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Jeanne Bamberger, The Development of Intuitive Musical Understanding: A Natural Experiment

This paper discussed a new methodology for non-musicians to learn music theory. Traditional music theory education, as the name implies, consists of front-loading the course with musical notation, principles, terms, and the like. Bamberger takes a different approach: her students learn the theoretical principles of tonal music through experimentation, guided by simple open-ended directives from an instructor.

The question is, or was: is this a reasonable thing to attempt? Apparently prior work existed in the same domain, with results that were not encouraging of Bamberger's effort. The findings from this earlier study say that "...non-musician subjects possessed little capacity to produce coherent tonal structures" and that "...sensitivity to tonal-harmonic structure and function derives largely from formal musical training."

Bamberger decided to carry on anyway, and achieved results that contradicted those from the earlier study. Bamberger's students did indeed demonstrate impressive competence in "producing coherent tonal structures" and exhibited a sophisticated musical sensibility completely at odds with the assertion made at the culmination of the other study. Bamberger attributes the conflicting findings to the conflicting methodologies. In her learning task, the students' principal interaction was to "screw around" with the music: play back the pieces, arrange it, rearrange it, modify it, see how it might be made to fit together, and analyze what happens when the experiments fail.

Traditionally, when people learn to manipulate music they learn to do manipulate notes, which first requires learning to read them and acquiring an ability to decode what seems to a novice to be an arcane notation. Aside from being complex, and miring the student in a relatively boring task before giving him the power to pursue a more interesting one, the "note" is too low-level an abstraction to talk about music. As with any structure based on hierarchy, repetition, and symmetry, the task of composing is made simpler when the atoms of composition more closely match the units of conceptualization. Bamberger's answer to this is the tuneblock, which is a simplified graphical representation of a "chunk" of music where pitch and duration are represented by numbers or letters. Tuneblocks can be iteratively developed, modified, copied, moved around, and several tuneblocks can be grouped together to form a higher-level abstraction. In this way the students can "zoom out" to the overall architecture of the piece, and "zoom in" to the note level. The software that allows all of these manipulations is called Impromptu, and while I personally found the execution of the interface to be somewhat clumsy, it's clearly a big step in the right direction.

Bamberger's results reflect the aptness of the tuneblock abstraction. Her students come to understand, at a high level of sophistication, the principles of music theory, and they do so mainly by discovering it themselves. This is a fascinating result, something akin to taking a one-semester undergraduate course in geometry and emerging having derived book I of Euclid's "Elements."

The students' ability to discover the rules of tonal music is strong evidence that musical intuitions arise from either a) biological predisposition, or b) statistical exposure to culturally normative musical structures. Both the result and its implications are fascinating, and I'm surprised it's not pursued at greater length, though perhaps she does so in other papers.

I admit to enjoying this paper enormously, and feel that Bamberger's results have a great deal to say about education in general, and the nature of knowledge in particular. It might seem overly philosophical to ask the question: "What does it mean to understand something?" but it's a question that isn't asked enough, at any level. There is no way to prove this hunch without doing another experiment, but I'd bet a thousand dollars that the students in Bamberger's class understand the nuances of music composition more deeply than do students who receive a more traditional music theory course; in other words, they have achieved a real, situated knowledge of the material, one grounded in the fundamental aspects of the topic. Of what use is music theory if one cannot use it to make, or describe, music? Isn't it reasonable to assume that the best theoretician of music is the one whose knowledge can be most tangibly demonstrated?

There is a great deal – there is everything, in fact – to recommend a MacGyver-like evaluation criterion to any knowledge base, to ask: what can you do with it? What can you make with it? It's clear that Bamberger's students have this. It's also clear that they enjoyed the process of getting there, and that a dry and fusty topic was made relevant to their interests. I only wish Bamberger would turn her attention to other topics, like mathematics, or automata theory, or any number of subfields languishing under the ossified and tedious ministrations of its chief practitioners.

I could make a list.