PERCEPTUALISM, NOT INTROSPECTIONISM: THE INTERPRETATION OF INTUITION-BASED THEORIES

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DAVID TEMPERLEY HAS INTERPRETED INTUITION-BASED theories in music cognition, such as GTTM and his own theories, along introspectionist lines. Perception is a better model for such theories than introspection. It is obscure what introspective mechanism would make unconscious representations conscious while reliably preserving their content. The analyses that furnish data for intuition-based theories, moreover, must be in a public language for which there is a satisfactory account of meaning and understanding. It is unclear how this requirement is satisfied on an introspectionist model. A construal of intuition as perceptual judgment avoids these objections. The introspectionist model misleads us into thinking that intuition-based theories warrant conclusions about non-analytical listening. Limiting the data of intuition-based theories to appearances limits their scope and explanatory power, warranting complementation by other approaches in cognitive science.

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“Introspect our mental states as we will, how do we know what to call them?” (Quine 1985, p. 5)

In recent work, David Temperley has made important contributions to music theory and music cognition along lines he calls “introspectionist” (Temperley, 1999, p. 69; 2001, p. 4). He characterizes his work as “introspectionist cognitive science” (2001, p. 8) and includes, in the “introspectionist approach to music cognition,” Lerdahl and Jackendoff’s generative theory, on which his work is based (Lerdahl & Jackendoff, 1983; hereafter, GTTM). (I take Temperley’s work and GTTM to be paradigmatic of the introspectionist approach. Temperley also cites Narmour, 1990, as an example, but I shall not attempt to take account of that theory here.) Although Temperley’s purpose in his book is primarily to present a theory, not to philosophize about it—he is concerned to develop the idea of preference rules—he sets out the methodological and conceptual issues so cogently that we can have no better starting point for exploring them.

Here I shall argue that the theories Temperley interprets as introspectionist are better understood along the lines of a perceptual model, one posed in terms of perception rather than introspection. A satisfactory interpretation of such theories will explain what it is for someone to understand an analysis, and hence how communication between analysts and readers, via analyses with shared meanings, is possible. Interpreting the relevant theories along perceptualist rather than introspectionist lines will better explain those aspects of understanding and meaning, and hence lead to a more satisfactory interpretation of the relevant theories.

Essential to the theories Temperley calls introspectionist is a relation of correspondence, or agreement, between analysis and intuition. Extant views of such theories have been largely silent about what relation someone who comprehends the theory, and is in a position to see its correctness, must have to an analysis—what understanding he or she must have of it—in order to make the required comparison with intuition. Without an account of that understanding, those theories are open to a skeptical worry about communication. How do we know that analyst and reader understand an analysis in the same way? That worry will best be answered by a conception of analysis on which analyses are couched in a public language, with shared meanings common to analyst and reader. What that requires, in turn, is an empiricist account of language acquisition, understanding, and use, applied to music-analytical language. Such an account is most naturally developed along perceptualist rather than introspectionist lines.

I will go on to diagnose an error that we are naturally led into if we misinterpret the theories in question as introspectionist. Such theories make an unwarranted inference, which I call the Backward Hypothesis, from a theorist’s conscious perceptual judgments to the alleged existence of preanalytical mental representations identical in content to those judgments. A perceptualist interpretation guards against this mistake. I shall conclude
with some brief remarks about the scope and limits of “introspectionist cognitive science.”

Let me say at the outset that nothing I am about to say touches on the validity of Temperley’s main music-theoretic project, which is to infer a rule system that predicts certain musical intuitions taken as a starting point; for his work in this I have nothing but the highest regard. My concern is rather with the status of the intuitions themselves, their role in theories he calls introspectionist, and the correct characterization of the nature and structure of such theories.

**Intuition-Based Theories**

The theories with which Temperley is concerned, and which he characterizes as introspectionist, begin with intuitions. Readers, he tells us, will want to “compare [the theorist’s] claims with their own intuitions” (2001, p. xi). According to Temperley, the relevant intuitions are “intuitions as to the correct analyses of pieces” (p. 6). As we have noted, paradigms of such theories are GTTM and Temperley’s own. Not to prejudice the correct interpretation of such theories, let me call them “intuition-based.” According to an intuition-based theory, a listener (of a certain kind) has mental representations that correspond to, or are tokens of, the analyses the listener finds intuitively correct. The listener confirms that he or she has a mental representation that corresponds to a particular analysis when he or she finds that the analysis agrees with intuition. Since such theories are typically generative, meant to generate all and only correct analyses, confirmation of the theory as a whole depends on such agreement in particular cases.

