

Jan Philipp Sprick, Reinhard Bahr, Michael von Troschke (Hrsg.)

# Musiktheorie im Kontext

***SONDERDRUCK***

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Jan Philipp Sprick, Reinhard Bahr, Michael von Troschke (Hrsg.)

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Lawrence M. Zbikowski

## **Cognitive Science, Music Theory, and Music Analysis**

A number of years ago I came to the conclusion that the discipline of music theory was built on quicksand. Music theory was understood to be the study of the structure of music, but the structure of music appeared to have no existence independent of music theory. The structure of music was, in short, whatever music theory said it was. I didn't care for this conclusion, so I set about trying to find a firm foundation for music theory. I began with the question of where the structure of music came from. The answer that I arrived at is that the structure of music is a reflection of the cognitive capacities of human beings. On the whole, this is not very surprising, since music is a product of human beings and of human beings only. But the formulation had a profound impact on how I thought about music theory: its logical entailment is that music theory has to come to terms with the cognitive capacities of human beings, for it is these that make music – and musical structure – possible.

I doubt that I would have made much headway on this ambitious project were it not for two things: the emergence of the field of cognitive science over the past thirty years, and the coincident development of the field of cognitive linguistics over the past twenty. Together, these disciplines provided a framework for my inquiry and insights into just which cognitive capacities might be important for the production and understanding of patterned non-linguistic sound. As a field, cognitive science is vast, including work in cognitive psychology, the philosophy of mind, neurophysiology and neuropsychology, and what used to be called artificial intelligence. Cognitive linguistics provided me with a useful model for negotiating this expansive field. In general, cognitive linguists are interested in how human cognitive capacities are specified for language. My project, in short, became one of exploring how human cognitive capacities are specified for music. I believed this exploration would have much to tell us about how music is organized – that is, it would reveal the basis of musical structure.

My readings in cognitive linguistics and cognitive science suggested that three general cognitive capacities were important for the production

and understanding of music: categorization, cross-domain mapping, and the use of conceptual models. Through categorization we organize our basic understanding of successions of musical events; I have argued that such categories are in fact where the conceptualization of music begins.<sup>1</sup> Cross-domain mapping is a cognitive process associated with analogy and metaphor, and is the principal way musical concepts are connected with concepts from other domains, especially those structured by language. Conceptual models are knowledge structures that serve as guides for reasoning and inference; each model consists of concepts in specified relationships and pertains to a specific domain of knowledge. Conceptual models shape how we categorize complex phenomena and inform the way we map between different domains. They are also basic to all theories of music, whether those theories are the rough and ready versions used by a jazz musician or the elegant formalizations of professional music theorists.

In what follows I want to concentrate on just one of these cognitive capacities, the capacity through which humans organize the world into categories. While this will provide only a glimpse of my larger project, it will allow me to illustrate my approach and the insights into musical structure it yields. My musical focus will be Jerome Kern's *The Way You Look Tonight*, a tune which exemplifies not only the golden age of American song but which has also provided innumerable jazz musicians with a platform for improvisation.

### ***The Way You Look Tonight* and Processes of Categorization**

My interest in Kern's *The Way You Look Tonight* was prompted by a recording of a live performance that the jazz guitarist Jim Hall made in June of 1975. In the arrangement Hall developed with bassist Don Thompson and drummer Terry Clarke the tune was transformed into a fast, playful jazz waltz. The result quite struck me, for it embodied a lyricism and playfulness that seemed to me among the best things jazz has to offer. Particularly important for my thinking about musical structure was Hall's solo chorus. Before I deal with that, however, I want to develop an account of the basic structure of Kern's tune in terms of processes of

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1 This argument and the related discussion on the cognitive capacities important for the production and understanding of music is presented in Zbikowski 2002.

categorization. Once this is in place I shall turn to the perspective on the structure of the tune revealed by Hall's solo.

