

The *Tristan* Progression as an Energetic Voice-Leading Paradigm: A Study in *Kinetic Displacement Intervals* (KDIs)

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I. Introduction

Let's begin with some music. On the screen (and also on your handout) is a brief passage from Act III of *Tristan*, one that marks the end of the hero's first death-seeking psychotic episode, and his realization that it is Isolde, from a distance, who prevents him from returning to the kingdom of eternal night. Let's listen. [PLAY] As an analyst, what does one say about music like this? If our tools are calibrated for the common practice, we quickly come to an impasse; we won't find much in the way of triadic prolongations or functional syntax. And yet the excerpt's underlying mechanics are, in many ways, perfectly easy to hear. This reduction makes it especially clear that from bar 3 onward, the orchestra occupies itself with a creeping, and yet implacable, chromatic descent. Red notes here show voices that have just inched downward by semitone (or, in exactly one case, by whole step). This is clear to see even before we assign the chords names—though the latter help to bring out aspects of the music's sequential patterning.

By contrast, the vocal melody mounts a series of decisive thrusts in the opposite direction, taking the form of a long-range ascent. Though these would-be diatonic lines are bent by the harmonies into octatonic segments, the upper voice largely resists the downward-pulling chordal stratum. Thus the music hangs suspended between two conflicted energetic impulses—between the sinking inertia of its harmonic layer and the upward striving of the vocal part. These gestural tensions map readily onto the psychodynamic processes of the stage drama. *With Tristan*, the vocal line literally reaches out to “Isolde” (the melody's highest pitch), even while the enervated harmonic stratum pulls ever lower, threatening to extinguish itself, and the light of Tristan's consciousness with it.

Complexes like this are common in Tristan—those that pit melody and harmony against each another in a kinetic “contrary motion.” And it’s this principle that I will explore in some detail today. In the time we have, I’d like to spin out as far as possible the key insight glimpsed in this analytic vignette—that there are worthy questions to ask about Wagner’s idiom that focus on the intersection of voice-leading, gesture, and stage action, without a nomenclature—or even a concern—for specific harmonic/syntactic relationships. Our experiment today will be to ask what might be gained by bracketing questions of chord identity and structure, to focus instead on the voice-leading that produces and interconnects them.

This manner of listening owes no small debt to Ernst Kurth, whose imaginative and iconoclastic ideas about Wagnerian harmony are highly regarded, but have made relatively little impact on nuts-and-bolts analysis. In some regards this only natural: Kurth’s energetic image of Wagner’s music—a surging tissue of “volitional impulses,” “psychic energies,” and “force waves”—is more metaphorical and metaphysical than technical. Like his contemporary Schenker, Kurth rejected the ponderous chord-by-chord analyses of his time, proposing that vertical sonorities are only the byproducts of forward-driving “melodic energies.” But unlike Schenker, whose energetic model grounds itself in the bedrock of strict counterpoint, Kurth’s energies are not principally *musical* at all: they are the *projections* of psychic forces originating within *human subjects*. Today’s paper proposes one way that we can realize these two key principles—the deprivileging of “vertical” harmony and the homology of musical gesture and psychodynamic processes—in a more disciplined analytic idiom.

II. Kinetic Displacement Intervals

I’d like to start our theoretic discussion with an important caveat. It strikes me that the main challenge for any theory of musical energetics is, ironically, the very fact that makes such theories so appealing: namely, that music is so comprehensively and fundamentally energetic—that we hear its energies manifested not in any one domain, but in many or indeed most of them. Music’s energies are unruly and difficult to theorize precisely because they are *emergent* qualities,

involving meter, register, tempo, timbre, harmony, melody, and gesture. Now this is not to say we can't profitably isolate individual parameters, or a small subset of parameters. But it's important to remember that such inquiries inevitably give only one of many possible perspectives on an intricate and multidimensional phenomenon.

