Thinking through the guitar : the sound-cell-texture chain

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The sound-cell-texture chain

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Dit proefschrift is geschreven als een gedeeltelijke vervulling van de vereisten voor het doctoraatsprogramma docARTES. De overblijvende vereiste bestaat uit een demonstratie van de onderzoeksresultaten in de vorm van een artistieke presentatie.

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Introduction

Central Aim

The central aim of this artistic research project is to establish and develop guidelines for the way scoring for the classical guitar can be used as a vehicle for musical thought, and to use these findings to write new music for the classical guitar.

Framework and background

"The guitar is a miniature orchestra in itself!"[1] Yet, writing music for the guitar is a daunting task. Composers need to find a balance between the specific possibilities and limitations that the guitar poses, and at the same time use it as a means of artistic expression. In my experience as a performing guitarist, regularly receiving scores from composers and studying repertoire from well-known non-guitarist composers, I often notice scoring imprecisions as well as misinterpretations of the nature and conditions of the classical guitar potential. With such a well-established instrument as the classical guitar one would expect that there is common knowledge among composers of how to score for the guitar. But even in compositions of well-known composers, lack of understanding of the instrument is often evidenced by unplayable or impossible passages.[2] This may be caused by a general lack of familiarity in the composition world with the classical guitar and its scoring potential when compared to, for instance, the piano and string instruments with their long standing scoring traditions. This situation seems persistent, certainly in part because there are few studies explicitly dedicated to the topic of classical guitar scoring, that all leave a range of voids in their description of the guitar potential.[3] Two general orchestration guides that contain a chapter on guitar scoring, the Study of Orchestration by Samuel Adler and Instrumentation and Orchestration by Alfred Blatter, contain obvious mistakes and oversights in their

[1] This quote is often attributed to Beethoven, although no record exists of when and where he expressed this idea. A search on Google revealed that different websites attribute the quote to different musicians such as Beethoven, Mozart, Villa-Lobos, Segovia and Berlioz; it seems that the quote is apocryphal. There is, however, a history of guitarists and composers comparing the guitar to an orchestra. Fernando Sor made explicit connections between the guitar and orchestral instruments in his *Methode pour la Guitarre /Guitarre Schule* (Sor, 1831, pp. 15-19), explaining different ways of imitating the sound of orchestral instruments such as the horn, trumpet, the oboe and the harp. Andres Segovia is said to have described the guitar as "an orchestra seen through the wrong end of a telescope".

[2] Examples are unplayable guitar chords in Alban Berg's *Wozzeck* (Act II, Garden of an Inn. Quoted in Marriott (Marriott, 1984, pp. 30-34)). The published version of Rodrigo's *Invocacion y Danza* is an edited version by Pepe Romero (Rodrigo, 1997) full of *ossia* solutions proposed by the editor in the arpeggiated chord section.

[3] Publications that are specifically dedicated to the subject of scoring for the guitar are: *Composer's Desk Reference for the Classic Guitar* (Kachian, 2006), *La Grammatica della Chitarra* (Gilardino, 1994) and *How to write for the guitar* (Bream, 1957). The voids these publications leave in the description of the guitar potential are discussed in depth in the Theory Chapter.

discussion of the guitar.[4] With the lack of scoring literature, guitarists report personally informing composers on the possibilities of the instruments by making fretboard mock ups and neck charts (Musicians.com, 2010; Tosone, 2000, p. 27), making concise overviews on the possibilities of the instrument (Bream, 1957), while others report having to do extensive editing after receiving scores, even when composed by established composers as Kernis and Ponce (Tosone, 2000, p. 10; Segovia, 1989).

Research questions

The main question directing this research is: How can scoring for the classical guitar be analyzed and improved as a means to capture the possibilities of the guitar in artistic creations and expressions of the composer?

Sub-questions are:

1. What are the historical origins of the problematic relationship between guitar, guitarist and composer?
2. What are the possibilities and characteristics of the classical guitar (e.g. range, sonority, harmony) and what are the (extended) techniques available to utilize them (e.g. tremolo, arpeggio, percussion, alternate tunings)?
3. What are the theories, methods and techniques on scoring for the classical guitar in terms of
    a. Instrumentation
    b. Writing style (e.g. single line, polyphonic, melody and accompaniment) and
    c. Nature of scores (e.g. desirable ranges, positions, tonal choices)?
4. How can analysis of scoring evidenced in historical and contemporary guitar repertoire be helpful in establishing guidelines for the scoring potential of the guitar?
5. What notation practices do we find in guitar scores, and how can these notation practices be improved so that they present clear and unambiguous instructions to the performer?
6. How can guitar scoring principles developed during the research trajectory be used to create new compositions in the form of works for solo guitar?

