

# ***The Role of Music Theory in Music Appreciation: Scientific Explanation or Interpretation?***

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ABSTRACT. Music appreciation raises a number of intriguing questions, not only from the point of view of what we understand and appreciate when listening to music unaccompanied by text, but also with respect to the role of music theoretical knowledge in the process of understanding and appreciation. Some may argue that there are relevant and adequate analogies between music theoretically informed listening and specific types of scientific explanations, while others may hold that understanding and appreciating music belongs to the realm of interpreting artworks. In this paper I consider the debate between the interpretation and the scientific explanation accounts of music theory, and I argue that the scientific explanation account is mistaken, for its proposed analogies break down. I also examine the role of ear training from the point of view of this debate, and I propose that the interpretation account needs to be extended with an explication of the role ear training plays in theoretically informed appreciation of music.

## ***1. Music Theory as a Science of Revealing Hidden Properties of Music***

In Chapter 7 of his *Music Alone*<sup>1</sup> Peter Kivy provides an elaborate account of the role of music theory in music appreciation. The question raised is whether “theory” is to be understood as a kind of scientific explanation

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<sup>1</sup> Kivy, 1990.

or we may have to look for another understanding, more in the realm of interpretation. Although, of course, there are several ways and methods of scientific explanation, there is at least one kind that seems to be an initially plausible candidate for being analogous to what music theory is often argued (or assumed) to do. Specifically, it is the kind of scientific explanation, as explicated by Searle<sup>2</sup>, which aims to account for the readily available, perceptible “surface” properties of some phenomena in terms of their microstructure. In this special case of cause and effect relationship, the surface feature is both realized in (or consists in) and caused by the micro-level properties. The perceptual properties of physical objects can be explained in terms of their molecular structure; the surface features are both realized in and caused by the microstructure. For instance, the liquidity of water is caused by the properties of its molecular microstructure, but liquidity is also a property that is realized in (or consists in) that very same microstructure. Musical analysis might be understood to be analogous to this kind of scientific explanation, if it can be shown that some surface properties of music are to be explained this way. That would require showing that we can explain perceptible (audible) musical properties by some “microstructural” features of music that are not readily available (i.e., not perceptible) for appreciation. Kivy asks us to consider whether or not such an analogy with the kind of scientific explanation in question is defensible.

In order to answer this question Kivy first considers the kind of thematic analysis that is mainly associated with Rudolph Reti<sup>3</sup>, but also practiced by many others. First Kivy provides his own example: the analysis of the first movement of Haydn’s Symphony No. 104 in D Major. Although it is quite obvious for most listeners (certainly obvious for Tibby, Kivy’s theoretically informed, “expert” listener) that the movement in question is monothematic, Mrs. Munt (who has no musical training and theoretical knowledge whatsoever) may not realize that without some help. By “chopping off” the endings of the two themes, however, it can be easily shown to Mrs. Munt that the two themes are in fact tokens of the same melodic type. Having realized that the second theme is only a slight vari-

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<sup>2</sup> Searle, 1984, pp. 20–22.

<sup>3</sup> Reti, 1961.

ation of the first, Mrs. Munt is now enabled to perceive monothematicity as an aesthetic property of the music she attends. That is, she will realize and *bear* “that this relationship between the two themes is a ‘real’ aesthetic property of the work”<sup>4</sup>. Moreover, having been enabled to perceive this property of the music, Mrs. Munt is also in the position now to appreciate thematic unity; this perception of the coherence of the movement was not available to her before learning about the above simple analysis, although she probably heard the music as “unified”. The importance of this example in Kivy’s argument, and the reason why he holds that this kind of analysis is interpretation and not scientific explanation, will be apparent when we can see it in the light of his objections against Reti’s analysis of Beethoven’s Ninth Symphony.