An intuition-based theory involves, then, (at least) three sorts of things: mental representations ascribed to a listener, analyses, and intuitions. The ascription of a certain kind of mental representation to a listener is confirmed by a relation of agreement between analysis and intuition, where the analysis serves to identify what kind of mental representation it is.

**The Introspectionist Interpretation**

An interpretation of a theory is a view of how it works: its methodology, confirmation, and meaning. Temperley maintains a certain interpretation of intuition-based theories, namely, an introspectionist one. There are two main aspects to this interpretation. The first is that the relevant mental representations are, generally, unconscious (Temperley, 1999, p. 69; see also Jackendoff, 1987, pp. 214, 219, and 293). The second is that intuition is a product of introspection.

On the introspectionist scenario, one hears (or imagines) the music and thereby comes to have a mental representation of it; moreover, this representation normally is unconscious. But then how does anyone come to know that what the theory says about it is true? In order to determine whether the representation corresponds to a given analysis, one must have access to it: one must shine a light on it or examine it in some way. According to Temperley, though the representation is unconscious, it can be “made conscious through sustained introspection” (Temperley 1999, pp. 69; see also p. 79, and 2001, pp. 6 and 8). Hence, if I understand Temperley correctly, an intuition is the conscious product of an act of introspection directed toward an unconscious representation. Through the detection of a certain relation of agreement between this product of introspection and a given analysis, a listener confirms that he or she has a mental representation that corresponds to the analysis. (What has just been described is intuition in a primary sense. We also have intuitions “as to the correct analyses of pieces,” but those are as it were second-order intuitions.)

By way of illustration, consider GTTM’s grouping structure of the opening of Mozart’s G Minor Symphony, K. 550 (Figure 1, from Lerdahl & Jackendoff, 1983, p. 37).

We find this analysis intuitively correct. Why? According to introspectionism, it is because, first, we have an unconscious representation of the passage that corresponds to this analysis, and, second, that we make

![Figure 1. Grouping structure in the opening of Mozart's G Minor Symphony, K. 550. From Fred Lerdahl and Ray Jackendoff's A Generative Theory of Tonal Music, Figure 3.1. (c) 1982 Massachusetts Institute of Technology; reprinted with permission of The MIT Press.](http://example.com/f1.png)
this representation conscious through introspection, yielding an intuition that agrees with the analysis.

It is worth reiterating that introspectionism is a view about the correct interpretation of certain theories. Introspectionism about any particular theory is a view about the properties of the mental representations ascribed by the theory—namely, that they are unconscious—and about the psychological mechanism involved in the theory’s confirmation—namely, introspection. Temperley adopts an introspectionist interpretation of intuition-based theories, but it is not the only possible one.

What I shall argue in the next section is that introspectionism provides an unsatisfactory interpretation of intuition-based theories, and I shall go on to propose an alternative. If introspectionism were satisfactory, then it would be compatible with a correct account of how analytical language is learned and understood, and it would specify a plausible psychological mechanism by which we have cognitive access to our representations and confirm that an analysis agrees with them. In other words, introspectionism would be satisfactory only if it were compatible with a larger account of how we come to understand what analyses mean and how we come to recognize that an analysis agrees with our mental representations. Introspectionism, I shall argue, faces difficulties in these respects, ones that my proposed alternative is meant to avoid.

Objections to Introspectionism

In this section, I shall advance two main objections to introspectionism. First, it is obscure what psychological mechanism could underlie the process whereby unconscious representations are “made conscious,” particularly in such a way that we can know that this mechanism reliably preserves their content. Second, it is obscure how the terms we use to convey our intuitions could ever come to belong to a public language. Let me take up these objections in turn.

A Reliable Mechanism?

The introspectionist holds, true to his name, that having an intuition involves introspection: that we come to have the intuition by subjecting our unconscious mental representations of music to some kind of inner scrutiny. I think that the difficulties with the idea of founding a science of the mind on introspection are so well known that they need hardly be rehearsed here. As Chomsky wrote over forty years ago, “The greatest defect of classical philosophy of mind, both rationalist and empiricist, seems to me to be its unquestioned assumption that the properties and content of the mind are accessible to introspection” (Chomsky, 1972, p. 25). (Of course, opposition to introspectionist approaches goes back much further than this, as witnessed, for example, by Watson’s classic statement, “Introspection forms no essential part of [psychology’s] methods,” 1913, p. 158.) In the face of this Temperley seems sanguine about the prospects for introspectionist cognitive science, asserting, of certain “mental structures” that he holds to be “unconscious,” that “it seems reasonable to suggest that such structures might be made conscious through sustained introspection” (1999, p. 69).