Delineation

In the current section, the focus of this study is discussed. Questions leading the discussion are: what repertoire is considered in this study? Which styles and epochs are relevant? What are the latest scoring developments captured in this study? Which aspects of compositions are focused on in particular? Does

[4] Adler, for instance, does not include any fingering charts of the fretboard and gives his literature example in bass clef (Adler, 1989, pp. 104-105) a clef that is not used for guitar notation. Blatter, in an appendix to a chapter on guitar instrumentation misrepresents the range of the first string by an octave in his fingering chart (Blatter, 1997, pp. 445-446). For a more thorough discussion of problematic issues in the previous studies, please refer to the Theory Chapter.

this study emphasize structural analysis of larger forms, or detailed attention for shorter passages? What is missing in the existing literature on guitar scoring?

The research deals with scoring for the solo classical guitar as evidenced in classical guitar repertoire. In order to do justice to its complexity, this study focuses exclusively on scoring for the solo classical guitar. Chamber music and electronic music are not included as research topics as they all involve other instruments, and are therefore not directly related to guitar scoring. However, this study is not without benefits for these fields: a thorough understanding of the workings of the solo guitar can be of use to those who write chamber music and electronic music involving the guitar.
This study intends to be inclusive of the wide range of styles and epochs that the classical guitar community so characteristically incorporates in its repertoire. For this reason, there is attention for guitar music from the classical and romantic era (e.g. Fernando Sor, Francisco Tárrega), early twentieth century repertoire (e.g. Manuel Maria Ponce, Heitor Villa-Lobos) and later twentieth century repertoire (e.g. Luciano Berio, Arthur Kampela, José María Sánchez-Verdú). Although compositions by avant-garde composers play an important part in this study, it was not my intention to focus completely and exclusively on the most recent developments in the world of experimental music. Nevertheless, I did set out to treat sounds and techniques more commonly found in experimentally-oriented works, such as scratching sounds and inverted stopping sounds, with the same attention for detail as more traditional sounds, which resulted in detailed accounts of the possibilities and conditions for their use.
The *Sequenza XI* by Luciano Berio (1988) is an important composition of the late twentieth century that, due to its effective use of a wide range of scoring tools, plays an important role in this study. However, it does not reflect the final stage of developments. Representative of some of the latest developments is the work of Arthur Kampela, receiving ample attention in this study. Kampela, a student of Brian Ferneyhough, effectively uses the guitar to build on the musical innovations explored by other avant-garde composers, who did not always manage to translate their innovations into effective application on the guitar as convincingly as he did in his *Percussion Studies* (1993a; 1993b).
There is a difference between the musical style of a piece and the scoring tools used by the composer to achieve the sounding outcome. Although there is a relation between the two (scoring can contribute to the articulation of musical style), the focus of this research is on the scoring dimension. The latest developments in musical experimentation do not automatically amount to innovations in scoring. Compositions may be innovative and experimental in musical terms, but use scoring means that are rather conventional, relatively ineffective or not realizable on the guitar. Despite their experimental nature, such compositions do not qualify to be singled out as examples of innovative use of scoring. Vice versa, some compositions, even from the nineteenth century, are written in a style that is conventional for their time, but original in terms of scoring, even from our contemporary perspective (see, for instance, the Left hand alone texture by Francisco Tárrega in Chapter 11).
This study discusses guitar scoring in detail, and there is great attention for the subtle relation between notation, guitar-technical intricacies and the sounding result. Such relations are best shown in short passages of a few notes or bars, in order to pinpoint exactly what works, what does not work and why. Not included in this study are detailed analyses of the structural relation between discussed passages and the works as a whole, structural analyses of complete compositions, or descriptions of the expressive potential of particular pieces. Rather, by emphasizing the presentation of a wide range of