### *Processes of Categorization*

Our ability to categorize things is a cognitive process so basic and so pervasive that it can easily escape our notice. Were you to look up from this volume and glance about you, you would most likely see chairs, tables, writing instruments, and things to write on; were you able to go outside, you might see trees, clouds, and cars. If you considered the other things that populate your day, you might think of friends and family members, facial expressions and gestures, actions and activities. Your recognition of these things reflects the categories through which we structure our thought: to recognize a chair is to identify it as a member of the category *chair*; to recognize a tree is to identify it as a member of the category *tree*. Categorization occurs in all sensory modalities and throughout the range of mental activities: we categorize smells and sounds, thoughts and emotions, skin sensations and physical movement.<sup>2</sup>

Given that categorization is so central to our understanding of the world, what part does it play in our understanding of music? In answering this question I have found it useful to concentrate on two aspects of human categorization: the first is basic-level categories, the second graded membership among the members of natural categories. I shall briefly describe each of these before exploring how they are manifested in Kern's *The Way You Look Tonight*.

#### *Basic-Level Categories*

We often think of the process of categorization as starting with the most all-inclusive category and proceeding through gradual refinement to ever-more restricted categories. For instance, we could start with the category *writing instruments*, which would include pens, crayons, sharpened sticks, and so on. We might fine-tune the category to specify *things for writing on paper* (pens, pencils, crayons), and move to ever-greater refinement: *pens*, for instance, would include, *ball-point pens*, *felt-tip pens*, and *fountain pens*; *fountain pens* would include *the black Parker Sonnet that I use for most of my writing*. As attractive as such a scheme might be, it is not one humans use in everyday life. Instead, they begin in the mid-

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2 Barsalou 1992, chap. 2.

dle of this hierarchy of categories at a level psychologists have come to call the *basic level*. In the example above, *pen* is a basic-level category. This level is a compromise between the efficiency of higher levels (which group together, under one general rubric, a large number of objects) and the informativeness of lower levels (which provide a highly specific characterization of a small number of objects).<sup>3</sup>

There are a number of empirical operations that converge at the basic level. The basic level is the highest level whose members have similar and recognizable shapes; it is also the most abstract level for which a single mental image can be formed for the category. The basic level is also the highest level at which a person uses similar motor actions for interacting with category members. Finally, the basic level is *psychologically basic*: it is the level at which subjects are fastest at identifying category members, the level with the most commonly used labels for category members, the first level named and understood by children, the first level to enter the lexicon of a language, and the level with the shortest primary lexemes.<sup>4</sup>

### *Graded Structure*

Research on the basic level showed that the categories through which humans organize their understanding of the world are not given by the environment but instead reflect human interactions with that environment. Another line of research demonstrated that membership in such “natural” categories is not an all-or-nothing affair. Instead, membership is graded through a dynamic process in which the attributes of potential category members are compared with the attributes most typically found within the category.<sup>5</sup>

As an example of such a *graded structure*, consider the category *bird*. Experimental rankings show that subjects in the U.S. view robins and sparrows as the best examples of birds, with owls and eagles lower down in the rankings, and ostriches, emus, and penguins among the worst examples. All are considered members of the category *bird*, but some better represent the category than others. Category structure is consequently graded according to *typicality*: category members range from the most

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3 Barsalou 1992, p. 181.

4 Rosch et al. 1976; Rosch 1977; Tversky/Hemenway 1984.

5 Barsalou 1987.

typical to the least typical. In the case of the category *bird*, robins and sparrows are securely inside the category, while emus and penguins are in danger of being excluded from the category.<sup>6</sup> As the cognitive psychologist Lawrence Barsalou has noted, every natural category that has been studied thus far has had a graded structure.<sup>7</sup>

### ***“The Way You Look Tonight” and Processes of Categorization***

How, then, are processes of categorization manifested in our understanding of a tune like “The Way You Look Tonight”? The answer to this question is a bit complicated, but we can simplify it somewhat if we restrict ourselves to two things important for musical understanding: the comprehension of a series of temporally successive events, and the ability to draw connections between such events on the basis of shared features. Let us take the second of these first, using the jazz lead-sheet version of Kern’s tune given in example 1. As can readily be seen, *The Way You Look Tonight* is in AABA form, which was beloved by writers of popular song during the first part of the twentieth century. In my discussion of how processes of categorization are manifested in our understanding of the tune, I want to start with the A section of the tune, and the topic of basic-level categories.

