

### On the Theory of Instrumentation

Carl Dahlhaus

The Oxford Handbook of Timbre

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### Abstract and Keywords

In this essay, originally published in 1985, Carl Dahlhaus addresses the problem of how to integrate timbre into our understanding of music while honoring its resistance to description and quantification. In particular, he explores the history of orchestration in terms of an opposition between “coloristic” and “structural instrumentation,” the latter defined as that which “actively intervenes in the compositional logic [*Tonsatz*] of the music, rather than being merely dependent on it.” Dahlhaus’ essay is grounded squarely in the common-practice era: his compositional points of reference span from Haydn to Richard Strauss, and he is particularly concerned with how instrumentation can reveal structural patterns that stand athwart the formal trajectories suggested by tonal analyses.

Keywords: orchestration, instrumentation, timbre, analysis, music theory, Carl Dahlhaus

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Wagner’s demand that one must take account of instrumentation in order to do justice to the modern harmony of the nineteenth century—that is, his own—has to this day not been met. We still lack even the outline of a unified theory of harmony and instrumentation, because the tendency toward abstraction, through which the theory of harmony proves itself as theory in the emphatic sense, prohibits or at least complicates linkages to other disciplines. Anyone who thinks they have reached the true goal of a harmonic analysis by explaining a  $II^6$  chord as an inversion of  $II$ , or the parallel subdominant as a variant of the subdominant—that is, by grounding the connections between chords in their tonal functions—misses the point entirely: namely, that such a grounding remains abstract, and that it is precisely the differentiation of chord inversions, which is neglected by functional analysis, that can constitute a means of forming a connection—a connection that can be clarified by instrumentation.

If the theory of instrumentation is to amount to more than a collection of aesthetic commentaries on coloristic effects—if it strives to be a genuine theory and not merely a book of recipes—then it must ultimately be able to mediate between harmony, counterpoint, meter, and syntax, and thereby to elucidate compositional structure as the concrete, coalescent outcome of reciprocal forces, rather than an accumulation of fragments from iso-

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lated, heterogeneous theoretical disciplines. Once one has recognized the necessity of grounding musical meter—the distinction between strong and weak beats—through the investigation of the shifting relationships between harmony and “metric weight,” instead of assuming a constant scheme of accented-unaccented (Moritz Hauptmann) or unaccented-accented (Hugo Riemann), it is no great stretch to look beyond harmony and include instrumentation as a decisive factor for an accent at the beginning of the metric unit (Hauptmann) or an emphasis on the end (Riemann)—that is, to gradually integrate the theory of instrumentation through a scholarly “patchwork technique” (Karl Popper) into a general theory of composition.

One of the obstacles to a historically differentiated theory of instrumentation is the ingrained notion of a strict hierarchy of musical properties and compositional dimensions that roughly correspond to them: pitch, comprising octave register and pitch class, serves, in the words of Jacques Handschin, as the “central” parameter, around which the “peripheral” aspects—duration, intensity, and timbre—are arrayed in hierarchical levels of significance.

Analyses that claim to find the real substance of a musical work in an abstract structure of pitches or intervals are generally viewed as thoroughly reasonable, while the attempt to deduce the internal coherence of a composition from the developing variation of an underlying rhythmic model would likely appear strange, and the notion of basing an analysis on a configuration of dynamic levels or distinctions of tone-color seems almost absurd.

The obvious corollary is to derive from a primarily pitch- or interval-oriented method of analysis a theory of rhythm as a secondary aspect of composition, which merely clarifies and supports the primary one. This conclusion was not, however, reached by Rudolph Réti, Hans Mersmann, or Heinrich Schenker, who were content simply to assume the primacy of pitch, as if it were self-evident, and to deliberately evade the resulting problem of explaining the peripheral and dependent character of the other aspects of compositional design. At the same time, they deliberately sidestepped the danger of being forced, through the predictable failure of such an effort, to surrender or revise their own premises.

