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Music Theory's New Pedagogability

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[1] My paper is about pedagogy. At first I take a relatively traditional view of the term: I will be addressing how we teach our students. Later I shall view pedagogy in broader terms, by discussing how we teach ourselves, each other, and those colleagues and musicians outside of the research field who peer in on us from time to time.

[2] My contribution is inspired in part by Patrick McCreless's recently published paper, "Rethinking Contemporary Music Theory."(1) Among other topics, McCreless addresses the relationship between speculative and practical theory. He notes that this relationship has at times been one of severe disjunction, at other times one of close alliance. In music theory's current efflorescence in the late twentieth-century academy, McCreless suggests that the speculative/practical dichotomy is translated into one between research and pedagogy. Although most music theorists practice both activities, a boundary divides them. Introductory pedagogical practice is guided less by current research in music theory than by the speculative theory of past centuries. In the twentieth century, these concepts—octave equivalence, acoustic generation, harmonic function, formal prototypes—have run deep grooves in the pavement, grooves which much current introductory pedagogy retraces.

[3] When I first entered the field as a graduate student in 1979, the boundary between research and teaching at the introductory levels seemed inevitable and unbreachable. At that time, the most progressive and stimulating concepts in the field—middleground motivic parallelisms, dissonant prolongations, double-tonic complexes, Kh-networks, and hexachordal combinatoriality—were embedded in distinct repertories. Grasping these concepts required a saturation in the respective repertories, and then a long walk through preparatory concepts.

[4] I think we are at a somewhat different juncture now. A number of central concepts have emerged in the last fifteen years that can be taught at the introductory level, to students whose only prior exposure is some familiarity with basic notation. In identifying some of these areas, my primary purpose is not to advocate for a particular approach to pedagogy, but rather to establish a position from which to observe the state of music theory as a research field. I will suggest that the opportunity to transgress the boundary between introductory teaching and research reflects other ways that music theorists have been recently crossing boundaries—boundaries between repertories, between compositional parameters, and between domains of knowledge. I will suggest further that these circumstances provide an opportunity to develop a more effective broader pedagogy.

[5] I will now proceed through an imaginary syllabus for the first six units of an introductory course in the fundamentals of

music in the European tradition. Course pre-requisite: ability to "read music," i.e. to passively interpret standard pitch/duration symbols in treble and bass clefs.

[6] When an oral version of this paper was presented at the Plenary Session in Phoenix, my 'pedagogical program' provoked some irritation among a subset of those present, so I reiterate, with some emphasis, that my intention is not to prescribe how music theory ought to be taught, nor even to recommend a particular pedagogical program, but rather, to call attention to the pedagogability of recent music theory—the *potential* for its central concepts to be explained to a population who has not made a substantial prior investment in conceptual or repertorial overhead—and to use this circumstance as a mirror for reflecting back on the current state of research in the field.

[7] UNIT 1. Rhythm and Meter. After reviewing rhythmic notation, establishing the concept of metric hierarchy, and introducing the strong-beat oriented durational patterns most characteristic of art-music and its pedagogy, we turn to the topic of funky rhythms. The concept, but not the name, comes from the work of Jeff Pressing; he calls them "prime-generated."(2) A prime-generated durational pattern recursively applies a durational value that is co-prime with the durational span that separates successive downbeats. An example is the dotted eight-note value in "common" time. Upon reaching the end of a measure, the generating value wraps back to the beginning of the measure and continues to occupy empty beats until approximately half of the available beat-classes are occupied. The method is cumbersome to explain, but, in my experience, not difficult for students to intuit from example. Among those patterns generated are bell patterns characteristic of West African music, and musics of the African diaspora. These include, of course, many of the musics of the United States and their further dissemination in trans-national popular genres.

[8] The concept of funky rhythms creates an opportunity to pay a visit to some students in their musical homes, and in so doing to demonstrate that productive systematic inquiries into musical organization are not the province of Western European art music alone. But there is another virtue as well: prime generativity is characteristic of pitch as well as of rhythm, and thus provides a lead-in to future topics. As Pressing shows, pentatonic and diatonic scales in chromatic space, and triads and seventh chords in diatonic space, are all prime generated, and thus isomorphic with funky rhythms.

