TSMT Proceedings

Quinquennial Publication of Abstracts
(1978~1982)

Texas Society for Music Theory

1983

INTRODUCTION

It is with great pleasure that the Texas Society for Music Theory issues this Quinquennial Publication, providing the membership with a record of the Society's major endeavors during the past four years. It is evidence of the Society's growth and its diverse interests.

The inception of the Society was an unpretentious one: a theory forum called in March, 1978, at the University of Texas at Austin, featuring a 'white paper' by Gregory Proctor on "A Theory of Chromatic Processes and Its Practical Pedagogical Application," with respondents from six campuses. At this forum, the idea for formulating a theory society was discussed without formulating any precise course of action towards that goal. On March 8 of the following year--almost one year to date from the Austin forum--a one-day meeting was called at North Texas State Univeristy, during which several papers and workshops were presented, and the Society was formally organized, adopting the name Texas Society for Music Theory (after the national SMT). Jim Riley was elected as the first president, and five others as members to the executive board. Since then, the conference has met at various campuses--Baylor, U.T. Austin, Angelo State.

One of the express goals of TSMT is to make the activities of the Society scholarly as well as practical. The programming committee has indeed been true to the spirit of the above goal, as the content of this publication will witness. There are, to be sure, many other goals which are yet to be realized, and these are attainable with the continued endeavor of the Executive Board, present and future, and with increasing support from each member of the Society.

This volume contains abstracts of many papers and workshops presented at various conferences during the past four years. Due to the large number of papers, a certain limit was imposed with regard to the length of each abstract. It is hoped that these abstracts will serve not only as a record of the Society's activity but also--more importantly--as a basis for our continued dialogue. It is also to be hoped that similar publications will ensue with greater frequency.

The Executive Board would like to take this opportunity to express its deep appreciation to those who have contributed unselfishly to make this publication a reality.

Gene J. Cho (N.T.S.U.), President
Dorothy Payne (U.T. Austin), Secretary
Claude L. Bass (SW Bapt. Seminary), Treasurer

Herbert Colvin (Baylor)
Charles M. Joseph (SMU)
William Schroeder (Del Mar)

TSMT First Annual Conference
March 9, 1979
at North Texas State University

"Computer-Assisted Music Instruction at NTSU" . . . . .R. Adams and S. Bertsche

"The Dichotomy of Harmonic Rootedness: Conception vs. Perception" . . . . G. Cho

"Density Functions in the Structure of Modern Music" . . . . .T. Clark

"Stravinsky's Variations for Orchestra: Extension of Serial Technique" . . . . .B. Faulconer

"Debussy's La Cathedrale Engloutie: The Integration of Motive, Tonality and Form" . . . . .J.C. Groom

"Musical Form: The Role of Analysis in the Perception of Aesthetic Unity" . . . . .R. Hanna

"The Role of Psychacoustics in Music Theory" . . . . R. Killam

"Some Comments on Linear Continuity in Brahms' Opus 116, No. 4" . . . . .L.P. Miller

"Applications of Chromatic Solfage in the Aural Skills Instruction" . . . . .D. Payne

"Wave Theory and the Creative Process" . . . . R. Pellegrino

"Boulez' Sonatine for Flute & Piano: Notes on a Rehearsal Progress" . . . . L. Watson

THE DICHOTOMY OF HARMONIC ROOTEDNESS: CONCEPTION VS. PERCEPTION

Gene J. Cho
North Texas State University

The prevailing pedagogical approach to the understanding of harmonic vocabulary of tonal music is derived largely on theoretical concepts expounded by two theorists; Jean Phillippe Rameau (the concept of fundamental bass and the invertibility of tertian chords) and Gottfried Weber (the concept of Grundharmonie--chord built on each of the diatonic tones as "root"--and the employment of roman numerals in representing the root of these diatonic chords). The essence of Weber's Grundharmonie was already present in Rameau's theory of fundamental bass which, with minor modifications, was continued by later theorists such as Tartini (1692-1770), Kirnberger (1721-1783) and others, who spoke in terms of Hauptaccord (chord with functionally interpretable root). Therefore, Weber's singular contribution in employing the roman numerals as a means of chord labelling can be seen as only a logical step in the later stage in the history of harmonic-root thinking during the late 18th century, post-Rameau era.

This method of chord labelling via roman numerals, coupled with the figured-bass indication for harmonic inversion, has long been a principal, if not often the only means of harmonic analysis particularly in the classroom instruction. It is undeniable that such method provides a pedagigically expedient vehicle for harmonic analysis. However, the exclusive and unquestioning adoptation of the method may at times invite undesirable distortion or misrepresentation of the inherent musical signification.