The primacy of pitch and compositional design, which belongs to the unexamined assumptions of musical analysis, was by no means first challenged or subverted in the new music after 1945. Already in the classical-romantic repertoire, from which the notion of a “natural” hierarchy among musical parameters was derived, the reversal of this order—the sudden protrusion of the orchestral apparatus—was a familiar way of marking formal boundaries. The tutti that follows the eight-measure first theme in the first movement of the *Jupiter* Symphony, for example, which Hans Georg Nägeli saw as “trivial,” is motivically empty and harmonically meager, apart from its continually accelerating harmonic rhythm. Its aesthetic justification lies in assumption that the symphonic style has to manifest not only themes, but also the orchestra itself—whether all at once or little by little with its various timbres. (In the *Jupiter* Symphony it is the sudden intrusion of the tutti, in Beethoven’s Ninth a gradually growing cast of colors, which is to be perceived as a self-

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sufficient, structural musical dimension—not as the mere presentation of motives.) Prejudiced by classicist habits of thought, Nägeli could not grasp that the dynamic and orchestral unfolding in these tutti passages is less a function of the compositional structure than the structure is a function of the dynamic and orchestral unfolding.

The introduction to the finale of Berlioz's *Symphonie fantastique*, "Songe d'une nuit du sabbat," can be seen as a "determinate negation" of the aforementioned tutti in the *Jupiter* symphony, insofar as deformed sounds appear as the timbral correlate of tonal uncertainty—again assuming, in order to justify the comparison, that compositional technique is a function of orchestral effect. The more unusual and striking the instrumentation—and the more unmoored and structurally weaker the harmonies—the more apparent it becomes that the compositional structure is dependent on the instrumentation. Even taking into account the fact that this passage is a slow introduction, whose structure is motivated by the goal to which it leads—the series of diminished seventh chords (mm. 1–4: A sharp–C sharp–E–G, mm. 6–10: F sharp–A–C–E flat, mm. 12–15: B–D–F–A flat) alternating with triads that, according to harmonic theory, cannot follow these seventh chords (m. 5: C major, m. 11: C major, m. 16: A-flat major)—this music hardly meets the requirements of composition in the accepted sense of the word. These "vagrant chords," as Arnold Schoenberg would call them, instead constitute the mere substrate of an instrumentation whose noisiness predominates to an extent that could hardly be justified in conjunction with unambiguously tonal harmonies, because the instrumentation would obscure the harmonic logic. The combination of muted tremolos in the *divisi* violins and violas with the third in the timpani, or the chromatically descending diminished seventh chords in the flittering string tremolos would undermine the sense of tonality, even if the harmonies were stable; thus it seems fitting that they are not. Of course, one could trace the tonal uncertainty to the introductory function of the *Larghetto*, and the noisy instrumentation, in turn, from the tonal uncertainty. It seems more likely, however, that Berlioz began with the intuition of a programmatically grounded deformation of sound, for which the vagrant harmonies, and their weird relationships to the interpolated triads, seemed an appropriate tonal substrate. Compositional structure, or the lack thereof, is revealed as the function of a timbral deformation that obscures whatever structure there is.

Just because the ingrained notion of a strict hierarchy of compositional properties must be qualified and occasionally suspended, it does not follow that the hierarchical model, which is the foundation of some of the most enlightening and nuanced analytical methods, represents a mere fiction or misguided prejudice. On the contrary, a substantial portion of the classical-romantic repertoire can be quite sensibly analyzed according to the principle that Jacques Handschin expressed, with admirable simplicity, as the distinction between central and peripheral musical properties. The analysis of instrumentation, however, in order to avoid foreclosing access to works or passages that are structured in different ways, should in principle leave open the possibility that the hierarchy can be modified or even inverted, without justifying negative judgments such as Nägeli's. The pitch-centered hierarchy is not a normative model, enthroned above history, but rather historically conditioned, and thus mutable.