Although I have no doubt that the A section of *The Way You Look Tonight* hangs together as a unit, it also invites division into smaller sections. Measures 1 through 4, for instance, seem to constitute an integral gesture. Measures 5 and 6 repeat, in a modified form, the second half of this gesture, and mm. 7 and 8 extract the moving part of it to create a figure that leads to mm. 9 and 10, which are themselves reminiscent of mm. 1 and 2. The phrase concludes with the cadential gesture of mm. 11 through 14, which recalls once again the material of mm. 3 and 4.

As will soon become apparent, I am not completely satisfied with this parsing of the tune – the analysis seems to suggest that we understand these chunks as separate from one another, which I think is doubtful. The analysis does, however, point to a basis for musical understanding, one based on the musical chunks that make up the A section of *The Way You Look Tonight*. Particularly striking are the similarities between these chunks and basic-level categories. Attending to these chunks, we are oc-

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6 Rosch 1973; Rosch 1975.

7 Barsalou 1987, p. 102.

cupied not with individual notes or with the sixteen-measure phrase, but with a level somewhere in between. Their cognitive salience thus mirrors that of basic-level categories: in both cases, the focus is on a manageable whole rather than on the smallest parts.

**THE WAY YOU LOOK TONIGHT**

DOROTHY FIELDS JEROME KERN

ANDANTINO

9 F7 B<sup>b</sup> G<sup>m</sup>7 F<sup>6</sup> C<sup>7</sup> F F<sup>6</sup> G<sup>m</sup> C F F<sup>6</sup> G<sup>m</sup> C<sup>7</sup>

17 F D<sup>m</sup> B<sup>b</sup> G<sup>m</sup>7 C<sup>7</sup> F D<sup>7</sup>(b<sup>9</sup>) G<sup>m</sup>7 C<sup>7</sup>

25 F<sup>7</sup> B<sup>b</sup> G<sup>m</sup>7 F<sup>6</sup> C<sup>7</sup> F F<sup>6</sup> G<sup>m</sup> F F<sup>6</sup> G<sup>m</sup> C<sup>7</sup>

33 A<sup>b</sup> A<sup>m</sup>7(b<sup>9</sup>) B<sup>b</sup>m E<sup>b</sup>7 A<sup>b</sup> C<sup>m</sup> B<sup>dim</sup> E<sup>b</sup>9

41 A<sup>b</sup> A<sup>b</sup>dim B<sup>b</sup>m<sup>7</sup> E<sup>b</sup>7 A<sup>b</sup>ma<sup>7</sup> F<sup>m</sup> F<sup>m</sup> C<sup>7</sup>sus C<sup>7</sup>

49 F D<sup>m</sup> B<sup>b</sup> G<sup>m</sup>7 C<sup>7</sup> F D<sup>7</sup>(b<sup>9</sup>) G<sup>m</sup>7 C<sup>7</sup>

57 F<sup>7</sup> B<sup>b</sup> G<sup>m</sup>7 F<sup>6</sup> C<sup>7</sup> F F<sup>6</sup> G<sup>m</sup>9 C<sup>7</sup> F<sup>ma</sup>7 F<sup>6</sup> B<sup>b</sup>ma<sup>7</sup> C<sup>7</sup>