Temperley’s approach faces the serious obstacle that there is virtually no scientific understanding of the mechanism that would underlie the sort of process to which he appeals: one that transforms unconscious representations into conscious ones while reliably preserving their content. Temperley expresses the hope that “we may examine [musical representations] introspectively without fear of changing them” (1999, p. 80). But it is obscure what the nature of the faculty or mechanism involved in this examination would be, or how we can be confident that its object, which is presumably musical perception in some relatively naive or pristine state, is not changed. It is worth emphasizing that what is required is not only that we have some faculty of examining representations without changing them, but that we can know that we are not changing them.

A Worry About Meaning

To turn now to the second objection. A central element of an intuition-based theory is a certain relation, which we called agreement, between analyses and intuitions. Introspectionism leaves it obscure what public criterion there might be for determining whether a given analysis and a given intuition agree.

A theory, I take it, is a common object of knowledge or debate. If we are to have a theory, then you and I must mean the same things by its terms; else we are talking at cross purposes.

In an intuition-based theory, there is a sense in which analyses pick out or specify the types of mental representations that they agree with. A time-span reduction that designates a certain event in a passage as the head, for example, characterizes that event as the most important one in the passage (Lerdahl & Jackendoff, 1983, p. 120), and thereby comes to stand, in a certain way, for a mental representation in which that event is represented as most important. This relation between analyses and mental representations is a kind of meaning.
Where there is meaning, there is correct or incorrect application. If it makes sense to speak of an analysis as correctly describing the way I hear a piece, then there is also such a thing as misdescribing it; if I can correctly apply a certain analysis to my hearing of a piece, it must also be possible to misapply it, to predicate it of a hearing with which it does not agree. But it makes sense to speak of correct or incorrect only if there is some criterion of application, some criterion that determines when an analysis is correctly predicated of a representation, and when it is not.

We will genuinely communicate only if you and I employ the same criterion for the application of our analytical terms to our representations, and if we know that we do. We will have a theory, that is, only if there is a public criterion of correctness.

What is obscure, on the introspectionist account, is how there comes to be a public criterion for the correct application of an analysis to a mental representation, or, what is the same thing, a criterion for the relation of agreement between analysis and intuition. Hence, a skeptical worry arises: Perhaps the reader of a theoretical work does not, as it were, speak the same language as the theorist. Perhaps they do not understand analyses to be picking out mental representations in the same way. Perhaps the introspected properties that the reader associates with the symbols in analyses are different from the ones the theorist associates with them. If that is the case, then they do not attach the same mental meanings to the symbols in the analysis—they do not associate the same symbols with the same intuitions—so that when the theorist means to be invoking one sort of intuition, the reader interprets this to mean intuitions of another sort, even though they use the same word; and, as a result, they talk past one another.

Evidence that this is more than an idle worry is provided by the following warning in Lerdahl and Jackendoff (1983, p. 108): “In assessing one's intuitions about reductions, it is important not to confuse structural importance with surface salience.”

As I understand this advice, it is meant as a guide to the interpretation of their analyses, and to knowing which intuitions are relevant to confirming them, but clearly its success relies upon the reader’s prior understanding of the term “structurally important”; and one wonders whether Lerdahl and Jackendoff are entitled to be confident that their readers will have a common, sufficiently determinate understanding of the term. What ensures that you will take “structural importance” to pick out, in your inner mental life, the same thing I take it to in mine? What ensures that the property of your unconscious representation, made conscious through introspection and that you associate with the term, is the same one I associate it with? If nothing ensures that, we do not have a theory in the sense of an intersubjectively shared object of knowledge or debate. If, on the other hand, we do have a shared understanding of the term, we are entitled to have some account of what that is, and it is not clear that introspectionism provides the framework for one.

In the same vein, Lerdahl and Jackendoff write that in a satisfactory analysis, “each level should sound like a natural simplification of the previous level” (1983, p. 108). But again, are we endowed with the notion of a “natural simplification” by nature, or is it rather a sophisticated notion we acquire only after doing a considerable amount of music theory? What ensures that you and I mean the same thing by “natural simplification”? If we do not, then although we may choose to call the same or different things “natural simplifications” on a given occasion, we are not actually agreeing, disagreeing, or genuinely communicating with one another because nothing tethers our words to a common meaning. Hence, readers who take “structural importance” or “natural simplification” to pick out something different in their introspected representations from what Lerdahl and Jackendoff take it to pick out in theirs will misunderstand the theory—apparent agreement or disagreement with the theorist will be merely verbal—so that what appears to be confirmation of the theory will actually be a pointless activity.