[9] UNIT 2. Scales. Diatonic scales are over-determined, and this presents a pedagogical advantage. They can be prime-generated by the interval of the perfect fourth, as Schenker taught. Or they can be taught, perhaps more practically, as a series of whole and half-steps, where the position of the half-steps is governed by the principle of *maximal evenness*.(3) Clough and Douthett's concept is easily intuited, in part because it seems to operate commonly in the physical and social world. Indeed, Douthett has recently shown its application to the behavior of gas molecules.(4) More to the pedagogical point, maximal evenness seems to predict the position of individuals on elevators.

[10] UNIT 3. The Tonic Triad as Melodic Frame. We begin this unit by partitioning the diatonic scale into triadic and non-triadic tones. This partition is both prime-generated and maximally even; the latter concept will eventually serve to underwrite the complementarity of steps and leaps, i.e., of voice-leading and harmony, as emphasized in Eytan Agmon's work.(5) For now, our concern is with studying stock melodic figures that neighbor and pass between degrees of the tonic triad. Here three linked concepts introduced by Steve Larson are useful: inertia, magnetism, and gravity.(6) Together, these terms help characterize fundamental psychological states of expectation and fulfillment prompted by basic melodic figures and their concatenations.

[11] UNIT 4. Two-Voice Counterpoint. We begin our study by partitioning harmonic intervals into dissonance and consonance, and further partitioning the latter category into imperfect and perfect. We then study the syntactic model that leads dissonance to imperfect consonance to perfect consonance. The progression toward perfection and the cadential status of the perfect intervals are both psychologically clarified and historically situated through the Aristotelean notion that the imperfect strives for the perfect, and through the adaptation of these concepts to Christian theology by Scholasticist philosophers.(7)

[12] UNIT 5. Triadic Voice-Leading in Root Position. Having studied triads as the stable ingredients of a diatonic collection, it is time to learn the twenty-four consonant triads as individual entities, and to begin to explore inter-triadic voice-leading, restricted for the moment to root position. We introduce the *Verwandtschaftstabelle* of 19th-century German theory, but

adapted to equal temperament. Motion through the table proceeds by stepwise displacement of a single voice, moving in oblique or contrary motion with the bass. The pedagogy here is rooted in the neo-Riemannian work of David Lewin and Brian Hyer. The incremental moves are Lewin's Leitton, Parallel, and Relative operations, the charting of these operations on an equal-tempered version of Riemann's map is inspired by Brian Hyer's work, and the focus on voice-leading parsimony has been the focus of my own recent research.[(8)]

[13] UNIT 6. Talking About Music. Having spent an intense few weeks learning to talk about music, it's a good time to spend some time examining the language that we've been using. In speaking of Maximal Evenness, we appealed to a notion of objects in space. We studied melodic succession by analogy with physical motion. For dissonance and consonance, we invoked theology; for voice-leading parsimony, we quietly appropriated a central concept from logic and economics. When we spoke of melody as adhering to principles of inertia, magnetism, and gravity, we did not mean to imply that acoustic phenomena have weight, volume, and mass. My own understanding of these matters has been enriched by Thomas Christensen's study of Newtonian mechanics and Enlightenment musical concepts;[(9)] by the work of Janna Saslaw and Lawrence Zbikowski on image schemata and cross-domain mapping;[(10)] and by the writings of Marion Guck, Judy Lochhead, Nicholas Cook,[(11)] and others who have alerted me to the metaphorical nature of many concepts whose source I would not have otherwise considered. Discussion of these matters in the classroom provides points of contact with other questions that colleagues in other departments invite our students to pose, and it provides the more flexible thinkers among them a perspective that will help them deal with their frustrations at encountering the poverty of language about music in the face of the richness of musical experience.

[14] The discussion of the metaphorical nature of musical language marks the end of my hypothetical musical curriculum. I turn now to a consideration of what broader trends are reflected in the circumstances that I have been outlining. Here I return to the theme of boundary crossings that I mentioned earlier. The term has acquired the aura of a buzzword lately, yet its prominence responds to something very real: the rapid migration of populations and the expedited pace of communications. Among those phenomena hurtling through the ether are artistic artifacts, including musics. On this scale, the boundaries that music theorists have crossed in the last fifteen years have been relatively modest ones, but they are nonetheless significant to my theme.

