

The Influence of Linear Thinking on the Harmonic Language of Mahler's Third Symphony—An Analytical Practice Based on the Theory of Linear Thinking

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Abstract: As the nineteenth century gave way to the twentieth, the boundary between homophonic and polyphonic writing was increasingly dissolved, and linear progression emerged as a means of weakening tonal function. Drawing on linear thinking, Mahler cultivated idiosyncratic devices—characteristic harmonic motives and composite harmony—to propel tonal music toward the new idioms of the twentieth century. His Third Symphony employs linear progressions to grow from a core motive into an organism unified by tonal coherence. Combining R  ti's thematic-motivic analysis with Salzer's post-Schenkerian approach, this article elucidates the constitutive features of Mahler's harmonic language through multiple thematic layers and the linear prolongation of contrapuntal voices.

Keywords: Mahler; Linear thinking; Thematic-motivic analysis; Structural prolongation

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1. Theoretical elucidation of concepts related to “linear thinking”

As tonal music moved into the mid-to-late Romantic period, the principles of functional harmonic progression were gradually eroded. Linear thinking—a potent complement that broke through the constraints of functional harmony—hastened the collapse of the tonal system and marked a decisive turning point in Western music after 1900. In this transformation, Gustav Mahler (1860–1911) extended the linear thinking characteristic of German-Austrian music to both horizontal levels and the interior of vertical sonority. Unlike Renaissance strict counterpoint, he infused linear-developmental thinking into harmonic progression, formal structure, and tonal layout alike, furnishing a theoretical basis for understanding polytonality, composite harmony, motivic continuity, and tonal expansion in his symphonies.

In Chinese scholarship, the term “linear thinking” initially denoted the horizontal-developmental

thinking of traditional Chinese music ^[1]. After Kang Jiandong and Ye Hongde adopted it as an analytical concept for twentieth-century Western music, it was gradually introduced into discussions of both contemporary Chinese and Western composition and analysis ^[2]. The term thus carries a dual lineage: one rooted in the melodic priorities of Chinese musical aesthetics, the other in the technical vocabulary of Western music theory. This convergence of perspectives makes “linear thinking” an especially productive lens through which to examine music that straddles the tonal and post-tonal divide.

Several analytical theories address linear development in tonal music: the core Schenkerian concept of linear progression or prolongation; Salzer’s expanded notion of “tonal coherence”; Kurth’s idea of the “linear” set out in *Grundlagen des linearen Kontrapunkts*; and Kramer’s distinction between “linearity” and “nonlinearity” in *The Time of Music* ^[3]. All of these revolve around the latent horizontal-developmental logic of tonal music, stressing antecedent-consequent connections among musical content, structural form, and tonal design.

Chinese scholars have devoted growing attention to linear thinking, applying Schenkerian, post-Schenkerian, and linear analysis to the country’s own musical culture. The most influential contribution is Professor Yao Henglu’s concept of “harmony of linear thinking,” formulated on the basis of Schenkerian linear progression as applied to contemporary Chinese music ^[4]. The concept refers to the expansion of multi-voice sonority while retaining certain principles of functional harmony: as vertical chords accumulate through superposition, the chord succession acquires a linear-developmental logic governing the direction of tonal motion. Taking the tonal characteristics of Mahler’s music into account, the present article employs both thematic-motivic analysis and Schenkerian graphic analysis, proceeding from motive and theme to uncover the deep linear forms concealed beneath harmonic materials.

2. Linear conception of pitch organization

Linear thinking in Mahler’s compositional practice is set in motion by coherent logical development at the lower levels of musical structure—the melodic themes and pitch organization of local passages. Compared with other German-Austrian composers of his generation, Mahler draws on a larger stock of rhythmic and melodic motives, together with multiple distantly and closely related keys orbiting the tonal center, and he frequently applies the principle of symmetry to melody, harmonic progression, and formal structure. The density of motivic material in his symphonies—and the relentlessness with which he derives new thematic configurations from the same small cells—is itself an expression of linear thinking.