Temperley states that there is more agreement than disagreement among listeners’ intuitions (2001, p. 7); but if the skeptical worry I am advancing here is well founded, then that agreement or disagreement is only apparent, not real. If, on the other hand, we do share a common analytical language, then a satisfactory interpretation of the theory should provide an account of what it is in virtue of that we do.

The problem is essentially that of how the language in which we describe intuitions—the language of analysis—can be a public language (if, indeed, there is any other kind, Wittgenstein, 1958, §§ 269-293). It seems to me that this point—that analyses are objects of interpretation and understanding in a public language—has been unduly neglected in accounts of intuition-based theories by Temperley (1999, 2001), Lerdahl and Jackendoff (1983), and Jackendoff (1987). Those accounts, it seems to me, tend to ignore the fact that theory confirmation depends on a theorist’s understanding of analytical language, and hence that communication about intuitions depends on the existence of a public language.
The matter of the criterion is, at bottom, equivalent to the question: what is it in virtue of that analyses and mental representations mean what they do, or have the content they have? As far as I can see, Temperley does not directly address the question, or perhaps even recognize that it is a question. But if I read him aright, he inherits the framework of Jackendoff (1987), which eschews realist in favor of conceptual semantics, but from which it then follows that analyses function as names for private objects accessible only to the individual who has them (DeBells, 1999, p. 482). The account of meaning for analyses that seems to be most coherent with Temperley's view is that analyses come to specify the mental representations they do through a process of association. On this picture, analyses acquire meaning through association of analytical symbols with qualities revealed through introspection, for example, association of the term “head” with a certain perceived quality of importance. But this would entail that analytical symbols are, indeed, names for private mental objects, and it is hard to see how any public criterion can come from this. Hence, Temperley leaves it obscure how analyses, construed as specifications of mental representations, have a public criterion of correctness (a lacuna shared by Jackendoff, 1987).

Perhaps Temperley would endorse some account of meaning that does explain how analyses have a public meaning. It is not clear to me, though, how it is possible to do this without, at the same time, providing strong motivation to give up the introspectionist view in favor of the perceptualist model I am about to present.

The Perceptualist Alternative

If there were no alternative but to think of things along introspectionist lines, then we should thank Temperley for biting the bullet. But thinking of intuition as introspection of unconscious representations is entirely optional, for it is open to us and far less problematic to think of it in terms of a perceptual model instead. On such a model, when theorists talk about intuitions about musical structure they are talking about products of a perceptual faculty, the perception or detection of structural properties of the music; and when they write or assent to an analysis they are reporting what they perceive: they are reporting a perceptual judgment about the music. Intuitions about musical structure should be seen, then, as belonging to the more general category of sense perception, including the perception of colors and shapes, or tables and chairs; and the activity of reporting one's intuitions in an analysis is to be understood on the model of reporting what one observes in sense perception, such as, “That’s red,” (i.e., on the model of reporting perceptual judgments about the world).

Comparing someone else’s analysis with your intuitions about a passage, then, is like hearing someone’s report of what he or she sees in a scene that lies before you both and asking yourself whether this is what you see also. Concepts of musical structure are instances of the larger class of empirical concepts: ones gained through sense experience, not through some mysterious process of introspection of the unconscious.

There is one wrinkle. It could be objected: when we listen to music, we typically are not conscious of any analytical description. To summon up such a description requires that we do, in addition to our listening, certain nontrivial cognitive work: for it is informative that the structure I hear in a piece is, for example, a passing motion. What it is to have an intuition—if I understand the introspectionist here—is, then, to make that added step, one in which we become aware of the structure: and what could that added step be but introspection?

This is, however, the move I say is optional. We do have to say that something takes place in these cases, but we do not have to say that it is introspection. Rather, it is a matter of attending to structural properties of the music; it is listening for structure. We adopt an analytical attitude whereby we detect, and are enabled to report, musical structure. In so doing, we engage in a certain activity of appraisal (where the appraisal is of the music, not of one’s inner states), which includes counting, measuring, and comparing. One counts the beats, one measures phrase length, one compares two phrases in length, one compares a passage to simpler passages to ask which it most “sounds like a natural simplification” of, and so on. The notions of analytical attitude and analytical appraisal should replace introspection.