[15] First there are the boundaries between musical repertories within the Western art music tradition. Such boundary crossings are not without precedent: for example, the putative modernist wall of 1908 was long ago transgressed by Adele Katz and Felix Salzer in the one direction, and in the less distant past by Benjamin Boretz and John Clough in the other. But Lewin's *Generalized Musical Intervals and Transformations* has had a crucial and probably long-lasting impact on problematizing the boundary between the atonal and tonal.[(12)]

[16] Second are the boundaries between art music and popular music, between Western and non-Western, between written and oral musical traditions. This is part of a broader trend away from an exclusive focus on the aesthetic experience of the focused expert listener in the sustained presence of the masterwork, and toward a regard for the ordinary cognition of ordinary folks in the perhaps casual presence of perhaps ordinary music. I don't mean to say that the one has replaced the other, but rather that the two orientations increasingly exist side-by-side, so that our discourse about music now travels effortlessly and perhaps tacitly along a continuum between them. On one end of this continuum is traditional analytic scholarship; on the other end, work in music perception and cognition, and work by scholars such as Jay Rahn and Kofi Agawu on popular and folk music traditions.[(13)]

[17] The third transgressed boundary is intimately related to the second. It is the boundary between music and other human activities. Again we can point to a substantial pre-history, including the work of Zuckerkandl and Meyer in the 1950's, and Clifton in the 1970's. But the 1983 book of Lerdahl and Jackendoff, with its articulate advocacy of a cognitive orientation and its compelling demonstration of the general cognitive basis of musical grouping judgments, marked an important moment when musical capacities began to be viewed in the broader framework of mental life.[(14)]

[18] The transgression of these boundaries is, I think, connected to the potential for eroding the boundary between research and pedagogy. The concepts enumerated in my 'syllabus' are style- and music-specific to varying degrees, but all of them point arrows to other domains of musical and human experience. Prime-generativity is powerful because, as Pressing's

evidence suggests, it crosses boundaries of musical style, and even domains of musical organization. Maximal evenness, inertia, and magnetism acquire their power because of their applicability to phenomena in the physical and social world; parsimony because it is a desideratum of logical and economic systems. Whether we take these arrows to represent an ontologically real connection is a matter of preference and ideology. From the perspective I am adopting here, what matters is the heuristic job that each arrow performs: it provides a conduit for explanation, and such conduits are central to the pedagogical process.

[19] My essay so far has adopted a traditionally narrow view of pedagogy, as the education of undergraduate students in the classroom. But we don't only teach our students. We teach each other—fellow practitioners of music theory in the Anglo-American tradition—and we teach (and in turn are taught by) scholars and musicians who locate themselves outside that tradition. I will not attempt an analysis of our scholarly modes of discourse, but it is worth observing that we seem to be collectively placing a higher value on ushering each other incrementally into our private thought-universes. I am thinking especially of the trend toward more targeted deployment of sparser graphic images, in particular, the epic story told by the arrow in Figure 0.1 of Lewin's GMIT, and the technique for graphically transmitting analytic information developed by Lewin in the *Four Analytical Essays* and in Henry Klumpenhouwer's work. (15)

[20] The manner in which we address those outside our profession is also changing. I have in mind here not only targeted pedagogical works, such as those of Straus, Friedmann, and Morris, but also overt works of outreach toward performers, such as Deborah Stein's book (with Robert Spillman) on song, and original works of research that make explicit attempts to maximize their audience when the topic allows, such as the books on tonal rhythm by Joel Lester and William Rothstein. (16)

[21] The increasing possibility of disseminating music-theoretic insights, without huge investment in overhead, provides a number of opportunities for a broadened audience, and a broadened set of dialogues which can mold and inform our own practice. Some of these dialogues have already begun. The commerce between music theorists and behavioral and cognitive scientists is already approaching a healthy volume. This is the area of music theory that treats of fundamental questions by its very nature, and the problem of transmissability seems thereby less acute. The communication gates between music theorists and critical and cultural musicologists are opening a bit more creakily, but the increasing volume and sophistication of historical approaches to music theory will likely oil these doors as a matter of course. The challenge here will be for those of us who deal with problems that are analytic, or ahistorically speculative, to communicate our insights in ways that other scholars, trained in different traditions, will want to absorb them. Martha Hyde's admonition from ten years ago is perhaps less urgent than it was on that similarly commemorative occasion: "If we remain exclusive, competing among ourselves, interested only in our own issues, reading only our own journals, in ten years or twenty we may find that we have conceded the real competition without knowing it, for in the meantime younger music historians are going to be learning analysis—well enough for their purposes if not for ours." (17) Volition furnishes only a portion of the solution to Hyde's challenge. There is also an aspect of communicative technique, analogous to that faced by the "human factors" or "user interface" branch of computer science. The pedagogability of some aspects of recent music theory, to beginning students, bodes well for its transmissability to peers across intra-disciplinary boundaries.