With that said, the parameter I'd like to isolate today is voice-leading. Very broadly, I am concerned with how we can hear motion between tertian sonorities as “kinetically” motivated. To this end, I'll identify two types of “voice-leading kinesis.” The first is *gestural voice-leading kinesis*: the rhythmic motion of actual, sounding voices through pitch space, with the latter serving as a vectoral field that allows us to hear music manifesting a familiar kind of “virtual physics”—exhibiting “momentum,” succumbing to “gravity,” and so forth. The second type is what I call *efficient voice-leading kinesis*, which combines concepts from pitch and pitch-class space. It is pitch-class based in that it calculates voice-leading abstractly, in terms of parsimonious motion. But it incorporates pitch-space conceits by assigning these motions an energetic valence based on the polarity between “up” and “down.” The basic unit of measurement here is the *kinetic displacement interval*, or KDI, which gauges the kind and intensity of voice-leading displacement from one tertian verticality to another. (And I should mention that the KDIs are called “intervals” because they were developed within a transformational framework; but that's not the direction I want to go with them today.)

So first the question of how to determine a KDI. I'm going to run through the definition very quickly and then walk carefully through a few examples. To find the KDI of any same-cardinality chord pair, one first determines what Richard Cohn calls its *directed voice-leading sum* (or “DVLS”). To do this, we find the “sum” of each collection by adding its pitch-class integers, mod 12. To get the DVLS for a given progression, we subtract the sum of the first chord from that of the second (again, mod 12), producing a range of results from 0 to 11. The final step is an orthographic conversion. If the DVLS is between 1 and 5, we add a “positive” valence, and that is our KDI. If it's between 7 and 11, the KDI is the mod-12 complement with a negative valence

assigned. So from this conversion chart, we see that a DVLS of {5} becomes a KDI “+5,” but {7} becomes {-5}, and so on.

Let’s run through all that again with an example, using a C-sharp diminished-seventh and an A half-diminished. [PLAY] We first need to find the sums of the two chords. So starting on the left, we have to add up the chord’s pitch-class integers, which gives us $22 \dots \text{mod} 12$ makes for a sum of {10}. The same procedure for the right-hand chord returns a sum of {7}. Next we get the DVLS by subtracting sum 1 from sum 2, so that’s seven minus ten, mod 12, equals *nine*. And lastly, we remember our conversion chart, which tells us that a DVLS of 9 converts to a KDI of *negative three*. And this “negative three” KDI tells us what we can see here with the naked eye: that under efficient conditions, three of the voices move “downward” by semitone.

Before delving into what the KDIs *mean*, let’s pull up several additional examples. The progression at (a) is the one we just talked about. At (b), we see two tetrachords that both have the *same sum*, meaning they have a KDI of *zero*. Finally, at (c), I show a progression with a KDI of +2. With this fuller array, we can see more clearly what the KDIs model in terms of basic voice-leading mechanics. KDIs indicate the total semitonal displacement from the first chord to the second, with one critical caveat: equal moves in *opposite* directions “cancel one another out” rather than accumulate. This is especially clear at (b), where two moves—{+1} and {-1}—result in a KDI of {0}. [CLICK] The orthography of the KDIs—their assignment of a positive or negative valence—allows them to characterize the *contour* of their voice-leading under efficient conditions: a negative KDI indicates motion that is predominantly “downward,” while a positive value indicates “upward” voice-leading.

So now, more importantly, let’s talk about what the KDIs aim to convey. The KDIs strive specifically to model the “stepwise” interval classes (ic ⟨1⟩ and ⟨2⟩) as *kinetic linear-pairs*—pitch-class pairs bearing an idealized melodic contour, some trace of essential “up- or downness.” This entails freighting them with a certain amount of subjective or psycho-auditive baggage. Today, I’m interested in exploring how, under ideal conditions, KDI progression-types might be heard to bear specific *qualitative* attributes. To get the ball rolling, I’d like to posit, following from certain

familiar psychoacoustic associations, that “negative”-KDI progressions can be heard as “tension-releasing,” while their positive-KDI counterparts might be heard as generically “tension-increasing.” Now by tension I don’t mean an immanent, acoustic property—the KDIs don’t comment on consonance or dissonance. Rather, what I mean to capture here is the energetic profile that arises *relationally* and *contextually* between two chords. We might also express this in terms of stability: all else being equal, a negative KDI might create the impression of moving from a *less* to a *more* “stable” state. And vice versa: a positive KDI progression might give rise to an emergent sense of *decreased* stability. Maybe you’ll hear these qualities if we listen to progressions (a) and (c) in parallel. [PLAY/PLAY] In this same framework, we might hear a KDI of {0} as “tension-neutral” or embodying “motion” within a kind of energetic “stasis.” [PLAY]