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The customary opposition of coloristic and structural instrumentation is hardly useless as the starting point of a theory concerned with historical differentiation. This opposition is inadequate, however, insofar as it leaves unresolved the question of whether the term “structural” means a use of the orchestra that undergirds the compositional structure, or one that merely clarifies it—that is, whether instrumentation should be seen as essential or merely incidental.

Structural [*strukturbildende*] instrumentation, defined as that which actively intervenes in the compositional logic of the music, rather than being merely dependent on it, was no less influential than the coloristic approach typical of the nineteenth century, which was largely inspired by programmatic leanings. It contributed to the progressive emancipation of timbre, a process that led from the *ad libitum* instrumentation of the sixteenth century to the *Klangkomposition* of the 1960s—that is, from the pre-history to the post-history of instrumentation, from “not yet” to “no longer.”

It is no exaggeration to speak of the structural or essential role of instrumentation with regard to the *durchbrochene Arbeit* recognized by Guido Adler and Hugo Riemann as characteristic of classical techniques of orchestral writing. The change of instrumentation after every three tones, which makes the second theme of the first movement of the *Eroica* a paradigm of *durchbrochene Arbeit*, can hardly be seen as an after-the-fact clarification of a “given” melodic arrangement; instead, the motivic complex, in which the rhythmic symmetry and pitch substructure (F–E–E flat–D) form the counterparts to a rather fragmentary melodic surface, is scarcely imaginable apart from the shifting timbres, which provide aesthetic justification for both the rhythmic formulas and the discontinuity of the melody. The instrumentation is not secondary, but rather—at least in a logical sense, and probably also in terms of composition—coeval with the motivic structure.

While the timbral variation and the melodic articulation of Beethoven’s theme are connected in such a way that one cannot sensibly speak of the primacy of one or the other, the constitutive, compositionally determinative significance of instrumentation—which was seen as a usurpation by classical aestheticians—emerges most blatantly when it comes into conflict with ingrained principles or prejudices, such as the notion that the presence of polyphony forces instrumentation and color into a subordinate role. The “polyphonizing” voices in the orchestral works of Richard Strauss have always been prey to the distrust of theorists, who consciously or not based their judgments on the assumptions of classical aesthetics. (The pejorative phrase “polyphonizing” was meant to suggest that here polyphony was only faked.) That the secondary voices were furnished with an expressive-melodic character that projected the characteristic tone of a viola or a horn, rather than the melodies themselves, appeared to Strauss’ critics as an inversion of the “natural” means-ends relationship, in which color is a function—a dependent variable—of the melodic-polyphonic line, rather than the line being a function of the color.

Although a similar inversion of the traditional hierarchy of color and line could be observed in painting of the early twentieth century, this did nothing to convince academic critics of the legitimacy of using memorable, expressive melodies to highlight particular

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tone-colors. These critics' dogmatic notion of a strict ranking of compositional elements was likely based on the conviction that instruments cannot truly come into their own in timbral terms until they "have something to say" in a melodic sense, rather than simply making themselves noticed through sheer volume.

The reconstruction of unspoken assumptions that have congealed into apparently self-evident truths—the search for the historical implications summed up by what is known as the "horizon of expectations" in the aesthetics of reception—is especially urgent in the case of instrumentation, since here the "contents" are often ambivalent. This task is difficult, however, because the historical psychology on which such an effort would rely belongs to the divisive disciplines in which one can never quite tell whether its undeveloped condition represents a challenge to energetic scholarly efforts or, on the contrary, a sign that the undertaking was found to be in vain and thus tacitly abandoned.

