(script for presentation)

Theorizing Notation: Darmstadt, 1959–1965

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name and title

In today's talk, I'd like to take a look at two woefully underexamined essays which have yet to receive official English translations, both issued as part of the proceedings of the Darmstadt Summer Courses during a period of creative fecundity and of profound changes to the art of composition at large which continue to resonate to this day.

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title pages of documents

Karlheinz Stockhausen's short essay "Music and Graphics," published in the first volume of his collected writings *Texte zur Musik*, serves to summarize his 1959 lecture series on recent developments in art music notation. Some six years later, György Ligeti would respond, albeit indirectly, with his own lecture-turned-essay: "New Notation: Means of Communication or End in Itself".

These intriguing think-pieces by two stalwarts of Euro-modernist composition share a single motivating question: "What are we to make of this sudden deluge of new notations which have, over the

past five years, thoroughly drenched the new music scene?"

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First wave of new notations

Famously, as of the late 1950s, composers had begun developing often radically non-traditional means of encoding their desired musical moves; motivated, among other factors, by an interest in new instrumental techniques or a yen for some measure of well-behaved indeterminacy. Having arguably begun in earnest with experimental compositions by Morton Feldman, Earle Brown, and John Cage in the United States, these techniques quickly spread across the Atlantic, taking on yet more baroque, seemingly impenetrable new forms which cried out to our authors for some form of exegesis.

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...and the European response

Stockhausen and Ligeti represented, comparatively speaking, Darmstadt's "old guard." Despite their long-running commitment to experimentalism, the two were in a sense the inheritors of a centuries-old lineage which held musical literacy—fluency in a particular sort of notational code—as an unwavering core tenet. Given this dual nature, the two were uniquely poised to critique these new notations; technology which threatened to *destabilize* musical literacy (and in so doing, call into question basic axioms of the composer-performer relationship).

So, what makes these first encounters between Darmstadt's establishment and its avant-garde more than a historical curiosity?

In short, as I support more fully in my recent dissertation, I argue that the aesthetic and philosophical problems motivating

our two authors have not seen sufficient scholarly regard in the intervening sixty-plus years. That is to say: More composers every year discover new ways of working with unconventional sign-systems in pursuit of new soundings and new structures of composer/performer agency—perhaps both a cause and a symptom of the increasingly porous boundaries between "literate" art music and various forms of improvised music which have their own complex relationship to notation.

Despite this, we still seem to lack a coherent body of theory seeking to explicate these practices with any degree of abstraction; one which might be able to offer a substantive familial structure or analysis-of-function in order to articulate the ways notation in its *many* old and new forms mediates our music-making. Serious open questions persist:

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OPEN QUESTIONS (IN BRIEF)

- Shall we take the score to be a visual artifact which formally represents some idealized performance? Or is it better understood as a set of instructions meant to *bring about* such a representation?
- Does this answer still obtain if the score uses notation which no longer points to sound in any real capacity?
- Must a notation provide coded instructions at all?
- Or, on the other hand, is any inscription a form of notation so long as it may, in some sense, be interpreted such that it yields sound?
- Finally, taken whole, are the seemingly revolutionary new notations of the 1950s and 60s distinct enough to merit entirely new familial categories? Or do they merely represent

a gradual decentering of Romantic notions of notational precision?

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Makrokosmos and Treatise

As evidence that notation has a language problem, we only need look to the tragic vagueness of the common term-of-art "graphic notation," which we routinely use to refer to pieces as functionally distinct as Crumb's *Makrokosmos*, in which the score's "graphic" attributes play a more-or-less decorative role, and Cardew's infamous *Treatise*, which consists *entirely* of graphic elements merely resembling traditional notation to varying degrees.

I suggest that any notation theory worth its salt will have developed language with which to effortlessly distinguish these two schemes—and ideally answer a few of those thorny philosophical questions as well.

If nothing else, my goal here today is to demonstrate that the seed of such a theory may well lie hidden in these early inquiries.

Stockhausen was evidently among the first to take these new notations seriously as a scholarly topic. His 1959 lecture series explored several bleeding-edge works which had garnered enough interest among Darmstadt's programmers to receive European premieres that year; among them John Cage's notational tour-de-force, the *Concert for Piano and Orchestra* and Sylvano Busotti's radical *Five Pieces for David Tudor*—two works which will eventually prove pivotal to *both* authors' theses.