The analysis provided by Reti is taken here as a paradigmatic example of an analysis that may be considered analogous to the kind of scientific explanation discussed above. Reti’s aim is to show that the perceived coherence of the work originates in its monothematic structure that is hidden from bare perception. In the analysis discussed by Kivy, Reti argues that the “Ode to Joy” theme is the variation of the first subject of the first movement of Beethoven’s Ninth Symphony.<sup>5</sup> Reti’s analysis consists in showing that once “inessential” notes are disregarded, the underlying structure of the two themes is similar – despite their apparent “surface” (that is, audible) dissimilarity. Should Reti be successful, this would not only mean that the property of being monothematic may be extended beyond individual movements to whole works, but also that the coherence of the whole work is now explained by the same kind of thematic unity demonstrated in Kivy’s example discussed above; the two themes in question could be considered tokens of the same melodic type.

Kivy finds two problems with Reti’s analysis: one methodological, and one phenomenological (concerning perceptibility). Without going through here all the music theoretical (technical) details of Reti’s analysis and Kivy’s criticism, the methodological problem can be summarized as follows. Reti uses the method of transformation to get one theme from the other; for example, to get the scale structure of the “Ode to Joy” theme from the

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<sup>4</sup> Kivy, *ibid.*, p. 128.

<sup>5</sup> Reti, *ibid.*, pp. 11-16.

triad structure of the first movement's first subject. Such transformation may certainly (i.e., *musically justifiably*) involve the removal of inessential, ornamental passing tones, for those tones do not belong to the preceding or following chord. This musically justifiable method, however, does not yield the desired result for Reti. As Kivy argues, by the removal of nonchordal passing tones alone, Reti is unable to demonstrate that the aforementioned themes are tokens of the same melodic type. He can only achieve this result by removing and adding chordal tones as well.<sup>6</sup> Reti, however does not and cannot provide any musically justifiable reasons for such transformation; removing and adding chordal tones in order to show the identity of two themes is simply getting what one wants by transforming one theme *without any constraints* until it is "similar enough" to the other. Kivy concludes that this method of analysis amounts to nothing more than finding whatever one wishes to find in the music without any constraints on the finding technique, and on what counts as "real" identity of themes. For surely, by using Reti's method, any theme can be shown to resemble (being a variant of, etc.) any other theme. It is merely the question of unconstrained transformation steps of removing and adding chordal tones until one gets the desired result.

Kivy's second reason for rejecting this kind of analysis is that it does not provide the listener with anything to be heard as part of the musical experience. Specifically, after learning what Reti's analysis "reveals" about the true but hidden nature of Beethoven's Ninth, we still cannot hear the thematic relationship that is allegedly an aesthetic property of the work.

For what Reti "reveals" has absolutely no effect on our listening: it is "there," to be sure, but no more heard as part of our musical experience, after the revelation, than a statue is seen in an unworked block of marble, for all the assurances of the sculptor that it lies beneath.<sup>7</sup>

The first problem with Reti's analysis entails that if it is to be considered science, then it's bad science, for its methodology is highly questionable. Of course, other kinds of musical analyses might avoid this problem by

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<sup>6</sup> Cf. Kivy, *ibid.*, pp. 133-136 for the specific and detailed analysis.

<sup>7</sup> *Ibid.*, pp. 142-43.

putting appropriate restrictions on the finding techniques.<sup>8</sup> Even so, the second problem is sufficient for Kivy to argue that revealing properties that cannot be heard is irrelevant from the point of view of music appreciation. Kivy holds that if the analysis in question reveals properties that in fact can be heard, then musical analysis is better understood as *interpretation* rather than scientific explanation. Let us see why he thinks so.

Kivy's reasons are clear from the example he provides: the analysis of the first movement of Haydn's Symphony No. 104. That analysis revealed a real aesthetic property of the work; it revealed a property that can be heard, and that can be made available for even Mrs. Munt's appreciation (see the discussion above). Kivy is concerned with music appreciation and the role of music theory in *that*. Revealing some unperceivable properties of a musical work is, hence, of no interest from the point of view of music appreciation; "as the present essay concerns the musical work as heard, what cannot be heard is not part of the work, nor is what was not intended to be heard". If musical analysis is understood as a tool of enriching our music appreciation, then revealing unperceivable properties of music is no more relevant to this end than revealing the properties of sounds with the help of an oscilloscope. Therefore, if music analysis does more than revealing real (i.e., perceivable) aesthetic properties of music, then it is not the analysis of music as an aesthetic object. If it does just what was shown by Kivy's example (it reveals properties that can be heard), however, than it will be no longer analogous to the kind of scientific explanation discussed earlier. For that kind of scientific explanation involves explaining "surface" properties in terms of microstructural features (hidden from bare perception), and there is no analogous (hidden) microstructure in what we *appreciate* in music; if it cannot be heard<sup>10</sup>, it is not part of the *music*, the

