton 1997). Inhoudelijk kwam de discussie vanaf 1854 niet veel verder in al die jaren. Wel werd geleidelijk duidelijk dat de omstreden tekens en hun equivalenten in veel meer manuscripten voorkwamen dan aanvankelijk gedacht. In de onderzoekspraktijk bleef het echter een randverschijnsel. Of ze nu wel of niet als kwarttonen werden geïnterpreteerd: wat moest je er eigenlijk mee?

Het onderzoek voor dit proefschrift begon vanuit de invalshoek dat er een muzikale functionaliteit was voor deze speciale tonen. Het bouwde voort op de aanpak van Jacques Froger uit 1978. Mijn onderzoek ging in eerste instantie uit van de premisse dat het gebruik van microtonale inflecties kan worden verklaard vanuit een muzikaal systeem. Froger had dat eerder ook geprobeerd, maar zonder succes. Toen dat ook mij niet bleek te lukken, begon ik te zoeken naar mogelijke functionele verbanden tussen microtonale inflecties en tekst. Die insteek had meer succes. Microtonale intervallen bleken een onderdeel te zijn van een vrij ingewikkelde retorische systematiek om de betekenis van woorden in de teksten van de gezongen liturgie te onderstrepen. De microtonale inflectie is een opvallende toon in Gregoriaanse gezangen die vooral uit hele tonen en een enkele halve toon bestaan. In dit proefschrift wordt in eerste instantie aandacht besteed aan de microtonale inflecties zoals genoteerd in zes manuscripten met gezangen voor de mis, geschreven tussen circa 1030 en 1225. Het zuidelijkste manuscript werd geschreven in Cluny, het noordelijkste manuscript stamt uit Utrecht. Een steekproef uit deze handschriften van 343 microtonale inflecties in alle gezongen genres van de Mis bevestigde de aanvankelijk gebleken contexten van het verschijnsel waarnemingen zonder

uitzondering. Een verkennend onderzoek naar het gebruik van microtonale inflecties en niet-diatonale semitonen zoals genoteerd in het Utrechtse antifonarium U 406 bevestigde het retorische gebruik van beide niet-diatonische toonvarianten voor het Officie.
Een opvallende karakteristiek van de microtonale uitvoeringstraditie blijkt te zijn dat het de uitvoerder vrijstaat om – vanuit retorisch oogpunt – een microtonale inflectie toe te passen of niet. Er is dus een zeker improvisatie-element aanwezig.

Tijdens de behandeling van de *status quaestionis* en het erop volgende onderzoek (Hoofdstuk II) bleek dat de musicologische terminologie niet is toegesneden op een exacte beschrijving van wat er zich tussen muziek en tekst en tussen manuscript – uitvoerder – toehoorders afspeelt. In Hoofdstuk III is daarom aandacht besteed aan een semiotische verwoording van die communicatieve processen. Geconstateerd werd dat *sémiologie grégorienne*, een begrip geïntroduceerd in de zestiger jaren, de lading niet dekt die het woord semiologie suggereert: het is een geëvolueerde vorm van muzikale paleografie. Om te komen tot een betere beschrijving werden daarom begrippen uit publicaties van Charles Saunders Peirce, Umberto Eco, Eero Tarasti en Philip Tagg toegepast op hetgeen in de twee eerste hoofdstukken werd geobserveerd. Vastgesteld kon worden dat de microtonale inflectie geen volwaardig semiotisch teken-vehikel (*sign-vehicle*) is, maar een indexicaal signaal-vehikel (*signal*-vehicle), dat zelf geen inhoud heeft maar wel *systematisch verwijst* naar een retorisch belangrijke uitdrukking in de verbale tekst. Omdat de microtonale inflectie *altijd* een retorische referentie betreft, werd het door Peirce geïntroduceerde begrip 'indexicaal' toegevoegd. Het staat ergens tussen melodie- en tekstvelden in en wordt derhalve door mij als 'paratoon' gekarakteriseerd (*parapitch*). Een paratoon is een 'museme', een muzikale eenheid met een communicatieve betekenis. Hoe de gecodeerde informatie van de paratoon vanaf het manuscript via de uitvoerder bij de toehoorders terecht komt (of niet) wordt besproken aan de hand van een typologie van communicatiepatronen die de relaties tussen inhoud en informatiedragers en -ontvangers specificeert.

Vervolgens werden in Hoofdstuk IV in de zes bronnen van de Mis alle daarin genoteerde microtonale inflecties in de tractus van de tweede modus onderzocht (221 casussen). De eerste conclusie uit dit genre-onderzoek was dat er een muzikale grammatica geldt voor de correcte toepassing van microtonale inflecties. Daarmee krijgt het grammaticaal getinte begrip *modulare recte* een directe toepassing in de uitvoering van microtonale inflecties. De opzet van het tractusonderzoek sluit aan op een publicatie van de Engelse musicologe Emma Hornby uit 2009. Daarin stelde zij vast dat afwijkingen van

de vaste muzikale frasen die dit genre kenmerken kunnen worden verklaard als retorische onderstrepingen van bijbelcommentaren (in *emphatic phrases*). Er bleek geen duidelijk verband te bestaan tussen de toepassing van deze (diatonische!) *emphatic phrases* en microtonale inflecties: soms overlappen de paratonen en de *emphatic phrases* elkaar, dan weer komen ze apart voor. Uit een diachronische analyse bleek dat de *emphatic phrases* in jongere Karolingische tractus niet meer voorkomen, in tegenstelling tot microtonale inflecties. De hypothetische conclusie luidde dat bij de assimilatie van de oudere tractus in de Karolingische zangcultuur de vorm (afwijkende formules) wel is overgekomen, maar dat daarbij de retorische vingerwijzing verloren is gegaan. Dat was een zodanig interessante conclusie dat de diachronische verschuivingen van andere recentelijk eveneens als annotatietechnieken gekarakteriseerde verschijnselen (musemes dus) werden onderzocht: liquescente tonen en modale verschuivingen. Aan de hand van vijf van deze musemes (microtonale inflecties, niet-diatonale halve tonen, *emphatic phrases*, modale verschuivingen en liquescente tonen) en hun al dan niet geconstateerde overlappingen is hypothetisch geanalyseerd welke verschuivingen er tussen de karakteristieken van de oudere tradities en de jongere zangtradities kunnen hebben plaatsgevonden. Of ‘oudere’ en ‘jongere’ kunnen worden vervangen door respectievelijk ‘Romeinse’ en Karolingische’ kan bij de huidige stand van kennis niet worden bevestigd.

De voorlopige uitkomst van deze vergelijkingen lijkt te wijzen op een oudere traditie die werd gekenmerkt door een strikt diatonisch opgezet kernrepertoire, waaromheen een aantal contrasterende diatonische (modale verschuivingen, *emphatic phrases,* liquescente tonen) en niet-diatonische (microtonale inflecties, niet-diatonale alteraties) musemen. Deze musemen werden *uitsluitend* toegepast om retorische tekstannotaties aan te brengen. De ’oppervlakte’ van dit repertoire werd grotendeels geassimileerd in de Romano-Frankische gezongen liturgie maar de retorische verwijzingen vervat in de minder opvallende diatonische musemen gingen relatief snel verloren. Wél hoorbare niet-diatonische restanten verdwenen geleidelijk na de invoering van de notenbalk in de elfde eeuw en het daarbij behorende rigide diatonische toonsysteem.

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