The problem of harmonic rootedness is not only a conceptual (i.e. theoretical) but also a perceptual (i.e. aural) and, therefore, a pedagogical one. Consider, for example, the possible discrepencies in chord symbols and even in root identifications among theory instructors in making a harmonic analysis of a given example, or, the difficulty many students in, say, a freshman ear-training class encounter in differentiating the first-inversion supertonic seventh chord and the subdominant harmony.

The core of these and other like problems lies principally in the differentiation between the chord labelling and the harmonic functional interpretation. The former implies methods of identifying chord-root as spelled regardless of its surrounding chords, while the later implies interpreting harmonic signification of a particular chord in the context of harmonic progression within a given musical phrase. While these two viewpoints are often mutually supportive, they are not always identical. That is to say, the "root" identified by the manner of spelling on a printed page does not always support that that note will be heard as such. For example, it is theoretically possible to construct a fully-diminished supertonic 7th chord. However, to interpret the chord as supertonic 7th is musically unjustifiable.

It is worthy of note, if not somewhat comforting also to know, that these harmonists (Rameau, Tartini, Kirnberger, Weber, Riemann, etc.) recognized the existence of disparity between conception and perception with regard to harmonic rootedness. This dichotomy of harmonic rootedness has been dealt with by various writers primarily in terms of (1) minor harmony, and (2) chromatic chords such as (a) equidistont chords (augmented triad and dim. 7th) and (b) augmented sixth chord. Various theorists proposed different viewpoints, but all having one aspect in common: the chordal interpretation is dependent on the harmonic context.

I Minor Harmony

Many theorists recognized the problem of root-tone identification in the minor harmony. The speculative aspects (e.g. the dualistic approach to minor harmony) aside, Tartini and others proposed, for example, that a minor harmony has two possible root-tones: the primary root (the lowest tone in the tertian spelling) and the secondary root which is the 3rd of the "spelled" chord. The possibility of a minor harmony having another root besides the spelled root is not only suggested but also illustrated by Rameau, particularly when the chord appears in the "inverted" form. He proposed that the choice of root is to be determined in terms of the chord following the one in question. That is, the rootedness of a chord is often to be decided not by the manner in which it is spelled but by how the chord is connected or resolved. (Although not a minor harmony, Kirnberger pursued the same line of thought when he regarded the so-called tonic 6-4 chord as having different functions depending on the chord following it.)

A minor harmony, then, often assumes a different harmonic function from its spelled version. For all practical purposes, it may be suggested that the harmonic root is identical with the spelled root when the minor chord is in the root position; the harmonic root is the bass note when the chord is in the first inversion. It goes without saying that the harmonic root is the bass note when the triad is in the second inversion--i.e. the so-called 6-4 dissonants, with the two upper tones requiring resolution. This, of course, is true in both major and minor harmony.

II Chromatically Altered Harmony

A) Augmented Triad

Weber's roman numeral system is formulated to indicate not only the root but also the chordal quality of each of the diatonic chord as well. The diatonic chords of the major mode are: I, ii, iii, IV, V, vi and vii^{o}. For the minor mode, on the other hand, Weber (and Vogler) listed the diatonic chords as: i, ii^{o}, (III^{+}), iv, V, VI and vii^{o}. This listing is significant: these writers conceived the diatonic chords in the minor mode as deriving solely from the "harmonic minor" scale (i.e. no recognition of the major mediant or the major subtonic chord as diatonic chord in the minor mode).

More significantly, however, is Weber's chord symbol for the diatonic mediant chord in the minor mode: the symbol assigned to it is III^{+}, implying that the chord as a diatonic sonority is an augmented triad. However, Weber regarded this chord as a non-"Grundharmonie"--meaning, a chord without one particularly identifiable tone as the root-tone. It goes without saying that the root of the chord can be identified by the way it is spelled. However, it should be recognized also that the chord is an equidistant chord--chord containing equal-sized intervals--and, as such, the function and its harmonic gravitational direction is ambigous and it is nearly impossible to identify the root-tone by merely listening to it. Also, since it is an equidistant chord, it yields itself to multiple enharmonic spelling possibilities--each of the chordal tone can be regarded as the root. This quality of harmonic ambiguity intrinsic to all equidistant chords makes the harmonic function (usually of dominant function) of the chord dependent upon the chord of resolution.