scoring tools in detail, including attention for their expressive potential, this study aims to facilitate the work of composers writing large structures that allow for expressive performance.
The existing literature on solo guitar scoring consists of guitar scoring guides, contemporary guitar instrumentation guides and information on the guitar scoring potential in general orchestration guides (see section 3.1). Various aspects are missing in the existing literature on guitar scoring: information on how to use and combine individual sounds as building blocks in scoring, information on textures that are not made up of plucked sounds, an overview of the intervals and chords that can be scored, accurate information about notation and technical difficulties, and a presentation model that is relevant for composers. This study aims to add to the existing body of knowledge by providing an account of how guitar sounds can be used as building blocks in scoring, by providing information on textures that are not exclusively made up of plucked sounds, by giving an account of the possibilities to score intervals and chords, by correcting inaccuracies in a number of previous studies concerning technique and notation, and by aiming to create a presentation model relevant for composers, (see section 3.2, 3.3 and 3.4).

Theory

The dissertation introduces new concepts that are believed to be useful as tools and methods to describe and analyze scoring in guitar works, and in writing new compositions for guitar.

Sound-cell-texture chain: the *sound* concept captures the properties and characteristics of individual notes played on the guitar. The c*ell* concept captures the idiomatic ways in which *sounds* can be combined. The *texture* concept captures the way in which musical activity develops over time (a number of bars) and, through its timbral properties, density of intervals, number of voices, combination of *sounds*, temporal development and tempo creates a musical fabric possible on the guitar. The *chain* concept captures the simultaneous functioning of a musical passage on these three levels. For each sound category available on the guitar, a *sound-cell-texture* chain is presented.

The research further develops the perspective guitarist Chris Kachian presented in his work when he described the guitar potential through the musical textures that can be created on the guitar (Kachian, 2006, pp. 13-29). Unplayable or ineffective passages in guitar scores may stem from a lack of understanding of the way individual *sounds* become part of cells and textures.[5] The approach taken in this research is to describe the guitar's potential through the *sound-cell-texture* chain. The main thesis is that thinking through the potential of the guitar leads to more effective scoring, where effective scoring is achieved when the guitarist's performance of a score can sound in accordance with the sonic outcome suggested in the score.

[5] Some composers, for instance, treat the guitar as an instrument that can play a melody. In much of the guitar literature, such a melody is usually accompanied by a harmonic accompaniment. A melody with a harmonic accompaniment on the guitar is a texture that requires more knowledge about the instrument. If that knowledge is not available to the composer, the texture of the music may look underdeveloped in comparison to other aspects of the composition. Examples of such pieces are: *Gobelin Imaginaire* by Arletta Weiss, winner of the 2008 Barmenia guitar composition competition (Weiss, 2008) and *Serious and Sincere Sentiments about Something* by Matthew Shlomowitz (Shlomowitz, 2004).

Intended outcomes

Academic and artistic outcomes

Coessens et al. propose that artistic research should contain an academic and an artistic outcome, of which the artistic outcome can take the form of a work of art (Coessens et al., 2009, p. 73). In addition, the "new products and experiences" that result from the research should also be "meaningful in the world of art" (Borgdorff, 2010, p. 46). In this research trajectory, the guidelines for the way in which guitar scoring can be used as a vehicle for musical thought are the intended academic outcome, while the compositions written with the help of these findings are the artistic outcome. The research makes aspects of the creative process of writing new compositions for guitar visible by showing the scoring tools that have been developed in the research process. These tools are articulated in a manner that allows them to be shared with other artists who wish to compose for the guitar, and in a manner accessible and relevant for composers. The research contributes to the repertoire of the guitar by assisting in the creation of compositions written on the basis of an informed understanding of the guitar: an understanding acquired through research.

Contribution to the discussion on artistic research

Due to the relatively recent creation of doctoral programs in artistic research, doctoral researchers in this field are confronted not only by the specificities of their individual research projects, but have also been drawn into the parallel discussion on artistic research. This discussion involves questions on the legitimacy of artistic research as well as its values, delimitations, methods, benefits for the academic and artistic world, and questions about the nature of its dual character located in between these domains (Biggs & Karlsson, 2010a; Biggs & Karlsson, 2010b; Newbury, 2010; Borgdorff, 2010; Coessens et al., 2009). The effect of the artistic engagement of the artistic research with her subject of research and the inclusion of "an original work of art" (Borgdorff, 2010, p. 55) as an artistic outcome, is that the various research trajectories of artistic researchers differ and have a highly individual character. This, in turn, means that every doctoral project including the written account of the research can be a distinctive contribution to the body of experience in this field and, by extension, to the discussion on artistic research. This is particularly the case if the researcher is willing, in addition to contributing to knowledge on a specific and delineated topic of research, to articulate and communicate the nature and specifics of this contribution to the discussion on artistic research. This research intends to make such a contribution; in the opening chapters, the methodology, theories and context are outlined and linked to existing practices, while in the Discussion Chapter a section is dedicated to the academic contribution to the discourse on the complex of research in and through artistic practice.

