

USING BLOOM'S TAXONOMY TO DEVELOP AN APPROACH TO ANALYSIS

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The technique in this article grew out of my experience teaching an upper-division undergraduate course in analysis. I was faced with a particular pedagogical problem, and this technique was a workable solution to it. This is not a major theoretical construct, but rather a systematization of a way of thinking while doing analysis.

The class was small, only seven students. They ranged widely in ability and background, though most were above average students. In class I lectured some, but mostly guided discussions. Our primary source of music for analysis was the Turek Anthology.¹ The students had frequent written assignments, answering Turek's questions or my own. I also had them write a series of more formal analysis papers.

In many regards the class shined: they became quite adept at answering questions, and were sometimes insightful. They were prepared for class discussions, fielded unexpected questions with a minimum of stammering, and sometimes disagreed with each other about the meaning or interpretation of an event. All in all they seemed to demonstrate a grasp of the principles we were working on, and seemed to be thinking.

Despite their good classroom work and written exercises, their longer papers were disappointing. Students were often bewildered about how to begin, and would plaintively ask, "What should I do?" The papers suffered from a lack of focus or a thesis—they were not about anything. Two extremes were common—wild generalizations unsupported by evidence from the score, or opaque progressions of mind-numbing detail. The travelog was used far too frequently—"First he does this, then that comes in, and then he modulated there." Michael Rogers, in *Teaching Approaches in Music Theory*,² draws a distinction between "description," which answers what? and where?, and "analysis," which is concerned with explanations, connections, relationships, patterns, hierarchies, and comparisons—a distinction ignored in these papers. Even though we hope students would learn from model questions and analyses, most students simply do not make the connection between the types of questions they have been asked and the kinds of analysis they should do on their own.

I found this inability of good students to write a coherent paper rather disturbing. I rejected a couple of possible solutions. One, I could gnash my teeth and mumble about their inability to write a thesis sentence, and what are they learning in English 101, and they have no business in college, and how did they even graduate from high school, and they are all headed for careers at Burger King; and then give them Ds. Not very productive. Two, I could write more detailed paper assignments; I knew they were good at answering questions. But that would not solve the problem—simply circumvent it somewhat. Not only that, but such a solution fails to nurture, and even discourages independence and initiative. The importance of a critical spirit to thinking is a theme that runs through much of the research on critical thinking,³ and musical analysis seems to be a ripe field for encouraging such a cognitive style.

I decided that learning to ask the right questions would go a long way toward solving the problem. Since my students were not learning how to ask questions from answering them, I would have to teach them. The literature on questioning is quite extensive. It is widely understood that to encourage critical thinking teachers must ask “divergent” questions (open-ended, with many correct answers) rather than “convergent” questions (closed, with one right answer and emphasis on recall). Unfortunately, the literature stresses teaching teachers to ask questions, rather than teaching students to question.

I found my approach in what has generally come to be known as Bloom’s Taxonomy, more precisely the *Taxonomy of Educational Objectives: The Classification of Educational Goals; Handbook 1: Cognitive Domain* by a committee headed up by Benjamin S. Bloom.⁴ Anyone taking education courses has probably run into the Taxonomy; it is widely summarized and referenced. Its division into lower- and upper-level skills and abilities has been influential in various definitions of critical thinking and has shaped much of the recent discussion about the nature of thinking and learning. The structure of the Taxonomy is summarized in Figure 1.

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Figure 1. SUMMARY OF BLOOM'S TAXONOMY WITH ASSOCIATED VERBS

KNOWLEDGE

- 1.00 Knowledge—Behaviors that emphasize remembering; recognition; or recall.
 - 1.10 Knowledge of Specifics
 - 1.11 Knowledge of Terminology
 - 1.12 Knowledge of Specific Facts
 - 1.20 Knowledge of Ways and Means of Dealing with Specifics
 - 1.21 Knowledge of Conventions
 - 1.22 Knowledge of Trends and Sequences
 - 1.23 Knowledge of Classification and Categories
 - 1.24 Knowledge of Criteria
 - 1.25 Knowledge of Methodology
 - 1.30 Knowledge of Universals and Abstractions in a Field
 - 1.31 Knowledge of Principles and Generalizations
 - 1.32 Knowledge of Theories and Structures
- >>> list, recall, remember, define, identify, label, recognize

INTELLECTUAL ABILITIES AND SKILLS

- 2.00 Comprehension—Ability to make some use of “communication” in a form somewhat different from remembering.
 - 2.10 Translation
 - 2.20 Interpretation

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2.30 Extrapolation

- >>> explain, illustrate, describe, summarize, convert, measure, translate, extrapolate, predict

3.00 Application—Use of abstractions in concrete situations.

- >>> demonstrate, apply, use, construct, perform, solve, use abstractions, show

4.00 Analysis—Breaking down a “communication” into its constituent parts; making clear the relationship between parts.

4.10 Analysis of Elements

4.20 Analysis of Relationships

4.30 Analysis of Organizational Principles

- >>> analyze, differentiate, generalize, distinguish, determine, diagram, inventory