So I would stress again that the purpose of KDIs isn’t simply to *tally* voice-leading “work”—after all, we can have a bunch of voices moving and still turn up a KDI of {0}. Rather, their function is to model the dynamic *totality* of a voice-leading gesture. They encourage us to conceive of ic-⟨1⟩ motions as discrete “quanta” of energy that appear in one of two opposite forms (ascending and descending), which “average out” to a single kinetic vector in chord-to-chord motion.

Now this “qualitative” dimension marries pitch- and pitch-class concepts in a way that might justifiably set off some alarms. It is one thing to hear pitch-classes embodying aspects of diatonic adjacency—the ability to displace one another “by step.” (Schenkerians do this all the time.) It is quite another to generalize the qualitative, spatio-kinetic attributes of adjacent *pitches* to pitch *classes*. In this case context is everything. A single KDI may have little or no analytic purchase in isolation. These directional qualities and “tension fluctuations” are probably most detectable when they occur within a broader *energetic voice-leading gestalt*, a long-range kinetic impulse involving a succession of harmonies and often a coordination of gestural- and pitch-class kinesis.

Before we finally get back to real music, we might pause here to look at a few energetic voice-leading gestalts. In most of these examples, I will take a single pitch-class configuration—

diminished-seventh tetrachords proceeding by T11—and project it into pitch space in a variety of ways, creating a number of distinct energetic gestalts. Now because the pitch-*class* relations are the same in each of these cases, so are the KDIs: each of the diminished-seventh progressions we’ll have has a KDI of {-4}, meaning that the “efficient” voice-leading tends downward continuously through each example, *even though* the music sometimes moves “upward” in pitch space. So the question is, how valid or perceptually relevant are the negative KDIs when they contradict the pitch-space motion? In Example 1, the pitch-space distribution realizes this downward voice-leading in all but one of its chord pairs—the exception being indicated here in red. So the overall gestalt is a descending one, and it gives us the context and the incentive to hear a “smooth” voice-leading connection across the single anomalous break in the pattern. We may, in other words, be inclined to hear a *continuous voice-leading descent*, despite the registral disjunction. [PLAY]

Example 2 presents a more equivocal case. Here the chords zigzag through pitch space, with two semitone “downshifts” followed by a single whole-step “upshift” (again shown in red). But because of the chord structure, the “upshift” moves actually yield three *lower* semitone neighbors to the preceding chord. That is, when the A diminished seventh moves to the B diminished seventh, *three* of the tones can be heard to move “downward” by semitone. So it would be possible, even despite a predominantly “horizontal” gestalt, to hear a (quote-unquote) “continuous descent” here as well—an elegant shepherd-tone-effect in which voices appear to cascade downward, despite their own registral fixity. This is a trick that could be pulled off with the right kind of orchestration; even a clumsy “orchestration” in Sibelius helps us hear it [PLAY].

Now we might hear more or less the *opposite* effect in the familiar progression known as the “omnibus.” (And this requires us to put our diminished sevenths aside for a moment...) Here, despite a dynamic wedge-shaped voice leading, the uniformly neutral KDIs reflect what we might hear as a kinetic holding pattern: this is tense harmony, to be sure, but the tension that finds neither increase nor outlet. [PLAY] My hearing is of a progression that simply hovers around its own center, one sonority morphing into the next. And I say this despite the fact that the sonorities themselves are not all equally tense in the acoustic sense. Every third chord is a triad, not a

dominant. In theory, KDIs allow us to mix triads and seventh chords—provided that the triads are realized in four voices. Though in most cases, the differential of acoustic tension normally overrides any apperceptible effect of voice-leading kinesis; seventh chords will just tend to sound inherently “tenser” because of their intervallic makeup. But here, for me at least, these differences are blurred out by the progression’s more salient gestural/kinetic aspects.

Finally, moving back to our diminished sevenths, I offer for contrast Example 4, which works strenuously *against* the putatively “downward” voice-leading implied by the KDIs. [PLAY] In cases like this, the KDIs offer little in the way of insight.