To take one example, consider the fact that octave doubling between the violin and bassoon is unremarkable, while that between the oboe and cello stands out as a striking and characteristic timbre. This cannot be satisfactorily explained by a music psychology that seeks to grasp the "natural givens" of hearing; it must therefore be interpreted in part by revisiting the history of instrumentation. (Here we risk becoming ensnared in the lively controversy between anthropologists, who believe in a definite nature of music, and historicists, who deny it. We can bypass this danger by conceiving the contested anthropological constants as structures of *longue durée*, in the sense of Fernand Braudel, and thereby posing the empirically verifiable question of how far back in time the origins of a phenomenon lie, instead of continuing the endless metaphysical debate over the basic difference between that which is naturally given and unchanging, and that which is historically emergent, and thus changeable.)

There is a well-established custom of perceiving the strings as the "ground" (in the sense of gestalt psychology) and the winds as the "figure," as long as the compositional structure does not force an inversion of this pattern, as when sustained chords in the winds are combined with active string motives. This is a listening convention that surely emerged in the eighteenth century, though it cannot easily be dated with precision: it is an open question whether the strings in the time of Haydn had already been neutralized to a primary color whose timbral quality was hardly perceived, and which thus appeared suited only to outline the compositional structure in "lines" rather than in "colors." However, supported by the hermeneutic axiom that the more sophisticated reading is the more convincing, we can proceed on the assumption that in a Haydn symphony the relationship between sustained winds and motivically active strings can be understood as a tension between two distinct figure-ground relationships, one involving compositional technique and the other instrumentation. This means taking for granted the neutralization of the strings as an unremarkable, "normal" primary color—not because this can be demonstrated or made plausible on the basis of historical psychology, but rather because it enables a more sophisticated interpretation in aesthetic and compositional terms.

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A similar difficulty emerges in Haydn's earlier symphony *Le midi* (1761), a programmatic work related to the genre of the *symphonie concertante* in both compositional technique and instrumentation. In the second theme of the first movement (mm. 42–48), the string unison is, historically or genetically speaking, a re-orchestration of the bassoon voice in the French wind trio (two oboes and one bassoon); in structural and aesthetic terms, however, the bassoon is an addition to the string unison, which exchanges contrasting motives with the oboes every other measure. The question of the historical reality of listening, with which historical psychology would have to wrestle, is made acute but not resolved by the distinction between the genetic and the structural dimensions. This question becomes yet more complicated in light of the fact that a historian is hard-pressed to say to what extent, in 1761, the late-Baroque wind trio was “still” conceived in timbral terms and pre-classical string writing “already” subject to the neutralization of tone-color into something inconspicuous and self-evident.

The convention of hearing string parts in orchestral scores more as line than as color was sporadically broken by Berlioz, Mendelssohn, and Wagner in works such as the “Queen Mab” scherzo, the overture to *A Midsummer Night's Dream*, the *Lohengrin* prelude, the “Feuerzauber” and the “Waldweben,” but only definitively transcended by Debussy and Ravel. This convention was probably fostered by the coexistence of the string quartet, whose aesthetic excluded or frowned upon coloristic effects, although these could not be entirely suppressed in compositional practice. The techniques and aesthetics of instrumentation in one genre are not independent of those in other genres, even those seemingly far-removed, and this is a good reason to avoid dubiously confining the concept of instrumentation to orchestral compositions. The problematic interdependence between abstract compositional structure and scoring in a piano trio is neither less serious nor fundamentally different than in a symphony.

The search for the historical causes underlying changes in the perception of timbre, if it is to avoid succumbing to arbitrary hypothesizing, must be extended by a systematic reflection that indicates general constraints and marks boundaries. The fact that the timbre of strings, until its final emancipation by Debussy and Ravel, was for a century largely neutralized in such a way that its coloristic quality was scarcely noticed—it doubtless “exists” even in a compositional language in which this quality is not permitted to stand out in its own right—demonstrates emphatically that the “real” in music is nothing but an assemblage of possibilities that are realized (or not) in the aesthetic object—an “intentional” object that is not passively taken in, but rather constituted in the first place by the perceptual categories through which it is filtered.