65 B<sup>b</sup> A F<sup>#</sup>dim G<sup>m</sup> F<sup>6</sup> C<sup>7</sup> F<sup>6</sup>

Ex. 1: Jazz lead-sheet version of Jerome Kern's *The Way You Look Tonight*

In other work I have emphasized the connection between this sort of musical chunk – the sort of thing music theorists have called “motives” or “Grundgestalten” – and basic-level categories. In the present case I find the comparison less satisfying. Does it really make sense, for instance, to divide m. 7 from mm. 5 and 6, since we first hear it as a sequential continuation of those measures? Do mm. 9 and 10, with their long durations and octave descent, really belong together with the quarter notes and stepwise motion of mm. 7 and 8? One reason these questions and others arise is that my analysis focused more on the *score* than on the *musical processes* its notation imperfectly captures. Were we to focus instead on these processes a different picture of the essential musical components of the phrase starts to emerge. Measures 1-4 are a unit not because they mark out a neat four-measure chunk but because they have a distinctive *function*: they *present* the basic materials of the phrase. They do so, it is important to note, in an open-ended way, ending on  $\hat{2}$  supported by a  $V^7$ . Measures 5-8 have a different function, which is to *develop* the opening material through repetition and sequence. This development leads to mm. 9 and 10, which *complete* the tonal space sketched in the first four measures and extended in the second four.<sup>8</sup>

Rhythmic details support the different functions of each of these units. Measures 1-4 proceed mostly in whole notes, which under-specify the cut time of the meter signature; mm. 5-8 proceed mostly in quarter notes, which accelerates the surface rhythm; mm. 9 and 10 return to the whole-note motion of the opening. The cadential gesture that follows in mm. 11-14 then revisits the deceleration suggested by the contrast between mm. 5-8 and mm. 9 and 10, beginning with quarter notes, moving to half notes, and ending on the longest duration of the song. This is also the first point in the phrase where the harmonic rhythm matches the meter signature.

This analysis suggests that the musical features of the phrase that are analogous to basic-level categories are not collections of pitches in specific temporal relationships but are instead musical processes. These processes include the setting out of basic material, a developmental variation of this material, and an arrival that leads to a summative cadence.

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8 This view of the organization of this phrase bears a strong resemblance to Arnold Schoenberg's characterization of what he called *sentence form*. See Schoenberg 1967, pp. 20-24; for a concise discussion of Schoenberg's conception of the sentence see Caplin 1998.

The processes flow one into the next, for each process is in fact a precondition for the one that follows; all are realized through pitches in specific temporal relationships, but the processes come before the notes. Our understanding of this composition begins with our recognition of these basic processes as they are brought to life by the specific pitches of this tune.

As I mentioned a moment ago, in other analyses I have found the analogy between the musical materials basic to a work and basic-level categories to be neater and clearer than in the present case. Viewing basic musical processes as analogues to the basic level is, I confess, a somewhat greater conceptual challenge; I have been interested in taking on this challenge not only because I believe it provides a more accurate interpretation of the basis for our understanding of sequences of musical events such as that represented by Kern's tune, but also because it fits with the approach to musical grammar I am currently developing.

Let me now return to the topic of graded structure and the variations that can occur between members of the same category. My focus will be on the category associated with the gesture that first appears in mm. 3 and 4 of Kern's tune, which comprises a stepwise progression of four quarter notes that arcs through a minor third and culminates in a whole note. (Note that this category is somewhat more abstract than the categories discussed above, since it is extracted from the holistic structure of mm. 1-4.) For the sake of concision I shall call this category X. Another member of category X occurs in mm. 5 and 6; since the A section is repeated twice more there are at least six members of category X that appear over the course of the tune.

Some, but not all, of the features of category X can be seen in the cadential gesture of mm. 11-14; were this included in the category another four members would be added (with the repetition of the cadential gesture at the end of the tune). Given the prominence of the quarter notes of mm. 7 and 8, and their proximity to the first two members of category X, a case could be made for including them in the category. A somewhat different situation occurs in the bridge, where quarter notes leading to a held note are found in mm. 35 and 36, 37 and 38, and 43 and 44; mm. 37 and 38 are almost repeated in mm. 45 and 46, but the rhythm is changed and the syncopation that marks all these statements occurs in the middle of the measure rather than at its end. Were all these cases included in category X, it would have a total of twenty members.