Now obviously, real music only rarely presents voice-leading gestalts as straightforward as these: though we have already seen one today, in the passage I discussed at the opening. Here is the analysis with KDIs added. And here, of course, they don’t tell us a whole lot that we didn’t already know, since the voice-leading is efficient *in pitch space*. But now we’ll turn to the opening progression of *Tristan*, where the KDIs will allow us to make some subtler observations about a notoriously intractable set of harmonic events.

III. The Tristan Progression

The celebrated “Tristan” progression embodies the energetic voice-leading complex I discussed in our first example: one that conjoins upward melodic “striving” with harmonic “sinking.” This complex, which I call the “yearning/negation” paradigm, is especially resonant with *Tristan*’s central psychodramatic trope: an inflamed desire that at the same time is a will to inertia and nonexistence.

The progression’s rising component is clear enough. Of course the opening leap of a sixth is the attention grabber, but the more salient ascent begins on the G-sharp in bar 2, which sets into motion a chromatic ascent that binds the prelude’s entire opening paragraph, and which culminates with the resolution to A-natural sixteen bars later and a minor ninth higher. As for the harmonies, we see that the main sonorities relate by a KDI of {-2}, suggesting a mildly tension-discharging progression—one that would find the E dominant chord more relatively stable than its

predecessor. But unlike the didactic examples in the previous section, the *harmonic* and the *linear* here are not so crisply separated. For instance, the top-voice chromatic ascent disappears in the chord-to-chord reduction, since it effects a voice-exchange between *common tones*: G-sharp and B.

But what is really striking is that if we aim to factor that rising line into our analysis by analyzing the KDI not between the endpoints but on either side of the barline—at the moment the first chord discharges into the next—we actually find a much *stronger* “tension-releasing” KDI of {-4}. This purely relational perspective on tension and stability brings us to a hearing that is curiously similar to Kurth’s own. Unusually for his time, Kurth aimed to construe this E-dominant sonority as a kind of “consonance,” a chord of quasi-cadential *resolution*. Here, without any conceptual sleight of hand, I’ve posited much the same: not that the E-dominant is *acoustically* consonant, but rather that in context it serves as a point of repose, overriding its putative “instability” as a functional chord in A.

As you all know, bars 5-7 transpose this music by a minor third. But the *third* Tristan chord (beginning in bar 8) resolves differently, and yields a very distinct kinetic profile. Now between the main sonorities we find a “tension-*building*” KDI of {+2}. The “over-the-barline” KDI has also changed. Compared to the precipitous {-4} descent of the first progression, we now find a more equivocal KDI of {0}, which I’ll talk about more in a moment.

Here again we find unexpected parallels with Kurth’s hearing. Lee Rothfarb points out that this progression has inspired even more convoluted explanations than the last one; analysts have saddled this “Tristan” chord with roots of A, B, D, and E. Kurth himself chose the last of these, as part of his effort to hear the progression as a “reversal” of the opening one. He heard bars 2-3 as a “falling fifth” progression and this one as a “rising fifth” progression with the *same* roots. A KDI analysis posits a similarly “reciprocal” relationship—one being -2 the other being +2—but without having to fudge the pitch-class data as Kurth does. I like to imagine that when Kurth posits these roots, he is most interested in the normative energetics of the root-progressions themselves, which harmonize nicely with the KDI reading—falling-fifth motions typically being

heard as “cadential” or “stability-increasing” and rising-fifth progressions often being heard as destabilizing or open-ended.

These two progressions, with their inverse kinetic profiles, are the anchors of a broader “kinetic narrative” that spans the prelude’s first seventeen bars. In this narrative, the upward-reaching “yearning” impulse resists and eventually overpowers the abnegatory force of the descending chromatic voice-leading. Let’s walk through it. As we know, the opening Tristan progression establishes a strong tension between a melodic pitch-space ascent, with what is actually *called* the “yearning” motive, and a strongly downward-tending harmonic impulse. [PLAY] Bars 5-7 recycle the opening gesture a third higher. The upper voice continues its bootstrap chromatic ascent, despite the dead weight of the inert harmony. [PLAY] But in the third sequence, the “yearning” motive extends to a fifth semitone, necessitating a different kind of harmonic resolution: this is the second progression we looked at earlier, one that reverses the energetic trajectory of the first. The extended “yearning” motive doesn’t simply pull the music higher in pitch space, it also changes the energetic orientation of the harmonic processes underneath. [PLAY]