B) Augmented Sixth Chord

An augmented sixth chord, as commonly presented in theory textbooks, is a subdominant, subdominant 7th or a supertonic 7th chord, with two altered tones (i.e. raised 4th and lowered 6th scale degrees) which form the characteristic interval of a diminished 3rd, with another version having the raised 2nd degree (this form appears only in the major mode). Also, these chords usually appear in certain inversions, making the lowered 6th degree appearing in the lowest part thus forming, with the raised 4th degree, the augmented sixth interval of the namesake.

With only some superficial differences in symbols used, these chords are generally labelled with roman numerals indicating their spelled roots. Such symbols for augmented sixth chords may be convenient in terms of visual analysis but are somewhat misleading musically. For the sonorities are neither major nor minor, as the roman numerals imply. Additionally, the spelled root could not in anyway be heard as the harmonic root. If there is to be any audible root, it is more reasonably the lowered sixth degree: for, with the raised 4th degree it forms an (enharmonic) interval of a minor 7th. When the chord is played as an entity, it will sound either as a major-minor 7th chord, or as a "rather diminished sounding" seventh chord with the so-called French sixth, due to the fact that it contains two tritones unequally spaced. These augmented sixth chords can only be properly interpreted with regard to their harmonic function by the chord(s) following it: it is either an altered subdominant-functioning chord containing two tendency tones to the root of the dominant harmony, or an enharmonically spelled dominant-functioning chord of the Neapolitan harmony, or a peculiar mixture of altered subdominant and dominant-functioning chord, as is frequently found in the music of the late 19th century (thus may be called "dominant augmented 6th").

This discrepency between the visual and the aural comprehension of augmented sixth chords has been recognized by harmonists. Marpurg (1718-85), for example, called it a "fantastic chord of <u>seventh</u>," while Kirnberger simply regarded it as a purely passing chord, and Roussier, in his <u>Treatise</u> (1764), called it a "mixed dominant." Weber classified augmented sixth chords among the "non-essential chords," inferring, similar to Kirnberger's view, that root-tone identification is rather superfluous and unnecessary. Alfred Day, furthermore, maintained in <u>Treatise</u>, 1845, that there are double roots in the augmented sixth chords.

Recognizing perhaps the inadequacies of harmonic analysis <u>via</u> roman numerals, Hugo Riemann (1849-1919) proposed that all chords, diatonic or chromatically altered, should be interpreted as having one of the three primary functions: tonic, subdominant or dominant. He classified all possible chordal sonorities under these three functions: either as a primary function of Tonic, Subdominant, or Dominant, or as their substitutes ("parallel chord").

While the use of these functional letter symbols--T, S and D--appears rather lax in preciseness, it nonetheless accomplished where the roman numerals system fails: in bridging the gap between the aural and visual comprehensions or, between the conceptual and perceptual understanding of harmonic behavior in tonal music, and that, a chord does not have an inherent meaning unless it is heard in the context of a harmonic progression.

It is not the intention of this paper to propose that the roman numeral system be discarded or even slighted. It is to suggest, however, that a less dogmatic or, more flexible application of the roman numeral labelling method be employed, so that the task of root-tone identification will not become an undue chore in the course of harmonic analysis at the cost of neglecting a musically more significant aspect--the behavior of a chord in the given phrase. Particularly, when the root-tone identification is somewhat doubtful, such as those mentioned here, a forcibly imposed "theoretical" labelling may in fact contradict with the harmonic signification inherent in the music, as those 18th-19th century harmonists seemed to have realized and attempted to resolve. It is to further suggest that Rameau-Weber system be supplemented wherever feasible with the Riemann or like system, so that, jointly, a more meaningful musical interpretation can be sought in the process of harmonic analysis. If nothing else, it is at least worthy of posing ourselves the question: which is more important and of lasting value: the ability to identify the individual root-tone, or the sensitivity to comprehend the musical significance of a particular chord in the harmonic context? Perhaps the former is incipient to the latter. But, without the latter, the former may become a mere intellectual exercise, a musically meaningless and artless process.

Among examples discussed in this paper (omitted from the abstract) were:
Schubert, Moments Musicaux. No. 6, mm. 1-16.
Brahms, E-minor Symphony. Mov. IV, mm. 1-8.
Wolf, "Das verlassene Maeglein," mm. 1-12.

DENSITY FUNCTIONS IN THE STRUCTURE OF MODERN MUSIC

Thomas Clark
North Texas State Univ.