[22] There are two sets of boundaries, however, that we have only just begun to permeate. One of them is work on non-Western music. As repertorial boundaries erode, and Anglo-American music scholars become increasingly aware that music is located in knowledge and behavior as well as in authorized texts, the line that divides our work from research on non-Western and non-classical repertories begins to seem increasingly artificial. Is it possible that work now wearing the jersey "ethnomusicology," by scholars such as Paul Berliner, Simha Arom, and Steven Feld, is no different in kind from work that sports the colors of our own discipline? (18)

[23] Here is a case that clearly outlines the issue. In 1978, archaeologists working in Southern China uncovered a tomb from 433 BC, containing sixty-five bells. Each bell preserves not only its acoustic properties but also contains an inscription characterizing its function in various tonal systems. (19) One might expect that the level of interest that such a discovery might arouse in a scholarly community that identifies its domain by conjoining the terms "music" and "theory" might be tantamount to, say, that of a community of astronomers upon the discovery of a new moon for Jupiter. What does it say about our discipline that, for the last twenty years, we collectively yawned at or slept through this discovery, leaving its

exploration to the archaeologists and materials scientists?[20]

[24] The second boundary is one that divides music theory across linguistic boundaries. There are increasing points of contact between Anglophone theorists and those in Europe and elsewhere. Translations of writings of Nattiez, Vieru, and others have revealed colleagues spontaneously traveling along paths related to our own.[21] A particularly encouraging model of an international approach to fundamental concerns was recently published in Italy. Loris Azzaroni's *Canone Infinito* is striking both in that it combines two genres that are distinct *chez nous*—it is both a first-year theory book, and an introduction to advanced research in the field—and because it is thoroughly international, mixing and mingling much of the best from the American, British, German, Italian, and French theoretical traditions.[22]

[25] Twenty years after the founding of its principal professional society, North American music theory is less insular than it was, but more insular than it need be. The pedagogability of many recent concepts suggests that there are emerging opportunities to communicate our best ideas in languages that can reach audiences beyond our sub-disciplinary and linguistic borders, and that we may not even need to work all that hard to meet those opportunities.

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Footnotes

1. Patrick McCreless, "Rethinking Contemporary Music Theory," in *Keeping Score: Music, Disciplinarity, Culture*, ed. David Schwarz, Anahid Kassabian, Lawrence Siegel (Charlottesville: University Press of Virginia, 1997).
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2. Jeff Pressing, "Cognitive Isomorphisms Between Pitch and Rhythm in World Musics: West Africa, the Balkans and Western Tonality," *Studies in Music* (Australia) 17 (1983): 38–61.
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3. John Clough and Jack Douthett, "Maximally Even Sets," *Journal of Music Theory* 35 (1991): 93–173.
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4. Jack Douthett and Richard Krantz, "Energy Extreme and Spin Configurations for the One-Dimensional Antiferromagnetic Ising Model with Arbitrary-Range Interaction," *Journal of Mathematical Physics* 37.7 (July 1996): 3334–3353.
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5. Eytan Agmon, "Linear Transformations Between Cyclically Generated Chords," *Musikometrika* (1991): 15–40.
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6. Steve Larson, "Scale-Degree Function: A Theory of Expressive Meaning and its Application to Aural-Skills Pedagogy," *Journal of Music Theory Pedagogy* 7 (1993): 69–84.
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7. David E. Cohen, "Aristotelian Physics and the Early Concept of Harmonic Progression," unpublished paper presented at the joint meeting of the American Musicological Society and the Society for Music Theory, October 30, 1997.
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8. David Lewin, *Generalized Musical Intervals and Transformations* (New Haven: Yale University Press, 1987), pages 175–180;