And yet it is still not enough: as we saw, the over-the-barline voice-leading is a KDI of {0} suggesting an expensive drain of voice-leading energy that amounts, more or less, to standing still. Again, there is a mechanical effort to hoist the music higher in pitch space. [PLAY] It is only when the upper line sheds the cumbersome harmony altogether that it is able to consummate this insatiable upward thrust; here the passage distills to the iconic representation of striving, the single rising semitone. [PLAY] It is at that moment that the E-seventh chord from bar 3 returns, now bearing the tonal value of a real dominant, and it is here that the music finally overcomes the harmonic malaise of the opening 16 bars. Not only does this burst of functional harmony move the music into a new, more stable diatonic space, the deceptive resolution of E⁷ at last finds the voices converging *into* one another, rather than moving apart. [PLAY] At last, we can hear a tension-depleting {-2} discharge as the *culmination* of a process, rather than as an impediment to forward motion.

IV. The Paradigm in Other Contexts

This reading of the prelude suggests to me that Kinetic Displacement Intervals would be most analytically beneficial as means of incorporating harmonic voice-leading into in broader theory or typology of Wagnerian gesture. Such a typology might include simple elements, like the “yearning/negation” paradigm I discussed earlier. It might also identify more complex, multisectional energetic paradigms. To close, I’d like to look at an excerpt from Act III—one that in its broadest energetic outlines reinstates the gestural envelope of the prelude’s opening sixteen bars. The passage in question is on the reverse side of your handout. And I’d like to start by listening to it; you can scan the boxed annotations as you go. [PLAY] The three boxed annotations trace the gestural envelope I hear echoing that of the prelude. Beginning in the second bar, the music locks into the yearning/negation paradigm: Tristan’s fever-driven delusions push the vocal line into ever more precarious tessituras (F, then G, then A-flat), while the slower-moving harmonic stratum effects a series of negative-KDI progressions: -4, then -3, then -5. Then, a reversal: as in the prelude, the kinetic profile tilts in the favor of the upward-striving yearning impulse. The reversal first appears as a positive KDI move (here +3 at the introduction of the E-flat dominant) and then, more obviously, in a decisive upward pitch-space thrust—one that, as in the prelude, seems to shed the bassline entirely. (Here, as a string of parallel diminished seventh chords.)

And like the prelude, the passage culminates in a rhetorically spotlighted dominant seventh chord. But where the prelude’s dominant found its consummation, here we are left hanging. The bottom literally drops out on Tristan’s delusion; in a striking perspective-shift (right at the beginning of the third system), Wagner shows the E-flat dominant to be Tristan’s fantasy, and the B-flat pedal that anchored it nothing more than the sound of the empty sea, a functional tone in the desolate F minor landscape of Kareol. And there is a terrifying palimpsest here as well: the harmonic progression as a whole is precisely the one that sounds in Act II at the very moment

Isolde joins Tristan in the famous duet “O sink hernieder.” So let’s listen to that Act II passage, and then the Act III one once more. {PLAY/PLAY}

What’s striking here is that the passages have nearly identical harmonic frameworks, and yet their energetic profiles are completely different. The languid Act II passage shows none of the gestural similarities to the prelude that its deranged successor does. It’s only in the later passage that the vocal line mounts the focused ascent of the “yearning/negation” paradigm. Similarly, where the earlier passage cadences effortlessly on A-flat major, the later one posits A-flat as an object of striving—hence the chromatic thrust to a rooted, *fortissimo* dominant in the second system. But ultimately the A-flat of Act II remains irretrievable. This leaves us with a fascinating image, and one that I’ll close with: the idea that a characteristic harmonic succession, with all its connotative layers, might be filtered through the gestural gestalt of another passage, producing a hybrid entity combining psychological and dramatic aspects of both. For me, these are the sorts of insights that might spur a more elaborate theory of Wagnerian gesture, one toward which today’s study has taken only the most preliminary steps.