Coessens et al. write that tacit knowledge and embodied knowledge play an important role in the artistic research process (Coessens et al., 2009). The concept of tacit knowledge, originating in the work of Polanyi (Yu, 2003; Polanyi, 1958) can be described as "knowledge that can not be fully articulated by verbal means" (Yu, 2003, p. 12). Embodied knowledge relates to tacit knowledge, and refers to the way the body tacitly "knows" how to perform actions without conscious reflection. This study intends to

contribute to the discussion on the role of tacit and embodied knowledge in artistic research by demonstrating a manner of eliciting the tacit and embodied knowledge present in scoring skills, by subsequently developing this knowledge through artistic practice, and finally by articulating and communicating this tacit and embodied knowledge through writing, through score examples, through video recordings and through new compositions.

Dissertation structure

In Chapter 1, Methodology, the research design and implementation are presented in detail, including the research processes, stages, and the application of theories, tools and methods. The Methodology Chapter contributes to answering the fourth research sub-question by sketching the grounded theory-based approach employed during the research process to generate a scoring theory.[6] Chapter 2, Research Context, describes the context of the subject of research by adopting the explanatory framework suggested for such a description by Coessens et al. (2009). In Chapter 3, Theory, theoretical approaches from previous studies are examined, voids in previous studies pointed out, while a set of concepts developed during the research process intended to fill these voids is presented, followed by an account of the way in which these concepts fill voids in the guitar scoring literature. The Theory Chapter contributes to responding to the third research sub-question by examining current theories and approaches to guitar scoring. Chapter 4, Guitar, Guitarist and Composer, traces the historical origins of the problematic relationship between the instrument, the performer and the composer.

Chapters 5-16 provide an overview of the twelve sound-cell-texture chains identified in this study, and give a report of findings relevant to these chains in a manner that allows artists wishing to score for the guitar to use these findings in their own creative scoring processes. These chapters contain a considerable amount of music score examples, ranging from historical to contemporary repertoire for the classical guitar, illustrating the theoretical framework generated from the grounded theory-based research on scoring elements in these scores. These chapters contribute to answering the second, third and fifth research sub-questions. The second sub-question is addressed by means of a structured and detailed outline of the sonic potential of the guitar, while the third research sub-question is addressed by means of revealing the scoring knowledge present in guitar compositions by viewing it through the sound-cell-texture chain perspective. The fifth sub-question is addressed through an evaluation of notation practices and suggestions for their improvement.

In Chapter 17, Etudes: Outline and Notes, an account of the composition process of the etudes is provided, as well as notes on each of the composed etudes. This chapter contributes to answering the sixth research sub-question by describing the relation between the scoring principles developed in the research trajectory and the etudes.

Chapter 18, Discussion, discusses the outcomes of the research trajectory: their scope and limitations,

[6] Grounded theory is a research methodology addressed in more detail in the Methodology Chapter.