5.00 Synthesis—Putting together parts to form a new whole.

5.10 Production of a Unique Communication

5.20 Production of a Plan, or Proposed Set of Operations

5.30 Derivation of a Set of Abstract Relations

- >>> design, plan, relate, formulate, organize, compose, construct

6.00 Evaluation—Making qualitative or quantitative judgements about value; use of criteria and standards

6.10 Judgements on Terms of Internal Evidence

6.20 Judgements on Terms of External Criteria

- >>> compare, decide, judge, evaluate, conclude, contrast, appraise

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The Taxonomy recognizes six classes in the cognitive domain: knowledge; comprehension; application; analysis; synthesis; and evaluation (each defined in a specific way that is not necessarily common-sensical). Most of the main classes are further broken down into smaller subdivisions. The Taxonomy was intended to organize behavior objectives with the idea that simpler behaviors from the lower categories are combined to generate more complex or higher-level behaviors. This hierarchy has been criticized, and it does have some disadvantages. Richard Paul, the director of the Center for Critical Thinking and Moral Critique at Sonoma State University in California, points out that a one-way view of the hierarchy relegates behaviors in the knowledge class to products of "right answer inculcation," which is antithetical to the idea of knowledge as a product of "rational assent," a necessity in the global process of critical thought.⁵

Other lists of critical thinking skills, the College Board's Project Equality guidelines, and the New Jersey Taskforce Taxonomy of Thinking Skills, are explicitly not hierarchical,⁶ an implicit criticism of Bloom. Further, Bloom himself is rather tentative in his assertion of the hierarchical order, and his discussion of evaluation, the highest-order cognitive ability, is specific in pointing out that "it is not necessarily the last step in thinking or problem solving."⁷ The Taxonomy is meant to be a classification of objectives and behaviors, not a description of thinking and learning processes; thinking does not necessarily begin at the bottom. That said, the hierarchy is still quite useful. A thorough comprehension of the Taxonomy and the ability to apply it by classifying objectives or questions can help students understand the difference between sophisticated analysis and mere description.

A most useful aspect of the Taxonomy is a list of verbs, not explicitly part of the Taxonomy, but which can be extracted from the objectives and test questions (incorporated in Figure 1).

The technique I used in class began with a verb session. I introduced the Taxonomy, its levels, and the verbs in a very short lecture. Then we practiced generating questions about pieces we had already studied (it is easier to ask a question whose answer is already known). To generate questions we just read down the list of verbs in each category: "define _____"; "explain _____"; "differentiate between _____"; and so on. Not all verbs seemed applicable, but many were fruitful. Next we generated questions by applying the verbs to non-musical situations—baseball and current affairs: "Predict whether a manager will choose a left- or right-handed relief pitcher to go against a particular batter in the bottom of the ninth" (extrapolation, 2.30); "Distinguish between premises and

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conclusions in Edwin Meese's concept of strict construction of the constitution" (analysis of elements, 4.10). Analyzing and classifying the questions in the Turek Anthology is a good exercise, and finally I provided students with model questions (Figures 2 and 3). The explicit goal of the verb session is comprehension and application of the Taxonomy. Not attempting to answer the questions frees the students from only asking questions they think they can answer. This session took one class period.

Figure 2. An example of successively higher order thinking skills applied to the orchestration of Handel, Concerto Grosso, Op. 6 No. 1.

1.00 Knowledge

List the instruments called for in the score.

Define "concertino," "ripieno."

2.00 Comprehension

Explain why violins have four staves.

Explain the purpose of the little numbers that are found with the Basso Continuo.

3.00 Application

Use your comprehension of concertino and ripieno to locate passages that feature the concertino.

Locate passages in which concertino and ripieno play different material together.

4.00 Analysis

Differentiate between the material (melodic style, texture, dynamics, etc.) of the concertino sections and the ripieno sections.

Can you generalize about the distinctions?

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5.00 Synthesis

Relate the formal pattern articulated by the alternation of concertino and ripieno with the tonal and harmonic scheme. (You may have to go through a similar progression through the cognitive levels while examining tonality and harmony to consider this question.)

6.00 Evaluation

Evaluate the relationship between orchestration and progressive/recessive tendency (Berry) at various points in the piece, and *compare* that relationship to the relationship between tonality/harmony and progressive/recessive tendency.

Contrast the relationship between concertino and ripieno in this concerto grosso with the relationships between the piano and orchestra in Mozart, Piano Concerto, K. 466.

Figure 3. An example of successively higher order thinking skills applied to the texture in Brahms, Clarinet Quintet, Op. 115.⁸

1.23 Knowledge of Classifications and Categories

Define density-number, density-compression, and diversity value (Berry).

Define homophony, polyphony, heterophony, monophony, counter-melody, accompaniment.