<sup>8</sup> Kivy (*ibid.*, p. 137) notes that advocates of the Schenkerian approach claim to have such restrictive principles.

<sup>9</sup> *Ibid.*, p. 144. Apparently, intentions play no role in Kivy's argument. What cannot be heard may be either failed intention (if there was something intended to be heard) or not intended to be a perceivable aesthetic property of the work at all. In either case, what cannot be heard is irrelevant from the point of view of music appreciation (which, of course, does not preclude possible interests of other kind: historical, etc.).

<sup>10</sup> What Reti's analysis allegedly reveals cannot be heard even by Tibby. That is, failure to appreciate those properties is not the result of lacking appropriate music theoretical training.

aesthetic object, that we appreciate. Therefore, so Kivy concludes, music analysis (i.e., analysis that reveals properties that can be heard) is better understood as artistic interpretation than scientific explanation.<sup>11</sup>

## **2. Music Theory as a Science of Explaining and Enriching the Listener's Intentional Object**

In Chapter 5 of his *Music and Conceptualization*<sup>12</sup> Mark DeBellis provides a criticism of Kivy's position, and argues for the acknowledgment of the explanatory status of music theory. He holds that hearing and understanding music in theoretical terms explains our pre-theoretical experience of music. First DeBellis suggests some examples to consider. Closure, for instance, can be explained by motion to the tonic, while lack of closure is often adequately explained by motion to the dominant. What makes such explanations possible is that the tonic generally sounds "stable", while the dominant sounds "unstable"<sup>13</sup>. That is, "surface" properties, such as closure or lack of closure, are explained (at least in part) by the relative scalestep positions of the pitches. Also, a change of emotional tone is often explained by a change in mode from minor to major or vice versa; appealing to change of mode means applying music theoretical terms in the explanation of surface properties of music (such as emotional tone). Finally, so DeBellis argues, unity is often explained by motivic repetition. (His example involves the repetition of a specific rhythm, but obviously, motivic repetition need not be restricted to rhythmic repetition.)

Notice, however, that the examples DeBellis considers are not counterexamples to Kivy's position, for they do not involve revealing any properties that cannot be heard; upon learning the relevant music theoretic terms and the analysis of the given piece, the listener will be able to hear what the analysis reveals.<sup>14</sup> And that was exactly the case with Kivy's own example of the analysis of the first movement of Haydn's Symphony No. 104. For

<sup>11</sup> This, of course does not save Reti's analysis (because its methodology is not acceptable in interpretation either).

<sup>12</sup> DeBellis, 1995.

<sup>13</sup> *Ibid.*, p. 120.

<sup>14</sup> I will suggest a qualification at a later point. What is important here is that the properties in question can be heard.

as we saw, Kivy denies the analogy with scientific explanation on the basis of the lack of the analogous micro-level, where by micro-level in the scientific explanation we mean something unavailable to bare perception. So what we need to see is exactly what reasons DeBellis offers for the *explanatory* (as opposed to interpretive) status of the analysis in music theoretic terms in any of these examples.