Without recourse to the concept of intentionality in its phenomenological sense, many of the historical changes in the perception of timbre remain all but inscrutable. Only by taking seriously the aesthetic premises of musical techniques—even those that are seemingly speculative and metaphorical—can we make sense of the fact that in German orchestral writing of the classical-romantic period the mixing of colors was perceived as a “de-individualization,” while Franz Schreker, in the historical situation of the early twentieth century, saw mixed timbres as the only means of achieving novel and unexpected coloris-

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tic effects. Whoever interprets, like Adolf Bernhard Marx, the individual instrument as a “character” in the “cast” of the orchestra, and a symphony as a “dramatic plot” of supporting and opposing actions, will tend to associate the concept of musical color primarily with unmixed timbres. This is in accord with the instrumentation of German music in the early nineteenth century, which sought “characteristic” effects in striking wind timbres or in the unwieldy juxtapositions of different orchestral colors. On the other hand, if one sees musical color in analogy to color in painting, it is logical to seek the peculiar in the deviation from the general and familiar—that is, in unexpected mixtures instead of the existing instrumental timbres of the orchestra. (Marx called the method of mixing and, as it were, composing timbres, which he observed in the music of Berlioz, “subjective” and “materialistic,” and the opposite approach—to accept timbres as natural givens and respect their purity—“objective” and “idealistic”: “idealistic” because this approach accentuated the melodic-polyphonic musical idea, instead of the “material” coloristic effect. Instrumentation thus fulfills its function most perfectly when it obscures the art that it is, and instead strives to appear as nature.)

A satisfactory interpretation of the orchestral polyphony of the eighteenth to twentieth centuries has been hindered by a prejudice rooted in a historically inaccurate understanding of counterpoint. (This symphonic-polyphonic writing was seen by Adolf Bernhard Marx as the counterpart to the dramatic-homophonic polyphony for whose development Richard Strauss gave credit to Richard Wagner and himself.) The notion that “true” polyphony required all voices to be equivalent, equally sharing the melodic or thematic material, limited the category of counterpoint to the strict imitation of the canon and the fugue—that is, to an extremely small part of the history of polyphonic composition.

To judge orchestral polyphony by the improper standards of a strictly fugal notion of counterpoint is not merely to proceed on normative, ahistorical grounds; it is to distort the very tradition that one claims to uphold. Even in the counterpoint of Bach—theory’s court of appeal—the characteristic texture is not so much that of the fugue, but rather a style of polyphony with functionally differentiated voices typical of the concerto grosso. It would be absurd to call a composition consisting of distinct, hierarchically differentiated “layers”—in Bach’s arias, an expressive, declamatory vocal line, a motivic-figurative instrumental part, a basso continuo, and a harmonic background—anything other than polyphonic, and this is all the more as the concertante style is the form of polyphony that corresponds most precisely to Bach’s place in the history of composition.

To distinguish between the “polyphony” of equal voices and the “counterpoint” of functionally differentiated voices, as was customary among Schoenberg and his students, is unhelpful insofar as it runs counter to the colloquial opposition between counterpoint as a technique and polyphony as a result or the underlying principle.

In a history of counterpoint that highlighted the practice of functional differentiation—as well as the dialectic of equality and functional differentiation found in many other eras—the orchestral polyphony of the eighteenth to twentieth centuries would finally find a place commensurate to that of the *durchbrochene Arbeit* that Guido Adler and Hugo Rie-

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mann identified as typical of orchestral composition in the classical era. *Durchbrochene Arbeit*, whose name alludes to Gothic architecture, shares the differentiation of voices with the concertante style from which it emerged, but is distinguished from the tradition of the seventeenth and early eighteenth centuries in that the voices are broken up and occasionally even ruptured by breaks and motivic oppositions. The timbral manifestation of the music's successive and simultaneous contrasts creates an alternation of instruments and colors that was originally perceived as confusingly variegated, leading critics to reproach the symphonic style as "rhapsodic."