If we tried to define this category in terms of necessary and sufficient conditions we might be hard pressed to come up with a description that would cover all twenty of its potential members. We could define the category more restrictively and thereby eliminate some of the less viable candidates, but this would yield a rather unimaginative interpretation of how materials are related to each other in this tune. A more promising possibility would be to approach the category as having a graded structure. The most typical member of this category has four features: (1) it begins with a succession of quarter notes; (2) it spans two measures, with one harmony per measure; (3) stepwise motion between pitches predominates; (4) it ends with a whole note. Members that lack some of these features, such as the cadential gesture first heard in mm. 11-14, can be included in the category but will be less typical of the category as a whole; members that lack more features, such as those heard in mm. 7 and 8 or in the B section, will be regarded as a poor fit for the category or even excluded from it altogether.

Many of these distinctions will seem trivial to the analyst who is able to contemplate the score at leisure, moving back and forth between its sections and comparing its various features with cool regard. But we must remember that a listener cannot transgress temporal bounds as easily as does an analyst: she must make sense of the music as it unfolds over time. With this in mind, consider the elegant pattern that emerges as members of category X appear over the course of the tune. The category is introduced early on, its first member appearing in mm. 3 and 4. The basic features that distinguish members of the category are immediately confirmed by mm. 5 and 6. Although m. 7 begins as a typical member of the category, it is cut short, another possible category member interrupting it in m. 8. There is then a brief respite, and when the category is recalled by the cadential gesture of mm. 11-14 the recollection is imperfect. We are taken through this entire process again by the second A section, but in the B section it is abandoned. What is left of category X is only the sort of vague reminiscences offered by mm. 35 and 36; by mm. 45 and 46 there is hardly any resemblance at all. And then the A section, with its thoroughly typical members of category X, returns, and the entire tune comes to an end. The pattern – both within each A section and within the tune as a whole – is to begin with a clear presentation of typical members of the category, follow this by moving to the edge of the category, and to

conclude at a point midway between the two. I would like to propose that, to the extent that the category that is involved here consists solely of musical materials, this process is a specifically musical one. While it is analogous to processes that happen in other domains, this particular process involves the disposition of non-linguistic sounds that are organized into a category that unfolds over time.

Thus far I have identified two different processes that emerge as *The Way You Look Tonight* unfolds. The first, and more concrete, set of processes were associated with our construal of the basic materials of the tune; the second, and more abstract, process concerned patterns of typicality among members of category X. I have correlated these processes with aspects of human categorization for which there is robust empirical support. I propose that they are also connected with two different ways of viewing the structure of this tune. The first, focused on the structure of the phrase, is quite similar to traditional accounts of phrase rhythm. The second, centered on category X, is very similar to the sort of motivic analyses with which we are all familiar. I would now like to turn to yet another view of the structure of *The Way You Look Tonight*, this one provided by Hall's solo chorus from his 1975 live recording.

### ***Improvisation, Categorization, and Structure***

The upper line of example 2 provides a transcription of Hall's solo, which starts just after a solo chorus by bassist Don Thompson; the lower line provides a version of the tune drawn from the lead sheet of example 1, but arranged in 3/4 time. What I like about Hall's solo is the integrated gestures it presents, the quicksilver turns it takes, and its clear projection of the overall form of the tune. Having said this, I want to emphasize that I regard the solo as the product of improvised practice, and that as such it can be hazardous to agonize over its details. The solo was created as part of a set of live musical interactions – it was not created to become a fetish object for musical analysis. Nonetheless, I believe it reveals important things about the organization of live musical interactions, especially where musical structure is concerned, and it is in this spirit that I want to explore it further.