Considering the explanatory status of such analyses DeBellis argues,

[...] that the explanatory relation here is not a typical causal one where cause and effect are distinct, but one in connection with the *reduction* of a property such as closure to theoretical properties such as scalestep position. This follows Kivy's analogy of microstructural reduction, such as that of heat to the motion of molecules. On the present account, then, the presence of closure is identified with some complex structural condition in terms of scalestep properties and the like. The explanation, on this account, depends on an *explication* of closure, an account of what it consists in.<sup>15</sup>

What is important in this (reduction) model is that the *explanandum* and the *explanans* are not distinct (or, as DeBellis adds, not wholly distinct). That is, “[t]he event of a passage’s coming to a close is not just something *brought about* by the motion to the tonic, but to some extent *consists* in that motion”<sup>16</sup>. Of course, DeBellis does not argue that discovering relevant identifications (e.g., that closure consists in motion to the tonic) entails discovering laws, that is, generalizations without exceptions in terms of necessary and sufficient conditions. This is not necessary in order to argue that motion to the tonic has an explanatory link to closure. His analogous example is that we do not have to know which material would break under what conditions in order to realize that the rock’s striking the window caused to break it. Also, so De Bellis argues, discovering such identifications falls into the domain of music theory, not in the psychology of music. The reason for this is that the explication of closure is the *reduction* of a “surface” property to theoretical properties of music, not the explanation of a psychological state of the listener (such as feeling of satisfaction).<sup>17</sup>

<sup>15</sup> *Ibid.*, pp. 122-123.

<sup>16</sup> *Ibid.*, p. 123.

<sup>17</sup> This does not mean that DeBellis would deny that there is such a domain for the

In addition to appealing to the reduction model spelled out above, DeBellis makes a further (and according to him, stronger) point as well. Specifically, it is argued that besides what the reduction model shows about the properties of music, there is another observation to be made concerning the intentional object of the theoretically informed listener (Tibby). For the reduction model makes it possible to realize that closure and motion to the tonic are not separable aspects of Tibby's intentional object; "[r]ather, the motion to the tonic, as he hears it, just *is* part of closure, as he hears it"<sup>18</sup>. DeBellis calls this property of Tibby's intentional object "fusion". Fusion therefore means that the way the "micro-level" property (motion to the tonic) is heard is not (or at least not wholly) distinct from the way the "surface" property (closure) is heard. According to DeBellis, this point further supports the claim that musical analysis explicates the "surface" properties of the intentional object in terms of its "microstructural" properties.

### ***3. The Scientific Explanation versus the Interpretation Account of Music Theory***

In what follows, I would like to make two main points. First, I will raise the question whether DeBellis' proposal is incompatible with Kivy's view, or, more precisely, whether DeBellis shows that Kivy is mistaken in holding that musical analysis should not be understood as scientific explanation. I will argue that DeBellis does not offer anything to refute Kivy's position. In this matter, therefore, I will defend Kivy's interpretation account of music theory. However, I would also suggest a distinction between music appreciation and the appreciation of other arts; by doing so I will not argue that musical analysis is to be understood as scientific explanation, but merely that musical interpretation is, in one respect, highly domain specific. This domain specificity is missing from Kivy's account, so my suggestion can be taken as an extension of Kivy's interpretation account of music theory.

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psychology of music. His point is that explication by reduction is not concerned about the psychological states of listeners, but about the different levels of the properties of music.

<sup>18</sup> *Ibid.*, p. 128.

The reasons why I think DeBellis is not successful in establishing that musical analysis is to be understood as scientific explanation rather than interpretation are the following. First, as I mentioned earlier, the examples (and analyses) DeBellis provides are not counter-examples for Kivy's account; the musical properties revealed by the kind of analysis DeBellis discusses are available to perception (can be heard), as opposed to micro-level properties revealed by scientific explanation (such as molecular structure).<sup>19</sup> Second, the reduction model is exactly what Kivy considers and rejects for the reason we already saw; the analogy between scalestep properties on the one hand and molecular structure on the other, for example, breaks down from the point of view of their availability to (bare) perception. DeBellis, however, does not offer any further reasons for considering the two kinds of phenomenon analogous from the point of view of the *explanatory role* of theory in music appreciation; saying that such an analysis is also a form of explication does not establish the desired analogy. Put it another way, it does not show why Kivy's perceptibility requirement would be mistaken. Moreover, DeBellis does not even want to challenge that requirement.