Combined with thematic-motivic analysis, one finds that every motive and musical idea in the Third Symphony is fully developed; brief materials are gradually extended into a work of monumental structure. The thematic material rests upon an irregular phrase structure in a mixed homophonic-polyphonic texture, breaking the balance of traditional symphonic conventions through non-periodic phrases. The harmonic language often unfolds single or multiple motivic ideas and specific guiding harmonies in several voices against a background of pedal tones, so that the surface of the music teems with activity while deeper structural voices maintain a sustained directional logic.

2.1. Thematic-motivic linear developmental characteristics

The horn’s “Pan awakes” theme that opens the first movement (mm. 1–11) is built from symmetrical figurations comprising four different intervals (**Figure 1**). The first four measures can be parsed into four

motivic elements, from which multiple thematic transformations are derived and sustained throughout the entire work. The characteristics of the horizontal linear development of this theme are embedded into the voices at deeper structural levels:

The unfolding characteristic of tonal melody—prolongation of melodic structure: The eleven-measure theme combines disjunct and conjunct motion. Intervallic leaps of the fourth and fifth serve as important carriers of linear movement between voices, while the stepwise transitional progression formed by neighbor notes and passing tones becomes the driving force of voice-leading. The theme unfolds from the dominant note A, rises step by step, and upon reaching its highest point descends back to A, forming a musical arch. This arch-shaped trajectory is not merely a surface contour but a structural prolongation: the upper-voice motion from A through its upper neighbor and back articulates a deeper harmonic motion that sustains the dominant, even as the melodic surface suggests departure and return.

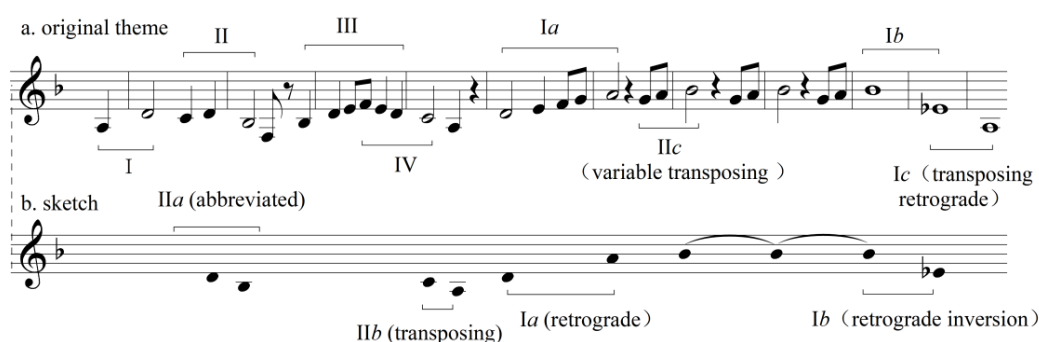


Figure 1. Example 1: Thematic-motivic analysis of the “Pan awakes” Theme, first movement.

Following Salzer’s concepts of “melodic structure and prolongation,” the four motivic elements encompass three modes of manifestation: Motive I represents “motion outlining an interval”; Motives II and III, revolving around B-flat and D, constitute “motion of embellishment”; Motive IV and Ia exemplify “motion that fills in an interval.” The unfolding of the melody is thus understood as a melodic prolongation whose purpose is to emphasize the harmonic contour. The distinction among these three modes is analytically consequential: it reveals that what might appear to be four independent motivic ideas are in fact three facets of a single prolongational process, each contributing a different kind of linear motion to the overall trajectory.

Structural symmetry: Motives I–IV aggregate the fourth-fifth tonic-dominant relationship along with third intervals, developed through inversion, transposition, and diminution. The melodic development revolves around a specific axial pitch, producing three symmetrical structures—fourth-symmetry, third-symmetry, and fifth-symmetry (2+2+5 measures). Arch-like symmetry pervades virtually every musical level of Mahler’s works, from thematic melody to formal structure and tonal layout. This pervasive symmetry is not decorative but generative: it ensures that the same intervallic relationships that govern the local melodic surface also operate at the largest formal and tonal levels, binding the work together through a network of proportional and intervallic correspondences.