2.10 Translation

Measure the density-compression of every beat in the exposition. (Translating the information in the score to a numerical or graphic representation.)

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3.00 Application

Use the abstraction diversity value in the concrete situation of the exposition by *determining* the diversity value of the texture on a measure by measure or beat-by-beat basis. (One or more lines that are relatively interdependent in direction, interval, rhythm constitute one “real voice”; diversity value is represented by the number of lines per real voice arrayed in a vertical stack. This involves judgement about similarity and dissimilarity, but not judgement about value, which would be 6.00 Evaluation.)

4.20 Analysis of Relationships

Differentiate between the real voices in terms of function—melodic, countermelodic, accompanimental, rhythmic, conventional horizontal filler, etc. (In other words, *make clear the relationships* between the elements of texture.)

Generalize about any relationship between density-compression and diversity value.

5.30 Derivation of a Set of Abstract Relations

Devise a scheme of *classification* for types of textures found in the first movement. (The standard types—homophony, polyphony, heterophony—may not be sufficient.)

Formulate a set of criteria for determining the intensity value of textural relationships in this piece. (Berry’s criteria may or may not be sufficiently detailed or complete.)

6.10 Judgements in Terms of Internal Evidence

Evaluate the role of texture in determining the intensity value of various passages, and compare it to the roles of rhythm and harmony.

Appraise the appropriateness of particular texture types for various formal processes (Berry).

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Next came the three stages of the technique proper. The first stage is to generate questions. The questions should be limited to one aspect of the piece to be analyzed—orchestration, phrase structure, harmony/tonality, texture, rhythm, and so on. At least two questions should be generated at every level. Questions at low levels are rather easy to write with a little practice, but questions at the higher three levels require more imagination and initiative. Students should be reminded that the point is to question, and not to answer; hard questions should not be repressed.

The second stage is to critique the questions and help students put their questions in the right categories. I found especially that low-level questions end up in higher-level categories. "Distinguish between the tonic and dominant triads in the first phrase," uses a level 4 (analysis) verb, but in the context of a knowledge or comprehension activity. The reassigning of questions leaves holes in the upper-level classes, so new questions must be generated to fill in. This stage—critiquing the questions—is important. Students must recognize that certain kinds of analysis are low-level and not sufficient for a sophisticated analysis, a fact that is not at all obvious to many of them.

The third stage is to select some of the most promising questions and answer them. Questions can be selected that match a student's ability and background. During the selection process students should be helped to see that finding answers to the higher-level questions may require first answering the lower-level questions and generating and answering more, similar lower-level questions. To "differentiate between the material of the concertino sections and the ripieno sections" requires first answering the lower-level questions about locating appropriate passages (see Figure 2). Comparing the lines of intensity (à la Berry) in orchestration with those in tonality requires generating and answering lower-level questions in the element of tonality. The three stages are cyclical or global, rather than strictly linear.

I was pleasantly surprised by the results of using this technique. I did not, of course, run this as a research project with a control group and so on, so the results are my subjective impressions (reflected by an improvement in grades). The papers were undoubtedly better. They had a point of view. They were soundly organized. They had evidentiary support for assertions and conclusions—a result, I think, of recognizing the need for low-level answers to arrive at high-level answers. Finally, they were more sophisticated, primarily because their authors had a firmer grasp of what is sophisticated analysis.

A result I did not anticipate was the control my students felt over their papers. They faced none of the bewilderment of earlier efforts, and were

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somewhat more enthusiastic about the assignments. They felt less imposed on, and more that this was their own choice. They felt, in short, more independent.

The goal of analysis, when I used the technique, was to write a paper. I hope that other goals of analysis might include performance, composition, or involved listening to synthesize and evaluate. The ultimate goal of any approach to analysis should be to instill in the analyst a questioning spirit.

NOTES

¹Ralph Turek, *Analytical Anthology of Music* (New York: Alfred A. Knopf, 1984).

²Michael R. Rogers, *Teaching Approaches in Music Theory* (Carbondale: Southern Illinois University Press, 1984).

³Stephen P. Norris, "Synthesis of Research on Critical Thinking," *Educational Leadership* 42/8 (May 1985): 44.

⁴Benjamin S. Bloom, and others, *The Taxonomy of Educational Objectives: The Classification of Educational Goals; Handbook 1: Cognitive Domain*.

⁵Richard W. Paul, "Bloom's Taxonomy and Critical Thinking Instruction," *Educational Leadership* 42/8 (May 1985): 38.

⁶Edward A. Morant and Anita Ulesky, "Assessment of Reasoning Abilities," *Educational Leadership* 42/1 (September 1984): 72.

⁷Bloom, *Taxonomy*. p. 185.

⁸This set of questions was prepared for a Graduate Analysis class, after we had studied some of the material in the chapter "Texture" in Wallace Berry, *Structural Functions in Music* (Englewood Cliffs, N. J.: Prentice-Hall, 1976).