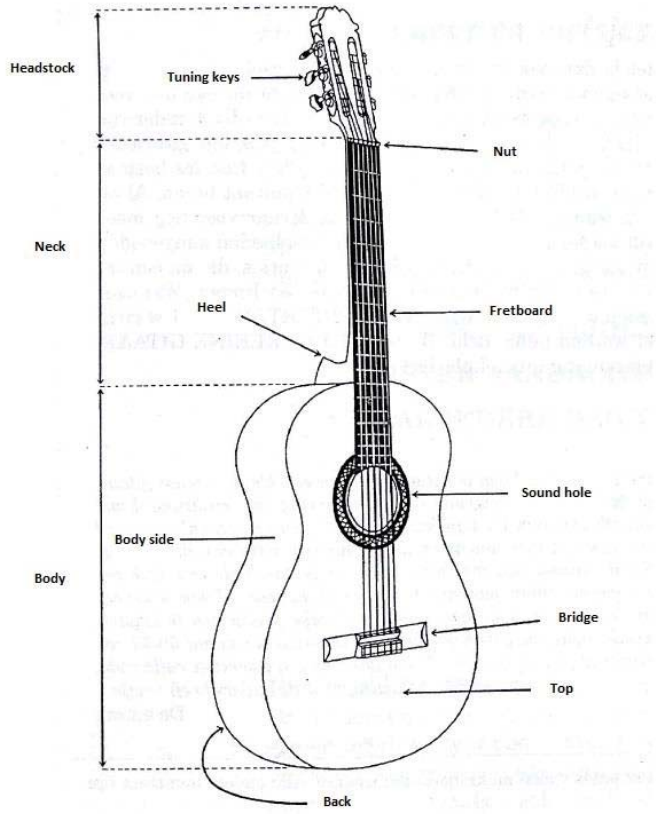
the role of tacit and embodied knowledge in the research process, the theoretical soundness of the sound-cell-texture chain, and the artistic and academic contribution. Finally, suggestions for future research are given.

Reading Guide

Score Examples

Examples have the name of the composer and composition included below them. When no such indication appears, the example has been created by me.

Guitar anatomy[7]



Guitar terminology

BARRÉ: The practice of simultaneously stopping multiple strings with one finger of the left hand.

CAPODASTRO: A device that stops all strings in a selected position, thus raising the open string pitches.

[7] The guitar drawing from this image originates from *De "kleine" Gitaarstarter* by Hartog (1992).

CIRCLED NUMBERS: These always refer to STRINGS in guitar scoring. A circled 1 refers to the first string, a circled 2 refers to the second string, and so on. Circled numbers are used to indicate fingerings; displaying a note with a numbered circle indicates that a note is to be played on that particular string.

FINGER 1,2,3,4: Designations used in guitar notation for respectively the index finger, middle finger, ring finger and little finger of the left hand.

FINGER C,A,M,I,P: Designations used in guitar notation for respectively the little finger, ring finger, middle finger, index finger and thumb of the right hand. These designations come from the Spanish words for the little finger (chiquito), ring finger (anular), middle finger (medio), index finger (indice) and thumb (pulgar).

FINGERING: Indication of a finger of the left hand to be used, a finger of the right hand to be used, the string on which a note is to be played, or a combination thereof.

NAILS AND FLESH: Guitarists cultivate nails on the right hand, but keep those on the left hand trimmed in order for them not to impede with the stopping of the string on the fretboard.

ROMAN NUMERALS: Indicates the fret position in which the leftmost finger of the left hand plays. In the case of natural harmonics, the Roman numeral refers to the fret above which the nodal point is found.

STRINGS: The six strings of the guitar are indicated through numbers; the highest string is referred to as the first string, with the numbers counting up toward the lowest, sixth string. The highest three strings are made of nylon, while the three bottom strings are metal-wound nylon strings.

Definitions of frequently used terms

ARTICULATION: "The separation of successive notes from one another, singly or in groups, by a performer, and the manner in which this is done.... the term 'articulation' refers primarily to the degree to which a performer detaches individual notes from one another in practice (e.g. in staccato and legato)" (Grove Music Online, 2012b).

ARPEGGIO: "The sounding of the notes of a chord in succession rather than simultaneously; also, especially in keyboard music, the breaking or spreading of a chord" (Grove Music Online, 2012a). A guitar arpeggio differs from this standard definition of an arpeggio; because the individual notes that make up a chord on the guitar are spread over multiple strings, a technical guitar arpeggio is a succession of notes scored over multiple strings.

CELL: This concept captures the idiomatic ways in which sounds can be combined in intervals and chords (vertical cell) or short sequences (horizontal cell). For the distinction between chords and vertical cells, see: vertical cell.

CLUSTER: "A group of adjacent notes sounding simultaneously" (Grove Music Online, 2012c).

CHORD: “Any simultaneous combination of notes, but usually of not fewer than 3” (Oxford Dictionary of Music, 2012a).

EFFECTIVE SCORING: Scoring that can be made to sound in accordance with the sonic outcome suggested in the score.