Considering fusion, the special property of Tibby's intentional object, as DeBellis discusses it, we have even more reasons to doubt that musical analysis is to be understood as scientific explanation. For it is not only the case that motion to the tonic is available to bare perception (can be heard) while molecular structure cannot be seen (at least not without some special equipment), but as DeBellis himself points out, there is also an important phenomenal difference between the two cases. In scientific explanation *explanans* and *explanandum* can be presented (and perceived) via distinct modes of presentation;

[o]ne might, for example, see in an electron microscope the motion of molecules that is the heat one feels. What is important about the musical case is that this sort of phenomenal separation does *not*

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<sup>19</sup> Also, DeBellis agrees with Kivy concerning the kind of analysis provided by Reti and others; what cannot be heard is not considered part of the intentional object. The intentional object is enriched by hearing music in music theoretic terms, that is, perceptibility is also a condition on DeBellis' account. Therefore, I will only discuss here the status of analyses that reveal properties that can be heard; what enriches the intentional object and the understanding of music.

occur: the intimate relation between the properties themselves is mirrored in the fusion of their modes of presentation.<sup>20</sup>

Motion to the tonic and closure cannot be perceived via different modes of presentation, as opposed to the *explanans* and *explanandum* of scientific explanations, where such a separation is in fact obvious; the macro-level property is directly available to perception, while the micro-level, if made available, requires some special equipment, such as an electron microscope in the example above. It is not clear, therefore, why DeBellis holds that his examples and arguments establish the scientific explanatory status of music analysis, and why they would refute Kivy's position. For what DeBellis argues seems to be not only compatible with Kivy's position, but the notion of fusion (if DeBellis is correct) in fact supports the claim that music analysis and the kind of scientific explanation both Kivy and DeBellis consider are not analogous. The notion of fusion as a property of the intentional object of theoretically informed listeners of music, in fact emphasizes a further aspect in which scientific explanation and musical understanding and interpretation differ.

#### **4. *The Role of Ear Training in the Interpretation of Music***

Finally, I would like to draw attention to a special, and I think highly domain-specific feature of the perceptual availability of musical properties: a feature that neither Kivy, nor DeBellis considers. My point is *not* a defence of the scientific status of musical analysis, but it may clarify in what respect appreciating music *differs* from interpretation processes in case of other arts. The feature I have in mind is that perceptual availability of the real musical (i.e., perceivable) properties revealed by music theoretical analysis comes in different degrees for a unique reason that is specific to music appreciation. Specifically, years of ear training plays an important role in what properties listeners are able to appreciate. For the reasons to be spelled out below, my views diverge from Kivy's position, because I think the role of ear training is not acknowledged in his account of music appreciation and the role of music theory in that.

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<sup>20</sup> *Ibid.*, p. 128.

Kivy and DeBellis consider simple examples of analysis both in terms of the special music-theoretic terms involved and the properties of music to be heard. Motion to the tonic, for example, is among the properties that can be heard without any special ear training. There are, however, many properties that will only be available for the student of music theory and analysis after years of ear training, which, as well known to all musicians, does not merely consist in providing theoretical information about musical properties. Ear training involves the lengthy and difficult process of *learning to hear* (perceptually identify) intervals and chords relative to a given key. Motion to the tonic is “easy to hear”<sup>21</sup>, so it is that a simple theme is a variation of another; in most cases no special ear training is required for hearing these properties. Mrs. Munt can hear these properties after a very simple analysis. However, *hearing* that the last chord in a cadence is a diminished seventh on the raised sixth degree in D minor<sup>22</sup>, and that it leads directly to the tonic in C minor, instead of progressing back to the tonic in the original key (D minor), seems to be impossible without extensive ear training (at least for most of us, although a novice of Mozart’s talent may surprise us). This is, however, what (among many other properties) a detailed musical analysis of the fourth aria in Mozart’s *Idomeneo* (K 366) would reveal.<sup>23</sup> But Mrs. Munt (who has never had any ear training) will not be able to *hear* that even if we explain (and she *understands*<sup>24</sup>) all the relevant theoretical information (keys, chord structures, scale function of chords, etc.). Of course, Mrs. Munt can hear the modulation as a “rupture” or “slippage”; she can hear that it is “surprising” (for the modulation is not,

<sup>21</sup> I will not be concerned here with why some properties are “easy” to hear, while others are “difficult”. But certainly, ear training starts with the “easy” ones and continuously develops the ability of perceptually identifying musical properties by moving towards more and more “difficult” properties.