2.2. The continuity of characteristic harmonic motives

In the preface to *Mahler and the Symphony of the 19th Century in a New Interpretation*, Constantin Floros distilled four of Mahler’s most important compositional techniques: alongside borrowings from song

repertoire and specific sonic symbols, they include two motivic devices—characteristic motives and guiding harmonies ^[5]. These harmonic or chordal motives, invested with special semantic meaning, possess both the function of “guiding harmony” and the semantic quality of “leading idea,” representing an important harmonic phenomenon of the late Romantic period. As in Mahler’s other symphonies, the Third contains multiple motivic sonorities with symbolic meaning, repeatedly transformed under linear development and running through the entire work.

2.2.1. The minor triad symbolizing death

The fortissimo sustained minor triad that erupts unexpectedly after a rest was frequently employed by Wagner, Liszt, Mahler, and Strauss as a symbol of death and the afterlife. In the Third Symphony, the minor triad—usually the tonic triad of the key in which it appears—likewise symbolizes death. Shortly after the first movement begins, the “Funeral March” starting at Rehearsal No. 2 is saturated with a deathly stillness diffused by the sustained tonic triad of D minor, until it resolves to a diminished seventh chord at m. 53, thereby investing the characteristic motivic harmony of minor triad–diminished seventh chord with new meaning.

2.2.2. Variational derivation of the characteristic second interval

The stepwise melodic second likewise carries symbolic meaning, recurring in several movements and, together with the four-note group, diminished seventh chord, and minor triad, constituting characteristic harmony. From the moment the muted trumpets sound a minor-major seventh chord like a “terror fanfare” (mm. 31–33), the interval of the second is concealed within the unfolding of the entire work, expressing through its tense harmonic color emotions of anguish and parting. As a characteristic harmony, the second later assumes a dominant position in the themes of the fourth and fifth movements; the major-second motive revolving around the dominant note (fourth movement) and the tonic note (fifth movement) becomes an effective means of harmonic prolongation, and a variant form of dominant and tonic pedal. Its ambiguity—functioning as a melodic connector, a harmonic dissonance, or a structural pivot—allows Mahler to exploit all three roles at different points in the symphony.

2.3. Emphasis and linear pervasion of the core four-note group

After distilling the core pitches of the horn’s “Pan awakes” theme, they can be reordered to yield the tetrachord D–C–B-flat–A, with a pitch-class intervallic profile of 2.2.1 (**Figure 2**). Proceeding stepwise from dominant to tonic within the D-minor framework, this tetrachord is transposed to other keys through internal filling or external embellishment, becoming another characteristic harmonic motive. Its variational development not only enhances unity of musical material but also foregrounds the core pitch idea, constituting the principle of tonal harmonic development based on a tonic-dominant architecture in Mahler’s works. The tetrachord is thus both a melodic seed and a harmonic skeleton: its stepwise descent from dominant to tonic encodes the most fundamental tonal motion of the entire symphony in miniature.

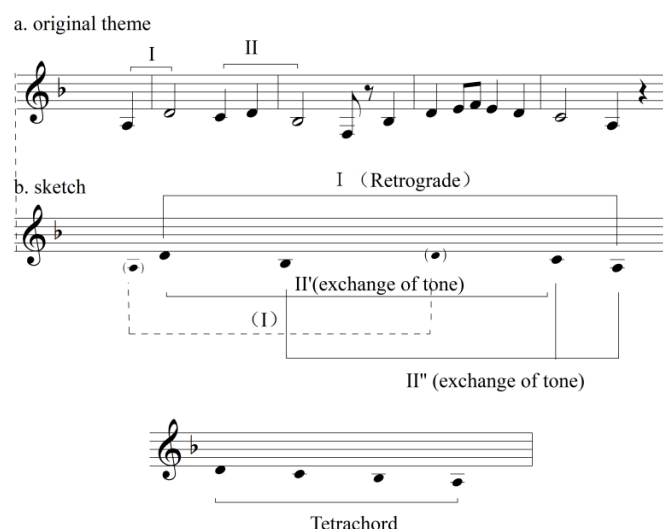


Figure 2. Example 2: Core pitch tetrachord of the “Pan awakes” theme.