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Stockhausen's axes

Throughout his essay, Stockhausen describes notations according to their positions along two quasi-independent axes: one running *prescriptive* to *suggestive* and one from *ear-centric* to *eye-centric*.

For instance, his category "notation-script," encompassing our familiar common practice and mensural notations, is defined by the way its symbolic systems prescribe concrete sound phenomena toward which a reader aims in performance.

Being that any system designed for reading must comprise some visual elements, they naturally feature graphical characteristics which distinguish their "trace" from those of other symbolic systems. However, Stockhausen argues, notation-scripts remain *pictorially neutral*—in other words, their graphicality is purely incidental; developed according to what was convenient to the inscriber and bearing no meaning in and of itself.

Therefore, he claims, traditional notation presents itself to performers purely as musical events situated in time. Its graphicality is only a sort of container for the details of these events—making notation-script strictly ear-centric as well as prescriptive.

The schism which motivated Stockhausen's enquiry, however, arose when this graphicality began to change and grow; ultimately beginning to spill over into the realm of meaning.

He writes that "[a]s soon as the temporal course of music is congealed in a picture so that the temporal connections become spatial [...] the communication of music gains simultaneous, extra-musical attraction. Temporal experience allows itself to be transposed into spatial experience." [end quote]

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Stockhausen's axes ii

This "transposition" is demonstrated in the second of his formal types, "action-scripts,"—spatialized, eye-centric notations which graphically depict performers' physical *actions* rather than the sonic products themselves. Here, Stockhausen cites Renaissance tablature as an important antecedent insofar as it symbolically guides the player's hand directly rather than point to explicitly designated pitches or timbres.

In their modern forms, action-scripts likewise illustrate parameters of physical movement in instances where it would prove overbearing to notate each resultant sound.

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LACHENMANN'S GRAN TORSO

Here I am reminded particularly of Lachenmann's works for strings, which often combine traditional notation with detailed action-script describing the left hand's position along the fingerboard or the right hand's bowing patterns.

Stockhausen notes, however, that not all such action-scripts mediate gesture so precisely. Rather, the most radically new forms of notation opt to instead [quote] "give the performer an *idea* of the music instead of a *prescription* [...] describ[ing] not the sound phenomenon itself, but the *direction* the player could take."

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CAGE AND BUSSOTTI

These suggestive, less-determinate forms of action-script constitute "draft-script," the third of his familial types and the extreme end of eye-centric notation. Here he cites the two new works premiered by Cage and Bussotti that year which both, in a sense, parodize traditional forms of notation with their playful, indulgent

graphicality.

For Stockhausen, Cagean or Bussottian graphicality has blown past the point of mere action-script into new territory where notation is not employed for reasons of economy or ease of comprehension, but for its own sake: as a novel form of multi-valent art-object and as an exciting new vector for experimental performance mediation.

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Stockhausen axes iii

Completing our axial chart with these new categories reveals a distinct arcing path tracing a historical narrative which Stockhausen dubs "the emancipation of the graphic from the acoustic" in clear homage to Schoenberg's "emancipation of the dissonance" coined some thirty years earlier. For Stockhausen, Cage and Bussotti represent not only the latest forking path on notation's phylogenetic tree, but ultimately the terminus of a long evolutionary process—one taking us from the vagueness of pre-medieval neumes through the precision of common practice notation, and now ending with these new graphics, themselves delights to the eye which offer their interpreters near-total creative liberty.

However, while Stockhausen's observations here were timely and even compelling, it is clear that Ligeti, who would certainly have been aware of these lectures if not in attendance himself, saw some room for improvement in Stockhausen's ability to robustly distinguish these new notations from older forms and from each other.

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Ligeti's notation typology

Like Stockhausen, Ligeti devises broad typological categories for

both historical and contemporary notations. He first distinguishes "Result-notation," symbols which, like conventional notation, reference musical *products*, from "Realization-notation," symbols which reference musical *processes*. This latter category is further split into "Action-notation,"—functionally equivalent to Stockhausen's action-script—and "Recipe-notation," which similarly denotes details of player-instrument interaction, only without the aid of spatial metaphor: using instead verbal instructions or tablatures.