This notion of the analytical attitude helps to explain, incidentally, why it is necessary to rehear or reimagine a passage in order to answer an analytical question about it after casual listening. The required intuition is the product of, and shaped by, our taking an analytical point of view. It is theory laden (Hanson, 1958, p. 19). I remember years ago asking a theorist friend, after he heard a simple passage, to identify the meter. He said, “Play it again; I wasn’t listening for meter.” He needed to hear the passage again in order to focus the appropriate analytical attention upon it. This illustrates how intuition is an active process, more plausibly understood as one that brings structured percepts into existence than as the inspection of a structure already present.
Hence, what I advocate is a perceptualist model of the theories Temperley interprets as introspectionist. I believe that one advantage of this model, in addition to its replacing the relatively obscure notion of introspection with the relatively tractable one of perception, is that it leads to a more satisfactory treatment of the problem of arriving at a conception of the meaning of analytical language, or of what it is for theorists to mean the same thing. As we saw, on an introspectionist picture, it is obscure how words or analytical symbols applied to intuitions can have a public meaning because objects of introspection are, on that picture, private. On a perceptualist model, these questions are on more or less the same footing as those about terms for ordinary sensible qualities such as “red,” “square,” and so on. It is possible to have at least some idea of how we might answer them, or of how we must answer them if we are to respond to the skeptical worry.

The Meaning of Analytical Terms

For if the perception of musical structure is a special case of perception considered more generally, then we may tell the same sort of story for the meaning of analytical terms that we tell about ordinary perceptual terms; and this would have to be, as far as I can see, a broadly empiricist and behavioristic story such as that outlined by Quine (1960). The relevant notion for us is, in Quine’s framework, that of “observation sentences.” On his view, observational terms are learned by induction (p. 43). As applied to music, the account would go something like this: We learn some set of basic terms—e.g., “arpeggiation,” “passing motion,” “diminution”—through exposure to simple, clear-cut examples, much as we do with “blue,” “round,” and so on: not necessarily the same examples for all of us, but enough to create a commonality of behavioral response of assent and dissent to those terms’ application. Such terms would have a common intersubjective “stimulus meaning” (Quine, 1960, pp. 31-33). It would be in virtue of this agreement in behavioral conditioning that the meaning of “arpeggiation” in your idiolect would be the same as in mine, and hence, at least to this extent, we would be speaking the same language (which, of course, would be public). It would be in virtue of having an account along these lines that we might express a conception of what it is for theorists and readers to speak the same analytical language, and in this way meet the skeptical worry. Of course, this is only a rough sketch and it would have to be filled out in various ways, such as by some account of how the meaning of complex expressions, such as graphs, depends on that of the basic terms and on the rules for their combination. But this is in rough outline what I think an account of the acquisition and meaning of analytical language would have to look like, and, as far as I can see, there is no competitor on the horizon. I think it can be made to work for musical analysis, although I am not completely sure of that; but if it cannot then I think music theory has a serious problem on its hands.

Determining agreement of intuition with analysis becomes, on this account, a special case of determining that a sentence expresses one of your perceptual beliefs, that is, a perceptual judgment you are prepared to make. It is acknowledged on all hands, moreover, that the music theorist brings a rich conceptual and linguistic framework to his or her perception of music, and brings it to bear when adopting the analytical attitude. We are talking about perception that is theory laden. Intuition should be understood, then, not as introspection of naive perception, but as theory-laden perceptual judgment.

Does the perceptualist account explain how there can be a public criterion of agreement between analysis and intuition, or (what is the same thing) what it is to speak, correctly, of an analysis as specifying one’s hearing of a piece? Yes, because on the perceptualist account the meaning of an analysis is tethered, in the first instance, to intersubjectively accessible objects in the world. We learn what “head,” or “most important event,” or “surface salience” means in connection with publicly accessible sonic events, and hence, if we acquire sufficiently similar behavioral dispositions in the use of those terms, we speak the same language. On the perceptualist account, the meaning that an analysis has, in the first instance, is a special case of determining its meaning at a more primary level, one at which it represents passages of music in the world. The latter dimension of meaning is the crucial element in virtue of which music-theoretical activity constitutes genuine communication.