Concepts of analysis are increasingly interwoven with the terminology and methodology of science. However, much of the borrowing, although promising in potential, takes place on an ill-defined metaphorical level. Such a concept is density, which in the physical sciences represents a mathematical relationship of mass to volume (or substance/space).

Density as an aspect of musical structure, although of considerable analytic interest, lacks the rigor of definition or quantification. Intuitive notions of textural and rhythmic density (representing the concept in two dimensions of a musical field) operate on the periphery of some analytic thinking. Crude estimations of larger/smaller, thicker/thinner are useful in a realm of observation that would require too much repetitive counting and measuring work to submit to a quantified accuracy. (The computer is, of course, a tool for performing precisely this kind of humanly impractical repetition of task.)

Before measurement of quantities, musical space, and density can occur, essential conceptual decisions must be made. What are the musical parameters which will be most insightful when counted and combined? Computer-generated data has been useful in answering these fundamental questions. With the speed to "try out" different concepts or parametric approaches on sample pieces, information can be obtained that will aid in the selection of those parameters or approaches that seem most fruitful.

Significant data for this study includes these definitions or expressions: time length of a measured unit (S); number of contrapuntal voices (V); number of notes in a voice in one unit (N); number of semi-tones traversed by a voice (I); total compass or range (in s.t.) of a voice (C); accumulated duration of actual sound in a voice (D); total width of a texture (in s.t.)(T); number of moments containing the initiation of a note in any voice--composite rhythm (A); average interval size, I/N; linear interval density, I/C; average duration, D/N; linear density for all voices, SUM(ID/NS); textural density, SUM(C/T); attack density, A/S; and durational density, SUM(D)/VS.

There is a conceptual problem in determining criteria for evaluating the relative usefulness of these functions. Since all values fluctuate through time, the degree of fluctuation is suggested as a criterion, but an illusive one. Fluctuant behavior of a quantifying function is significantly affected by the size of time unit applied to measuring its values; thus time-span and hierarchical levels enter into consideration. What time levels of activity, for a particular piece, are most and least fluctuant in activity? What degree of fluctuation is analytically most insightful?

Fluctuation of a function, first of all, can be computed as the percentage of increase or decrease of a value as compared to the average of the present and former values. A final report of the average fluctuation exhibited by each function allows comparison when several computer runs through a set of data from a piece with different measuring units of time. The effect of varying the size of measuring segments is then shown in graphs representing the behavior at different time levels of all the functions considered. Time levels producing median levels of fluctuation in most of the functions are then chosen for actual measurement and graphic representation of density functions for a particular piece.

Much modern music seems to be based upon the use of sounds not as components of a stylistic tradition so much as raw, physical, perceptual phenomena. A well-defined notion of density in such music could now be measured and thus describe precisely a crucial dimension of structure.

A piece which by no means universal in design yet exhibiting an appealing symmetry was chosen for initial tesing: the second movement of Webern's Op. 21, Symphony. Serial pitch organization was not particularly a factor in this selection; sectional divisions equal in length and varying considerably in activity level were the attractive aspects of the theme-and-variation structure. Each variation appears to be a different mode of filling musical space with activity. Discreetly measured equal samples of these various activity levels are delimited and analyzed. A picture of the entire movement can be drawn according to density functions. Parallel and contrary relationships between these function curves considered in pairs trace several "contrapuntal" patterns; a scenario of form with respect to density would be the combined interaction of these patterns.

More difficult and more recent pieces were chosen and studied to expand the application of density theory into musical situations not as transparent or predictable in character as the Webern but nonetheless apparently oriented in their structure around significant changes in levels of activity and registral space. Stockhausen's N. 5 ZEITMASSE (1957) is highly complex in contrapuntal rhythmic structure, exhibiting a large variety of textures and activity levels; the first 2 minutes were analyzed. The first 22 bars of Earle Brown's PERSPECTIVES (1952) for piano were also encoded and examined, partly to test the applicability of procedures to the potential problems of a piano texture. Challenging notational features include frequent, drastic tempo changes seldom occuring at beginnings of measures, and the lack of a defined or consistent metric structure necessitating creation of changing 16th-note pulse meters such as 17/16. The score of PERSPECTIVES is deceptively unindicative of changes in basic activity levels, largely because of the apparent visual distortion created by notated tempo changes. As with ZEITMASSE, it is more accurately pictured and its structural behavior analyzed in terms of densities. The first movement of Karel Husa's String Quartet No. 3 (1969), containing linear material of strongly varying intervallic, registral, and rhythmic densities, was also studied.