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KAGEL'S IMPROVISATION AJOUTÉE

Here using a particularly lurid page from Kagel's *Improvisation Ajoutée* as an example, Ligeti illustrates how these three families can be creatively combined to bring about a composer's desired sounds or processes. In this example we can see result-notation used for precise pitches and rhythms, action-notation for looser, more improvisatory gestures, and recipe-notation for gestures which are better described with text, like the pulling of particular organ stops.

Ligeti also echoes Stockhausen's observation that "graphicality" is merely a property *inherent* to systems of symbolic representation and that new notation's sometimes disorienting pictorial form quickly fades into the background as the underlying code becomes more familiar to us as players.

However, straying radically from Stockhausen's framework, Ligeti places his critical focus not on notation's spatio-temporality, but on its semantic content; that is, on its ability to hold well-defined meaning and to behave as a coherent symbolic system.

Bracketing for the moment the graphic *in* notation, graphics *as*

notation are, for Ligeti, a category unto themselves—different in kind from the semantic notations we've enjoyed for more than a thousand years.

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PIANO PIECE 3 FOR DAVID TUDOR

To wit: Describing Bussotti's *Piano Piece 3 for David Tudor*, a work presented to Tudor *as you see it*, without formal rules for interpretation, Ligeti notes that the work [quote] "only *apparently* contains signs," that they are "remnants of traditional notation [...] isolated [and] rendered independent. [...] They therefore no longer possess any unambiguous meaning: They have become stimuli for associative interpretations. Composing the actual music, based on this kind of graphic," he claims, "is left to the performer."

This is to say: for Ligeti, a notation *proper* is defined by its ability to function as a coherent system of signs; able to be encoded, decoded, and, importantly, transcoded without significant loss of meaning. Per his trenchant analogy, communicating a musical idea from composer to performer losslessly requires that a notation behave like a programming language: Software originally written in Assembly can happily be transpiled into C or Python or FORTRAN and still retain every bit of its function.

While Bussotti's evocative marks may behave *like* notation in that they move a performer to create music, there is ultimately no strategy by which an intrepid transcriber might re-construct Bussotti's score from a recording: The journey from image to sound in this case can only ever be one-way.

In other words: Because there is no code at work here, no well-defined instruction set mapping visual contour to musical parame-

ter, Bussotti's score lacks inter-translatability and therefore cannot meaningfully be considered notation at all. It is for these codeless images that Ligeti reserves the term "musical graphics."

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Ligeti's notation typology (cont'd)

Whether performers interpret these graphics loosely and interpretively or, as Tudor himself was known to do, according to a highly disciplined *self-imposed* code, they are bound up in an entirely new mode of interaction with the score: no longer one of composer-performer communication, Ligeti says, but of association—what we might consider an act of *ekphrasis*; of capturing the essence of one medium by means of another.

It is precisely this difference between the *coded* and the *codeless*, the *literate* and the *ekphrastic* which leads Ligeti to stake the important claim that [quote] "'Notation' and 'musical graphics' (strictly defined) are [...] two fundamentally different domains, and simply applying the label of 'musical graphics' to any new and unfamiliar sign system that does not conform to the traditional notation is a gross simplification."

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December 1952

Of course, not all modes of inscription slot neatly into one of these two firmly defined categories. Brown's infamous *December 1952*, premiered at Darmstadt the preceding year, is complicated by the fact that despite its prominent graphicality and the considerable latitude it grants its performers, the composer does, in fact, provide a clearly-defined encoding scheme mapping spatial parameters to musical ones.

Here, the same excess pictoriality which led Brown to consider the piece worthy of hanging on a wall also deliberately influence the performer's code-reading, rendering it vaguer and more open to expressions of performer creativity. In short, given that both composer and performer here must arrive at the notation's semantic content collaboratively, Ligeti considers the work a "mixed form" which demands reading in the traditional sense *alongside* a the performer's ekphrastic interpretation.

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Ryan Ross Smith

Heeding Ligeti's warning, however, we should not make the mistake of presuming that any unconventional score is an example of musical graphics or a mixed form requiring creative translation. Here in a more contemporary example, Ryan Ross Smith's animated *Study No. 31* uses intersections between shifting arcs and rotating radii to determine the onsets and durations of tones played on triangles of various sizes. Despite using symbols which, like Brown's, bear very little resemblance to traditional notation, the piece is actually highly deterministic if initial conditions are held constant and could feasibly be re-written on conventional staves if the composer so desired. For Ligeti, its precise instructions and translatability identify it as a "vividly descriptive result-notation" rather than an undifferentiated "graphic score" we would likely think it at first glance.