EMBELLISHMENT: ”That element in music which is decorative rather than structural, and which in particular includes both free ornamentation and specific ornaments, whether indicated by notes or signs in the notation or left to be improvised at the discretion of the performer” (Grove Music Online, 2012d).

GLISSANDO ILLUSION: A glissando that connects notes or vertical cells by only bridging part of the pitch distance between the notes or vertical cells.

HARMONIC FLEXIBILITY: The degree of freedom available to the composer to choose pitches and pitch combinations in various registers, and combining various registers on the instrument, as opposed to the degree of constraint to the set of choices. Single line horizontal cells of plucked sounds are an example of horizontal cells with low constraints and high harmonic flexibility, while single line horizontal cells of rasgueado sounds are an example of horizontal cells with high constraints and low harmonic flexibility.

HOMOPHONY: “A term used to describe music in which one voice or part is clearly melodic, the others accompanimental and chiefly chordal” (Oxford Companion to Music, 2012a).

IDIOMATIC SCORING: Scoring that is ideally suited for performance on the guitar by a professionally trained guitarist, and that can be made to sound on the guitar in accordance with the instructions in the score. Idiomatic music may be easy or difficult to a performer, depending on the level, strengths and weaknesses of the individual performer.

MONOPHONY: “A term used to denote music consisting of only one melodic line, with no accompaniment or other voice parts (e.g. plainchant, unaccompanied solo song), as opposed to polyphony and homophony (each having several parts)” (Oxford Companion to Music, 2012b).

LITERAL GLISSANDO: A glissando that connects notes or vertical cells by bridging the complete pitch distance between the notes or vertical cells.

ORCHESTRATION: “The art of combining instruments and their sounds in composing for the orchestra, or, more simply and practically, the act of scoring a sketch or an existing work for orchestral forces. By extension, the term may also be used in the context of music for chamber forces or even for chorus or solo piano, since the basic concerns of orchestration —with balance, color, and texture—are common to music of all kinds” (Hurd & Griffiths, 2012).

REGULAR PLUCKED NOTE: the sound that emerges from the standard way of plucking the string. The designation “regular plucked note” is used in this work to distinguish it from other plucked sounds such as harmonics, which are plucked and lightly touched.

SCORDATURA: “A term applied largely to lutes, guitars, viols and the violin family to designate a tuning other than the normal, established one” (Boyden & al., 2012).

SCORING: "The art and process of orchestrating a composition" (Oxford Dictionary of Music, 2012c).

SINGLE LINE/VOICE: see monophony.

SOUND-CELL-TEXTURE CHAIN: This concept captures the simultaneous functioning of a musical passage on the sound, cell and texture three levels.

SPACING: "The arrangement of the notes of a chord with respect to the intervals separating them" (Rushton, 2012). In this research, a spacing is called narrow if it contains no intervals larger than a fourth.

SOUND: This concept captures the properties and characteristics of individual notes played on the guitar.

TEXTURE: This concept captures the way in which musical activity develops over time (a number of bars) and, through its timbral properties, density of intervals, number of voices, combination of *sounds*, temporal development and tempo creates a musical fabric that is possible on the guitar. It relates to the definition used in the Grove dictionary: "A term used when referring to the sound aspects of a musical structure. This may apply either to the vertical aspects of a work or passage, for example the way in which individual parts or voices are put together, or to attributes such as tone color or rhythm, or to characteristics of performance such as articulation and dynamic level" (Grove Music Online, 2012g).

TIMBRE/TONE-COLOR: "The quality of sound characteristic of a particular type of instrument or voice, as opposed to its register or pitch" (Bellingham, 2012). In this research, timbre refers to the way in which the timbre or tone color of a sound may be changed.

TRILL: "A type of embellishment that consists in a more or less rapid alternation of the main note" with the "tone or semitone above it. Different types of trill, or shake, are distinguished according to the way they begin, how long they last and how they end" (Grove Music Online, 2012h). In addition, a trill can also consist in an alternation of the main note with the tone or semitone below it.

TUNING KEY GLISSANDO: Refers to a pitch glissando performed by detuning a string with the tuning key.

VERTICAL CELL: Vertical combinations of sounds. This definition is deliberately broader than that of a chord, as it also includes two-note intervals, note combinations of at least three notes that contain less than three pitches, such as unisons, but guitar-technically provide the same possibilities and pose the same challenges as chords.