Introspectionism Misleads

Wittgenstein (1958) famously suggested that when we fall into error about something, such as meaning or understanding, it is often because a certain picture misleads us (Dubiel, 2008). Introspectionism is such a picture. It leads us to think that intuitions warrant certain conclusions about a large class of subjects and events, when the evidence actually warrants such conclusions only about a limited subset of them.
As Temperley (1999, pp. 79-80) explains, the theories he calls introspectionist make an inference from a premise about the intuitions of one sort of listener—the music theorist—to a conclusion about the mental representations of a rather different sort of listener: one who is “experienced” but does not necessarily have training in music. From the fact that the theorist finds a certain analysis intuitively plausible, we conclude that there is in the experienced listener’s head some mental representation that corresponds to, or is a token of, the analysis. I take it to be unproblematic, at least for present purposes, that when a theorist accepts a certain analysis on the basis of listening analytically, we are entitled to attribute to him or her a mental representation that constitutes a token of that analysis. This is so for the same reason that we are entitled to attribute, to someone who makes a verbal report, a belief or judgment expressed by that report. Granting, then, that there is some mental representation answering to that description in the head of the theorist who comes to perceive that structure in the music, does it follow that there is such a representation in the head of the experienced listener? Take, for example, the analysis given earlier of the grouping structure of the opening of Mozart’s G Minor Symphony. The theorist, attending to the music with the analytical attitude, discerns that structure. But does it follow that that grouping structure is present in the perception of the experienced listener? Temperley points out (not in connection with this particular example) that this type of inference is problematic and requires empirical support from other directions (2001, p. 7). This amounts to a concession, I think, that the theories Temperley calls introspectionist do not themselves warrant attribution of said representations to experienced listeners.

There are really two issues here. First, is it true that non-theorists have representations of the kind that we attribute to theorists? Second, is it even so clear what is meant by attributing such representations to them? Assuming that we understand what it is for theorists to have such representations, do we adequately specify such a notion by saying that the non-theorists are to have the same sorts of things in their heads that the theorists do? Does “same” bear the weight it is asked to here (Wittgenstein, 1958, § 350)? Arguably, the notion of what it is for non-theorists to have the relevant representations needs to be fleshed out with a fuller specification of the empirical meaning of attributing such states to them, not just to theorists. Attribution of such states may be comparable to attributing to a dog the belief that dinner is ready, which, if meaningful, must be analyzable in behavioral terms that do not involve linguistic behavior. Perhaps the attribution of theoretical beliefs to the non-theorist is comparable to attributing to the dog the belief that his owner will return a week from Tuesday (a belief implausibly attributed to a dog, since, presumably, no creature can have it who does not have a concept of the calendar).

The Backward Hypothesis

I call imputing the content of some rich cognitive state, or the state of some of sophisticated listener, to a state or listener that is in some relevant sense more primitive the “Backward Hypothesis.” (The former state is, as it were, projected backwards, Peacocke, 1992, p. 82.) The inference we just saw is an example of it. But there is another instance of the Backward Hypothesis, in a sense prior to the one just considered, that is implicit in the introspectionist approach and that has been insufficiently remarked on. It consists in supposing that facts about the cognitive state of a listener who is listening with the analytical attitude will hold of that same listener when he or she is not listening analytically. So again, supposing that there is some mental representation corresponding to the given segmentation of the opening of K. 550 in the head of the theorist who comes to perceive that structure in the music upon listening analytically, does it follow that there was such a representation in his or her head all along? As I have said, verbal behavior gives us good reason to attribute such mental representations to the analyst when he or she listens with the analytical attitude and has an intuition that the piece is structured that way. But introspectionist theories go further: they hold, at least covertly, that such representational states are present in musical cognition even prior to the analyst’s coming to have the relevant intuitions (cf. Temperley, 1999, pp. 79-80). But why should we believe this?

A picture of intuition as introspection, of course, naturally leads us to think in this way, because introspection suggests a static situation whereby the representation is already present in the mind, and only comes to be known or clarified through introspection. But, as I have argued, there is nothing obligatory about this model. On the perceptual model, by contrast, we appraise the music (via the analytical attitude), we detect structure . . . and what follows about what was in our heads before we appraised it? Nothing, as far as I can see: any more than it follows, from the fact that I now notice that the painting before me is a Picasso, that I unconsciously represented it as such prior to noticing that it was; from the fact that I count eleven objects before me, that my visual representation represented the number of objects as eleven prior.
to my counting; from my noticing that the penny on the table is circular, that I had some representation of it as circular, or as a penny, prior to noticing that it was.

Perhaps it is not an implausible empirical hypothesis that there are analysis-like objects inhabiting theorists’ heads when they are not listening analytically. It would certainly be interesting, if true, and bears investigation. But, as with the attribution of such representations to the experienced listener, it would have to be confirmed by some empirical means other than through the reporting of intuitions. It would not be the “introspectionist” theory itself that warrants the attribution of such states to the theorist in such situations, but some other theory. Consulting theorists’ intuitions may be a useful heuristic for the discovery of plausible claims about the perceptual states of experienced listeners, but it does not substitute for the proper justification of them (Reichenbach, 1938).