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S vs. L overview

The question to address now is whether we take Ligeti's skeletal notation theory to be a substantial refinement of Stockhausen's attempt from six years prior.

Despite the fact that his essay never positions itself as an *explicit* response to Stockhausen's lectures, there are enough common threads between them to make comparison inevitable—and in several of these cases Ligeti seems to deliberately respond to Stockhausen's initial arguments.

Both, for instance, key in on the effect of continued *exposure* to a notation scheme, which eventually allows the unfamiliar "graphic" elements to become phenomenally transparent,revealing the functional code at the core of the system. Ligeti, however, goes on to argue convincingly that for "pure graphics" like Bussotti's, no such familiarization is possible given that there is no code to be gradually unearthed—that unlike in notated scores, the process of ekphrasis may begin anew and the associations rewritten each time one gazes at the score in performance.

Likewise, both appeal to the analogy of punch-card computer programming to form their theses but disagree on what the analogy reveals:

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Punch card notation?

Stockhausen, referencing a cutting-edge new synthesizer which used punch cards to encode its sonic attributes, argues that the visual trace of the cards determining pitch, timbre, rhythm, etc., are so far removed from traditional notations that they have become wholly non-representational. Given that one punched "gesture" might be used to define a rise in pitch, a dynamic swell, or an accelerando, one cannot point to a single sonic parameter which is represented in the card's visual trace.

Ligeti, continuing to privilege the semantic, instead convincingly

argues that such cards are, in effect, *maximally* representational notation. When the punch card is interpreted, the program's parameters will faithfully reflect the code's visual representation, every time, without ambiguity. In this sense, the punch-card serves as the most precise sort of "recipe" notation possible given that (ceteris paribus) no variation would be observed from execution to execution.

Ultimately, though, I think Ligeti's refinement hinges on two key points:

First: Stockhausen seems determined to conflate notation's graphicality with its degree of musical indeterminacy.

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INSTRUCTIONS FOR CAGE'S CONCERT

While elsewhere he clearly distinguishes between stricter and more indeterminate notations, he still describes both Cage's *Concert* and Bussotti's pieces for Tudor as undifferentiated "draft-script". In a seeming stretch to cap off his emancipatory narrative, he argues that both works lie at the furthest reaches of both eye-centricity and performer agency despite the fact that the two are functionally quite distinct—with Cage providing meticulous section-by-section instructions for interpretation and Bussotti opting to leave his work provocatively codeless.

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LIGETI'S TYPOLOGY REFINED

Ligeti, on the other hand, takes great care to *divorce* notation's form from its function, recognizing that even an intensely "visual" notation might be impossibly strict or incredibly permissive depending on the operant code. His typology improves upon Stock-

hausen's by implicitly placing Cage's work well into the "open but semantic" category and Bussotti's in the "graphic and asemantic."

Second: I find it particularly compelling that, unlike Stockhausen, Ligeti takes pains to clarify the distinction between indeterminacy which arises *within* a notation's semantic structure and indeterminacy which comes from *without*. A jazz musician reading lead-sheet symbols exemplifies a particular kind of indeterminacy, but does so predictably: the symbols communicate particular harmonic zones that the player creatively articulates. Again, this code may be more or less strict, yielding a more or less predictable performance, but it remains categorically distinct from codeless "musical graphics," which result in a higher-order indeterminacy; bound only by the performer's ekphrastic imagination.

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Strengths of Ligeti's Framework

In short, Ligeti's typological analysis strikes me as a particularly clear-eyed take on the way functionally disparate elements of musical scores have the potential to mediate our music-making via the nature of their semantic content and their very semanticity.

To my mind, the language he uses to describe characteristics of fixed and open notation schemes and the ways they may join with or be subverted by musical graphics ought to be taken seriously as an account of notational semantics—a dramatically idealized, simplified model, but one which may prove invaluable if applied to further study of historical and contemporary notation practices.

Taking a broader perspective, however: It should at least be clear that some of our most lucid attempts at notation theory are to be found at this inflection point in the history of composition—

and that whether one's interest lies in, for example, structures of performer-composer agency; the development of basso continuo; or notation-mediated improvisation in the Afrological avant-garde, one would do well to look toward this under-appreciated slice of mid-century scholarship.

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BIBLIOGRAPHY