idem., "Some Notes on Analyzing Wagner: The Ring and Parsifal," *19th-Century Music* 16 (1992): 49–58; Brian Hyer, "Reimag(in)ing Riemann," *Journal of Music Theory* 39 (1995): 101–138; Richard Cohn, "Neo-Riemannian Operations, Parsimonious Trichords, and their *Tonnetz* Representations," *Journal of Music Theory* 41 (1997): 1–66.
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9. Thomas Christensen, *Rameau and Musical Thought in the Enlightenment* (Cambridge: Cambridge University Press, 1993).
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10. Janna Saslaw, "Forces, Containers, and Paths: The Role of Body-Derived Image Schemas in the Conceptualization of Music," *Journal of Music Theory* 40 (1996): 217–243; Lawrence Zbikowski, "Conceptual Models and Cross-Domain Mapping: New Perspectives on Theories of Music and Hierarchy," *Journal of Music Theory* 41, no. 2 (1997; in press).
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11. Marion Guck, "Two Types of Metaphoric Transference," in *Metaphor—A Musical Dimension*, ed. Jamie C. Kassler (Sydney, Australia: The Currency Press), 1–12; Judy Lochhead, "The Metaphor of Musical Motion: Is There an Alternative?" *Theory & Practice* 14/15 (1989/1990), 83–104; Nicholas Cook, "Music Theory and 'Good Comparison': A Viennese Perspective," *Journal of Music Theory* 33 (1989): 117–141. Zbikowski's recent "Metaphor and Music Theory: Reflections from Cognitive Science" (*Music Theory Online* 4.1, 1998) and the electronic dialog that it stimulated on mto-talk are but the most recent manifestations.
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12. Adele Katz, *Challenge to Musical Tradition* (New York: Alfred A. Knopf, 1945); Felix Salzer, *Structural Hearing* (New York: Charles Boni, 1952); Benjamin Boretz, "Meta-Variations: Studies in the Foundations of Musical Thought," Ph.D. diss, Princeton University, 1970; John Clough, "Diatonic Interval Sets and Transformational Structures," *Perspectives of New Music* 18 (1979–80): 461–482.
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13. Jay Rahn, *A Theory for All Music* (Toronto: University of Toronto Press, 1982); Kofi Agawu, *African Rhythm: a Northern Ewe Perspective* (Cambridge: Cambridge University Press, 1995).
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14. Fred Lerdahl and Ray Jackendoff, *A Generative Theory of Tonal Music* (Cambridge: MIT Press, 1983).
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15. Lewin, *Generalized Musical Intervals*, op. cit.; idem, *Musical Form and Transformation: Four Analytical Essays* (New Haven: Yale University Press, 1994); Henry Klumpenhouwer, "An Instance of Parapraxis in the Gavotte of Schoenberg's Opus 25," *Journal of Music Theory* 38 (1994): 217–248.
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16. Deborah Stein and Robert Spillman, *Poetry into Song: Performance and Analysis of Lieder* (New York: Oxford University Press, 1996); Joel Lester, *The Rhythms of Tonal Music* (Carbondale: Southern Illinois University Press, 1986); William Rothstein, *Phrase Rhythm in Tonal Music* (New York: Schirmer, 1990).
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17. Martha M. Hyde, "Twentieth-Century Analysis during the Past Decade: Achievements and New Directions," *Music Theory Spectrum* 11 (1989): 38–39.
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18. Paul Berliner, *Thinking in Jazz* (Chicago: University of Chicago Press, 1994); Simha Arom, *African Polyphony and Polyrhythm: Musical Structure and Methodology*, trans. Martin Thom, Barbara Tuckett, and Raymond Boyd (Cambridge: Cambridge University Press; Paris: Editions de la Maison des Sciences de l'Homme, 1991); Steven Feld, *Sound and Sentiment: Birds, Weeping, Poetics and Song in Kaluli Expression* (Philadelphia: University of Pennsylvania Press, 1982).
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19. The initial English-language report of this discovery is Lee Yuan-Yuan, "An Amazing Discovery in Chinese Music," *Chinese Music* 2.2 (1979): 16–17. A more comprehensive report by the same author is "The Music of the Zenghou Zhong," *Chinese Music* 3.1 (1980): 3–15.
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20. See Lothar von Falkenhausen, *Suspended Music: Chime-Bells in the Culture of Bronze-Age China* (Berkeley and Los Angeles: University of California Press, 1993) and Cheng-Yih Chen, ed., *Two-Tone Set-Bells of Marquis Yi* (Singapore: World Scientific, 1994). Falkenhausen's book has been reviewed by a music theorist, Lewis Rowell, although not in a music journal. (See *Journal of Asian History* 29.1 (1995): 91).
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21. Jean-Jacques Nattiez, *Music and Discourse*, trans. Carolyn Abbate (Princeton: Princeton University Press, 1990); Anatol Vieru, *The Book of Modes* (Bucharest: Editura Musicala, 1993).
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22. Loris Azzaroni, *Canone Infinito: Lineamenti di teoria della musica* (Bologna: Cooperativa Libreria Universitaria Editrice Bologna, 1997).
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