Hence, there is a problem of scope: the theories Temperley calls introspectionist warrant conclusions about a much more limited class of subjects and situations than their adherents claim. And it is, at least in part, the introspectionist interpretation of those theories that misleads us into thinking otherwise.

I have argued that introspectionism leads us into a certain logical mistake about the implications or scope of intuition-based theories; one that a perceptualist interpretation does not. It can be asked how the analytical or theoretical consequences of perceptualism actually differ from those of introspectionism. One consequence that is broadly theoretical is that, if we are perceptualists, then we will not make the unwarranted inferences that introspectionism leads us to make about non-theorists or pre-theoretical listening. The conclusions of those inferences might of course still be true, but if we do come to hold them, we will do so on the basis of other empirical considerations, ones that actually warrant them. We will infer them within the framework of good science and good psychology.

Still, it could be asked whether there is any actual example of a structural description that accords with the intuition of theorists but, at least arguably, is not a correct psychological description of a listener who is a non-theorist (or of a theorist’s pre-theoretical listening). A well-known example of an argument for the existence of such descriptions is that given in Cook (1987; see also 1989, pp. 119-120). Cook argues that experienced listeners do not perceive tonal closure except on very short time scales. Since, patently, theorists do have intuitions as to the correct analysis of large-scale closure, this would be a potential class of counterexamples to intuition-based theory as understood to apply to experienced listeners. What is required in order to establish whether experienced listeners perceive tonal closure is empirical research along the lines of, for example, Dibben (1994). I do not take myself to be saying anything new by this example, since clearly it has been felt for a long time that empirical evidence other than theorists’ intuitions has to be appealed to in order to establish claims about experienced listeners. Rather, my point is that the mistaken idea that theorists’ intuitions can be relied upon for evidence about experienced listeners derives support from the introspectionist picture, on which a theorist contemplates a mental representation that is, allegedly, already fully formed.

Intuition-Based Cognitive Science?

Finally, I want to turn to the notion of “introspectionist cognitive science,” of which Temperley (2001) says his project is an instance. Is there such a thing? I shall take this to be the question of whether intuition-based theories count as cognitive science. And let me emphasize at the outset that I am talking about theories that rely on intuitions about correct structural descriptions, or “intuitions as to the correct analysis of pieces.” A theory is intuition-based to the extent that the attribution of structural properties by analyses is confirmed by intuitions about those properties.

Temperley (1999, p. 69; 2001, p. 4) draws a parallel between intuition-based theories of music and theories in linguistics, as do Lerdahl and Jackendoff (1983, pp. 5-6). Certainly such theories have properties in common: both musical and linguistic theories appeal to intuitions; more important, both claim that the listener (or speaker, in the case of language) has an unconscious knowledge of rules that govern the operation of the machinery that produces linguistic or musical representations. But there is an important disanalogy as well, which is at the level not of the rules but of the structural descriptions. Though linguistic theory depends for its confirmation on intuitions of well-formedness or grammaticality, and to some extent also on intuitions about sameness of meaning (cf. Temperley 1999, p. 80; 2001, p. 4), there is in linguistic theory no counterpart to the wholesale reliance on intuitions about structural descriptions, couched in the technical terms of the theory being confirmed, as takes place in intuition-based music theories. Linguistics has, in its data, nothing so permeated by theory as “intuitions as to the correct analysis of pieces”; it does not trade on an understanding on the listener’s part of the theory being confirmed, or on a conscious grasp of the structures represented in analyses or in the mental representations.
said to correspond to them. Linguistics has, then, nothing like the same commitment to theory in its data that intuition-based music theory has, and hence has no need of Temperley’s hypothesis that “unconscious . . . structures might be made conscious through sustained introspection” (1999, p. 69). And it is not just that intuition-based theories in music have as their main informant the music theorist, who is presumably not “ordinary”; it is that the information the theorist supplies is shot through with the categories of the theory itself, and depends on the theorist’s understanding of the theory being confirmed. (Jackendoff carries the analogy with syntactic theories so far as to claim that the relevant musical representations are not available to consciousness [1987, pp. 237 and 293], which is patently inconsistent with GTTM’s actual methodology. Temperley, sensibly, does not go along with Jackendoff’s metatheory here.)