Subsequently, in the “Funeral March” (mm. 37–42, 44–49) and “Recitative” (mm. 52–57, 73–75) of the first movement, the cello and double bass, through glissando-like rapid scalar ascent, furiously repeat transformations of this tetrachord motive. The wide-spanning glissando causes the register to rise precipitously, instantly intensifying harmonic tension—borrowing diatonic or chromatic scales to rapidly elevate the melodic register within the same harmonic framework, or connecting pitches of two different harmonies. This abrupt technique of “surprise,” produced by a fortissimo attack on specific pitches, appears in the symphonic works of Beethoven, Bruckner, and Berlioz as well. The tetrachord undergoes a metamorphosis in these passages: what began as a compact stepwise descent is now stretched across a wide registral span, its intervallic identity preserved even as its melodic shape is drastically transformed.

3. Linear conception of harmonic motion and tonal development

Linear-developmental thinking not only permeates local pitch organization and voice leading within movements but extends into interactions among multiple structural levels, forming a linear development of the overall structure. Mahler’s global linear thinking is manifested first in the tonal layout: the succession of formal sections unfolds from the tonal center, with tonal changes generally confined within a tonic-dominant or tonic-subdominant framework, frequently employing modal mixture between parallel or relative major and minor keys to create shifts in tonal color.

3.1. Tonal coherence in the overall tonal layout

The Third Symphony begins in D minor and concludes in the parallel major, D major. The six-movement symphony is divided into two parts (first movement; second to sixth movements) and three movement groups (first; second and third; fourth to sixth). The number of movements in the three groups increases progressively (1:2:3), and corresponding to this is a logical design of linear progression in the tonal centers, causing harmonic tension to exhibit a comparatively strong tendency to increase (**Figure 3**). The entire symphony can be understood as an elaboration of a single tonic prolonged across six movements.

The design of multiple movements and the simultaneous introduction of minuet and scherzo subvert the symphonic genre model established by Haydn. Mahler's formal conception, seemingly bold and innovative, is in fact rooted in classical forms—integrating thematic motives into the linear development of harmonic language on the logical basis of traditional tonal functional progressions, a rejuvenated presentation of the German-Austrian symphonic tradition against the historical backdrop of the twentieth century.

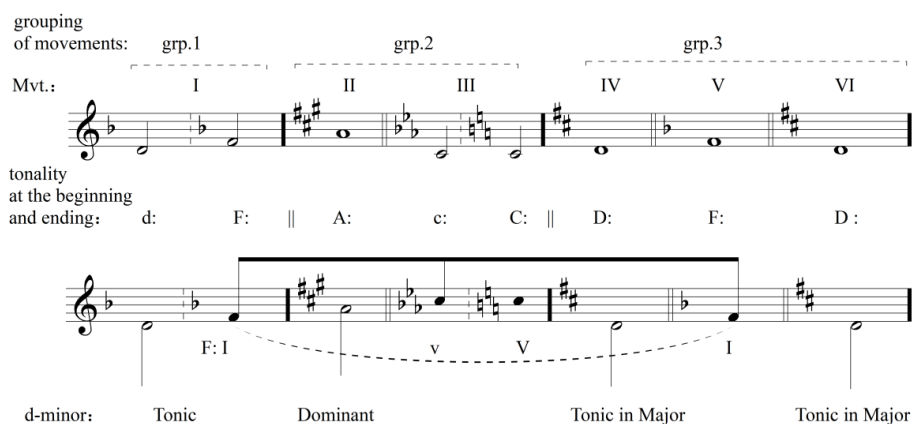


Figure 3. Example 3: Linear logic of the overall tonal layout of the third symphony.