all's solo

original tune

7  $G_m7$   $C7$   $F7$   $B7$   $G_m/B^b$   $C7$

13  $F/C$   $B^b/C$   $A_m/C$   $G_m/C$   $F$   $D_m$

19  $G_m7$   $C7$   $F$   $D7$   $G_m7$   $B^b$   $C7$

25  $F7$   $B7$   $G_m/B^b$   $C7$

30  $E^b7$   $A^b$   $F7$

35  $B^b M^7$   $E^b 7$   $A^b$   $F^7$   $B^b M^7$   $E^b 7$

41  $A^b$   $B^7$   $E^6$   $E^b 7$   $A^b$   $D^7(\sharp 9)$

47  $G^7$   $C^7$   $F$   $D^M$   $G^M 7$   $C^7$

53  $F$   $D^M$   $G^M 7$   $C^7$   $F^7$   $B^7$

59  $G^M/B^b$   $C^7$   $F/C$

65

Transcription by Paul Thomas

Ex. 2: Transcription of Hall's solo over *The Way You Look Tonight* from his 1975 recording, and arrangement of the lead sheet in 3/4 time

Although I have remarked on the integrated gestures of Hall's solo, on looking over the transcription it is hard to see at first glance what conveys this impression. What we see instead is a mixture of materials, including scalar passages, arpeggios, and fragmentary motives. While there are a few longer gestures, such as the ascending scale of mm. 13-17, the descending passage of mm. 24-27, and the oscillation around C5 in mm. 53-56, for the most part the solo seems stitched together from fragments. It is only when we correlate Hall's melodic line with the harmonic framework of the tune that things start to fall into place. A prominent feature of this framework is the harmonic progression of the first four measures – what jazz players would call a I-vi-ii-V progression. Although Kern, in his original harmonization, leaves this pattern behind after m. 8 when he pauses on the F<sup>7</sup> chord of mm. 9 and 10, one *could* harmonize almost the entire tune with the pattern, changing only for the modulations into and out of A<sup>b</sup> in the B section. Hall hints at just such a perspective with the introduction he plays on this recording, which simply cycles through four slightly varied statements of a I-vi-ii-V progression. Although Hall and Thompson's harmonization breaks up regular statements of the I-vi-ii-V progression, and so follows Kern's lead, what remains are the regular appearances of the tonic chord every four measures. These regular appearances of tonic provide a contextual framework for Hall's solo, marking out the boundary points for relatively self-contained gestures. In mm. 1-4, for instance, Hall is occupied primarily with descending lines; in mm. 5-8 he exchanges these for a short ascending run that leads to a stripped-down syncopated figure. In mm. 9-12 Hall begins with little more than fragments, but then turns to a longer succession of pitches that hint at a grouping of two quarter-notes' duration. He concludes the section with the ascending scale of mm. 13-17 that I noted above.

While concentrating on a limited set of materials within each four-measure unit allows Hall to create coherent gestures, there remain two problems: first, unifying these gestures into a cohesive whole; second, connecting them with the topic of the improvisation – that is, Kern's *The Way You Look Tonight*. Hall solves both problems at a single stroke through references to the pitches from the original tune; most of these references are to pitches that begin four-bar units. A few of the places where Hall uses the same note as the original melody include m. 9, m. 17 (an octave higher), m. 29, m. 33, m. 41, and m. 61; all of these pitches

mark the beginning of a four-measure unit. There are, in addition, a number of clear allusions to the note that typically occupies the beginning of a four-measure unit – for instance, in m. 13, where the arrival on the F of the melody is delayed by a quarter note; m. 25, where the arrival is delayed by an eighth note; and m. 49, where Hall's solo begins with an inversion of the melody's descending fifth, which also delays the arrival of the melody's C by a quarter note. In almost every case, the pitches from the original melody to which Hall makes reference serve as arrival points for gestures begun in the previous four-measure unit; each also marks the moment when Hall takes up the new materials that he will explore in the next four-measure unit.