Intuition-based theory has for its data, then, appearances of structure, where the concepts of structure contained in the theory are transparent to those in the appearances. Its notions of structure are derived from music’s appearances—appearances of being structured in certain ways—to certain listeners who have certain definite opinions to the effect that it is so structured, and indeed have been trained to perceive it as so structured. It then attempts to systematize or codify, to state generalizations satisfied by, those appearances; it comprises a kind of calculus of those appearances. Whether intuition-based theory is to count as cognitive science is, obviously, something for cognitive science to decide and far from me, an onlooker, to recommend. I certainly cannot think of any argument to show that we cannot learn much from such a project.

I do think, however, that an intuition-based theory has certain limitations built into it that should be acknowledged. One, which we have seen already, is a problem of scope, or of what range of listeners or hearings the theory warrants conclusions about. As I have argued, we are justified in attributing to theorists mental representations that correspond to analyses on the basis of their verbal behavior, but the attribution of such representations to experienced listeners, or to theorists listening non-analytically, is problematic.

But there is an even more significant limitation. Why should the structures posited by a theory of mental representation—including the structures said to be mentally represented—be restricted in advance to those revealed in appearances, to subjects however well trained? If the rules need not be consciously accessible to theorists, why must the structures be? Temperley says that the true goal is explanation (1999, p. 82). But scientific theories as diverse as those of physics and linguistics gain explanatory power by positing theoretical entities that, as it were, lie behind appearances and unify them. The categories that enter into structural descriptions in theories of linguistic syntax, for example, generally have the role of theoretical entities, not observables. They certainly are not limited to the ways syntactic structure appears to us. Why, then, must the concepts of structure contained in theories of musical cognition be restricted to structure as it appears to music theorists? Concepts of the latter sort come from music theory, a non-scientific paradigm in which they are expected to do all sorts of work other than explaining cognition, such as in teaching people to compose. There is no reason to expect that the kinds of structure that are best suited for explaining cognition will always coincide with those that music theorists have been trained to perceive. What assures us that the latter are even always veridical (pace Temperley 1999, p. 69)? Essentially, intuition-based theory imposes on the notion of a structural description the constraint that the concepts contained in a structural description must all be observation concepts; but this constraint is entirely optional.

If we are going to posit mental representations, then, we need not be so timid as to limit the structural categories contained in them to those present in appearances. I can think of no argument that the latter will not in general be useful for cognitive science, but it is hard to see any reason to limit cognitive science to them a priori. (To be sure, Temperley acknowledges that cognitive science need not be so limited, 2001, p. 6; 1999, p. 81.)

What would be an example of a cognitive theory in music that is not restricted to being intuition-based? Theories that use geometry to represent musical relationships (Krumhansl, 1990; Lerdahl, 2001; Tymoczko, 2006), including theories of tonal pitch space, suggest such an example. If a theory characterizes cognition in terms of a space that has certain geometrical properties or structure, we may well look in vain for “intuitions as to correct [descriptions]” of that structure as a whole, and hence for intuitions about some of the geometrical properties that characterize the space. We may have intuitions about local relationships or distances within that structure without having intuitions about its overall shape. (To the extent that a theory of this kind posits structural properties that go beyond those in terms of which we have intuitions, it is not intuition-based.)

In sum, it is certainly possible to limit the data of a theory, as intuition-based theories do; to data about how music appears to us to be structured when we condition ourselves to perceive it in certain ways; but this
is a substantial limitation that, with good reason, the cognitive science of music need not universally adopt. Hence, at the very least, intuition-based theories should be seen as part of a larger research project complemented by other approaches.

Conclusion

Let me recapitulate the main points of this article. Intuition-based theories of music are better understood in terms of perception than introspection. It is obscure what introspective mechanism could be invoked to support the claim that listeners have a capacity to make unconscious representations conscious while leaving their content unchanged. What is more, if theoretical activity consists in genuine communication, then analyses must be in a public language for which there are attendant notions of meaning and understanding; it is obscure how introspectionism provides such an account. A perceptualist model of intuition-based theories, consistent with empiricism, explains how analyses have public meaning and are objects of shared understanding. Introspectionism, via the Backward Hypothesis, misleads us into thinking that theorists’ perceptual judgments justify conclusions about the theorist’s alleged pretheoretical representations and those of the experienced listener. Finally, intuition-based cognitive science may well be of value, but, because its data are limited to the ways musical structure appears to theorists, its scope and explanatory power may be correspondingly limited, warranting complementation by other approaches in cognitive science.

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