Still, as already mentioned, the meaning of classical-romantic orchestral polyphony would be grossly misunderstood if the alternation of timbres were seen as nothing but the mere façade of the compositional structure. This timbral variety is rather—to put it bluntly—the condition of possibility for a form of composition that is scarcely conceivable in the abstract, without recourse to the orchestral apparatus. The motives' ability to contrast with each other both simultaneously and successively and yet appear as a cohesive whole is grounded in the instruments' oppositions, gradations, modifications, mixtures, and groupings, which constitute a timbral nexus whose analysis is every bit as necessary—and every bit as difficult—as the analysis of a color nexus in painting.

Take, for example, the last three measures before the reprise of the first theme in the *Andante* of Mozart's Symphony No. 40 in G minor, where the *cantabile* woodwind motive (which sharply contrasts with a broken string figure passed every other half-measure between cello and first violin) appears first in the flute, then in the oboe, and finally in the flute, oboe, and bassoon. Here it is a case, on the one hand, of an intensification that corresponds to the goal-directed character of the retransition, and on the other hand of a shift of emphasis within the compositional structure, through which the even eighth-note rhythm of the woodwinds gradually moves to the forefront, in anticipation of the rhythm of the returning first theme. But the connection between formal function, compositional structure, and instrumentation would be too crudely rendered if one were to speak simply of an escalation typical of retransition passages, which manifests itself in the instrumentation (increased intensity) as well as in the dominant harmonic progression (C<sup>7</sup>-F<sup>7</sup>-B-flat<sup>7</sup>) and in the chord structure (greater number of tones). Rather, the decisive factor is the way the timbral changes in the woodwinds function not only to emphasize phrase structure, but also to make the motivic disposition possible in the first place. The instrumentation is not a retrospective coloration of the *durchbrochene Arbeit*; it is a constitutive feature of that idiom.

In order to analytically demonstrate the claim that instrumentation is essential, rather than incidental, one must recognize that the categories used to interpret motivic connections are interpreted can be applied to timbral relationships, though not necessarily without qualification. Connections between instrumental colors can by all means be identified with concepts such as variation, complementarity, and sheer difference, and it is no vague or meaningless metaphor to see the succession of flute and oboe in the above-mentioned



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passage from Mozart's Symphony No. 40 as every bit as much of a sequence as the motivic structure to which it corresponds.

Distinguishing between two forms of difference—contrast and divergence—means giving a precise meaning to symbols such as “A” and “B,” which, left uninterpreted, constitute the blind spot of so many analyses. A connection forged by contrast represents the polar opposite of disconnected difference. This distinction is in any event more difficult in the case of timbres than in the case of motives, because instrumental colors lack an equivalent to the connective effect of harmony, which forms links between opposed motives. (Unless, that is, one were determined to satisfy Wagner's demand to link instrumentation to harmony and motive by seeking in these other parameters the reasons why a given contrast of timbre appears either complementary or abruptly heterogeneous.) When, in the second theme of the first movement of Beethoven's Symphony No. 1 in C major, op. 21, the measure-by-measure alteration of the timbres oboe-flute-oboe-flute corresponds to the motivic variants  $a^1-a^1-a^2-a^2$  and the harmonic progression I-V-V-I, there is accordingly no reason to see the relation between the various compositional planes—their partial contradictoriness—any differently than in a period, whose internal coherence results from the tension between motivic analogy (a-b-a-b) and harmonic inversion (I-V-V-I), as for example in the beginning of Mozart's “Jupiter” Symphony. Instrumentation takes part in the dialectic of parallelism and opposition no less than motives and harmonies, and there are no grounds for dismissing it as a subordinate or secondary aspect of composition. Rather than merely clarifying and coloring the structure of orchestral music, it constitutes this structure. And if instrumentation is not always a central parameter, it would nonetheless be a mistake to dismiss it as merely peripheral.

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### **Carl Dahlhaus**

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