More could be said about Hall's solo, but I want to consider just one further aspect, which is the function of the various four-measure units. In most cases the first four-measure unit of each section of the tune functions as it does in Kern's original: as a point of departure for the section as a whole. The last four-measure unit functions as the complementary point of arrival, recalling the cadential arrival that coincides with this moment in the original tune. In Hall's solo, the middle two four-measure units are given the function of destabilizing the materials set out in the first four-measure unit, and thus setting up the sense of arrival associated with the last four-measure unit. They do this predominantly through rhythmic disruptions associated with syncopations or through what Harald Krebs has called grouping dissonance.<sup>9</sup> The prominent exception is the B section: here the functions I have just mentioned are much less noticeable, and rhythmic disruptions are more prominent, suggesting that this section serves the purpose within the tune that the middle two four-measure units serve within each A section.

I would like to propose that the various four-measure units that make up each section of *The Way You Look Tonight* serve as basic musical categories through which Hall organizes his solo. These categories are distinguished from one another in two ways. First, each four-measure unit is correlated with the corresponding unit of the original tune. In Hall's solo, this correlation becomes explicit when he refers to the pitches that initiate four-measure units in the original tune. Second, within the A sections each four-measure unit is distinguished by its function within the whole. Although these functions are not as evident in the B section, it can

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9 Krebs 1999.

be argued that this reflects the purpose of the B section, which is to provide a contrast to the A sections.

What, then, is revealed about the structure of *The Way You Look Tonight* when it is illuminated by recent research on processes of categorization? Well, it depends. If we are an analyst interested in the structure of phrase rhythm, we can see a succession of basic-level categories that comprise familiar processes – the presentation of musical material, its elaboration, and cadential closure – instantiated by the music of mm. 1 through 14. If we are an analyst interested in motivic structure, we can see a play of typicality effects among the members of what I have called category X, the prominent melodic motive of mm. 3 and 4. If we are a musician interested in structures on which to improvise, we can see a series of four-measure units which, in most cases, have distinctive functions and which in all cases are correlated with melodic features of the original tune.

## Conclusion

My focus in this article has been on what research into processes of categorization can tell us about musical structure, with the understanding that categorization is only one of a number of general cognitive capacities that we use to organize our understanding of music. I have used this perspective to present three different, although related, views of the structure of Jerome Kern's *The Way You Look Tonight*. These three views do not exhaust the possibilities for describing the structure of this tune, but they do point to certain key elements that any adequate account of the work must acknowledge.

I should note that one thing that was not always clear was the standpoint from which the analysis was made: is it that of the educated listener, the composer, the improviser, or the music theorist? This lack of clarity follows, rather curiously, from the basic perspective I adopt: processes of categorization are not the sole property of any one of these agents, but are common to all. This is not to say that these viewpoints cannot be distinguished from one another, but to do so would involve a foray into conceptual models beyond the scope of the present article.<sup>10</sup>

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10 For a discussion of conceptual models in this connection see Zbikowski 2004.

I also want to emphasize that I do not think the sorts of things that I have said about *The Way You Look Tonight* are startlingly new. Indeed, many of my observations have been commonplace ones, which could have been made by even a casual student of this music. What *is* new is the connection of these observations to a systematic account of how knowledge is organized, based on recent work in cognitive science. This connection is a first step in providing a firmer grounding for the discipline of music theory, for it suggests that the origins of musical structure can be found in the ways humans organize their understanding of music. It also suggests new directions for music theory: if we can expand our idea of musical structure beyond what has been bequeathed to us by the composers and theorists of eighteenth- and nineteenth-century Europe, the possibilities for analyzing popular music, post-tonal music, and the musics of different ethnographic and historical populations increase considerably. Musical structure is not simply a reflection of the tonal practice of Haydn, Mozart, and Beethoven, but is instead an account of how patterned sound comes to have meaning for human beings.

I will be the first to admit that the project of providing an account of how the structure of music reflects human cognitive capacities is an ambitious one. Perhaps it is *too* ambitious. And yet I remain convinced that it is only through such an endeavor that we can provide a firm foundation for the discipline of music theory.

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