<sup>22</sup> Of course, unless one has absolute pitch, i.e., for most of us, who can hear intervals and chords only relatively to each other, “D minor” here means “original key”, and “C minor” is understood relative to that. I will omit this complication, for it bears no significance to my point.

<sup>23</sup> Timothy Urban helped me with the musical analysis.

<sup>24</sup> That is, it is possible to be theoretically informed *without* being able to hear music in theoretical terms. Keys, chord structures, scale function of chords, etc. can be understood without ear training. One may study and understand a lot of music theory without ear training (although the two are usually combined in music education).

or at least not fully prepared), etc. That is, there are many musical properties that she can appreciate. However, she cannot hear the modulation as described above; there are properties that are unavailable for her without ear training. Tibby, on the other hand, *can* hear these properties as well.<sup>25</sup>

I do not suggest that ear training is necessary for music appreciation. As we saw, there are many properties whose appreciation is not the function of ear training. Moreover, the availability of properties that require such training is continuous; there are properties that are “easier” to hear while others require more extensive training. Musical training and music appreciation involve an element to which it seems difficult to find something analogous in other arts. Without attempting to provide an exhaustive overview here I only wish to mention that we do not need any special “eye training” for appreciating the properties of works of the visual arts. This, of course, does not mean that we do not need training, even exhaustive training. The point is that we do not need training that aims to enhance our capabilities of visual perception, so to speak; we do not have to be able to distinguish more colours, our eyes do not have to be “turned into a magnifying glass”, etc.<sup>26</sup> These remarks do not even sound right or adequately analogous, because, and this is my point, the role of ear training in music appreciation is a highly domain specific.

One may ask then whether many properties of musical works that are revealed by musical analysis are in fact not readily available (without ear training) for perceptual identification. The positive answer to the question may seem to be a motivation for considering music theory analogous to scientific explanation in the sense DeBellis suggests, for music theoretical knowledge enriches the intentional object of the listener. There are properties that Mrs. Munt cannot hear; to use Kivy’s analogy quoted earlier, some properties of the statue remain in the marble for her. Tibby,

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<sup>25</sup> Of course, what I suggest here does not depend on this specific example, although I think it is a good illustration. For my point is simple: there are musical properties whose appreciation requires (extensive) ear training.

<sup>26</sup> Reasons for differences between the capabilities of our sense of sight and sense of hearing are likely to be connected to the difference between the survival value of hearing and sight (cf. Kivy, *ibid*, Chapter 1). However, I am only concerned here with the role of ear training in music appreciation; my argument does not depend on why our perceptual makeup is as it is, therefore I will not discuss any possible explanations to that end.

however, *can* hear those properties (they are readily available for him), and Mrs. Munt *can* be enabled to hear them as well.

Molecular motion, however, *cannot* be made available to bare perception. Kivy is right in arguing that music theory is not analogous to scientific explanation, but he does not give us a full account of why that is so, for he does not consider the role of ear training in our music theoretically informed appreciation of music. DeBellis is correct to point out that theoretically informed listening enriches the intentional object of the listener, but he fails to draw the distinction between pure theoretical knowledge and musical training involving ear training. Pure music theoretical knowledge would not enrich the intentional object; it would merely provide us with the information that there are musical properties we cannot perceptually identify. Knowing that there is a statue in the marble, however, does not mean appreciating the statue. I think, therefore, that musical analysis supported with the perceptual identifying ability that comes from ear training is not analogous to scientific explanation, but it is a highly domain specific kind of appreciation, more in the realm of interpretation. One important difference between this interpretation process in the case of music and other arts was spelled out in this paper. There might be other differences as well, but the comparison of the various kinds of interpretation processes in the different forms of art is beyond my task here.

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