The fifth-symmetry between tonal centers contrasts with the third-related tonal changes of adjacent keys. The frequent alternation between keys related by the second or third within a fourth-fifth framework brings about a contrast in tonal color between sharp keys and flat keys. This is Mahler's most commonly employed method of tonal extension, and an extension practice of traditional harmonic function frequently adopted by twentieth-century composers—the mixed alternation of multiple tonal relationships to further expand the tonal range.

3.2. Composite harmony formed by pedal point and contrapuntal voices

In tonal music, the pedal point usually appears at the conclusion of a work; other voices may freely configure harmonies independently of it ^[6]. In classical sonata form, the “dominant preparation” in the bass before the coda is one such manifestation. In Mahler's music, the pedal point is often a harbinger of tonal fluctuation, or a common tone facilitating transition to a new key; thus, between the pedal point and contrapuntal voices, momentary dissonant sonorities frequently arise. The pedal of the preceding key is sustained into the voices of the new key, producing tonal superposition; as the new key is established, the dissonant composite harmony resolves to the tonic or dominant of the new key.

Figure 4 shows a typical harmonic heterogeneous juxtaposition produced by pedal point and contrapuntal voices, occurring in the introduction of the first movement, in a transitional passage that Floros termed a “Recitative” ^[5]. More than other harmonies, Mahler prolongs the tonic note, the dominant note, and the fourth-fifth interval through a variety of textural patterns, filling them in with one or more chromatically inflected linear voices that are markedly contrasting and relatively independent, thereby realizing a vertical harmonic heterogeneous juxtaposition of horizontal linear voices. The listener hears not a blended sonority but a layered one, in which the sustained pedal and the moving contrapuntal voices maintain their separate identities even as they sound together.



Figure 4. Example 4: Composite Harmony Formed by Pedal Point and Contrapuntal Voices, First Movement, Rehearsal Nos. 6–11.

4. Conclusion

The linear-developmental thinking in Mahler’s Third Symphony is embodied in the construction of themes and at various levels of musical structure. Through reduction and analysis of thematic-motivic and harmonic development, we find that linear-developmental thinking exerted the following influences upon the constitution of Mahler’s harmonic language:

The chord progression derived from the horizontal development of thematic-motivic voices is constructed on the basis of harmonic counterpoint. The continuity of thematic-motivic material and the structural prolongation of harmony are core manifestations of the linear voice-leading development principle. From this perspective, Mahler’s harmonic language is not constructed by stacked vertical sonorities, but by the interaction of independent horizontal lines, each of which bears part of the motivic, harmonic, and tonal logic of the entire work.

The entire work, centered on D minor, revolves around the fundamental harmony (I–V–I) through a series of embellishments in the submediant, mediant, and other directions, and returns to the parallel major (D major), forming an expansive tonal layout. The tonic’s hold across six movements and nearly a hundred minutes of music stands as the symphony’s most telling act of linear thinking. Throughout the work, recurring guiding sonorities—the tonic–dominant leap, the characteristic minor triad, the interval of the second—bind the tonal design into something coherent and rigorous, drawing on shared or near-identical pitch material. They function like a harmonic cantus firmus: present from first movement to last, transformed yet never absent, so that the listener hears one continuous trajectory rather than separate parts.

The pedal point is worked for all it is worth. Beyond smoothing the move to a new key as a common tone, it hides motivic figures and tonal centers inside its sustained line, deepening the harmonic prolongation. At once harmonic, linear, and formal, its flexibility lets Mahler’s orchestral writing sustain long, intricate arguments without coming apart.

In the end, the Third Symphony is a bold step rooted in linear harmonic development that reaches past the classical symphonic model. Themes and their transformations share a common identity, while the “prolongation of harmonic function”—built on the main key and its fourth- and fifth-related keys—holds the structure together. Mahler, standing at the turn of the century, renewed Classical-Romantic harmony through exactly this practice, showing that the deepest innovations extend inherited methods rather than discard them.

Disclosure statement

The author declares no conflict of interest.

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