

## Using Composition Theory to Analyze a Work by J.S. Bach

by John Reese

A few years ago, when I was working on the reconstruction of several lost Bach cantatas, I struggled to come to grips with what separated the music of Bach from that of other composers. This involved a series of progressively deeper examinations of Bach, of music in general, and, ultimately, the very nature of creativity itself

Emerging from this struggle was the concept of *composition theory*, a system to analyze musical works and try to understand the thought processes that led to their creation. While developed to understand the music of a specific composer, it has proven to be flexible enough to apply to any type of composition, and is useful as well in the creation of new works.

Composition theory divides the problem of musical analysis into two domains; the creative and the architectural. These domains are defined by two concepts called, respectively, the *creative space* and *music architecture*. In many ways, these concepts are simply two different ways of looking at music composition. On the other hand, there is a tension between the two that presents the composer with numerous dilemmas to solve during the composition process.

The creative space is a conceptual model that can be envisioned as a three-dimensional region whose inner boundaries represent the limits of creative expression. In the case of music, creativity is limited by the perceptual range of the human ear, the physical properties of sound, the capabilities of the composer's chosen media (instruments, voice, and other sources of sound), and many cultural considerations.

The concept of the creative space was inspired by the *adaptive space*, a tool used by evolutionary biologists to visualize the complete set of environmental niches in an ecosystem.<sup>i</sup> The creative space is similar, but instead of environmental niches there are *opportunities for creative expression*. Although some opportunities are limited in an absolute manner, being constrained by physical laws, others are far more malleable. Cultural limits in particular can be pushed aside by new ideas, a process which reshapes the creative space as time goes by.

The architectural domain of composition theory is defined by music architecture. This concept is based on the idea that compositions are constructed from a complex system of *profiles*, which define changes in *energy*. The word "energy" in this context refers to the psychological perception of interest, excitement, or unrest in a musical idea.

The simplest profiles are made up of primitives, which are irreducible musical elements. A single pitch, a single duration, a single volume, or a single tempo are primitives. A primitive on its own cannot express a change in energy. When two or more primitives combine to create a change in state over time, they form a profile. If these primitives remain static over time, then the profile is said to be flat.

Profiles may also be formed from a combination of smaller profiles. For instance, a change in pitch over time can form a profile that also forms the basis of a melodic theme. Imitation of that theme can form another profile that expresses a change in energy over a larger scale.

Perhaps the easiest profiles to understand are those concerning tempo and dynamics. Clearly, moving from a slower tempo to a faster one represents an increase in energy, as does a dynamic crescendo. Reversing the process, naturally, decreases the energy. It is this change over time that is central to the concept of a profile.

In addition to dynamics and tempo, there are rhythmic, melodic, harmonic, and tonal profiles. In fact, any musical thought imaginable can conceivably be used to form a profile. The only requirement is that it can describe the buildup and release of energy as it changes over time.

A very loose interpretation of the relationship between the creative and architectural domains is that one reflects the content of a composition, while another represents the form. In practice, however, there is some overlap. There are formal elements to creativity, just as there are architectural elements that give rise to musical content. This type of enmeshment between the domains appears again and again and helps drive musical decisions that lead to the creation of new compositions.

This introduction has been brief, but applying the model to an actual composition will help clarify the concept. One of the lost cantatas whose reconstruction I had undertaken was a setting of the German Magnificat, *Meine Seele erhebt den Herrn*. This libretto was a paraphrase of the original text of the old Lutheran chant, *Meine Seel' erhebt den Herren*. Bach also set this text to music when he created BWV 10, a cantata that I carefully studied in order to understand how he might have approached the lost work. We will examine the opening chorus of this cantata next.

### **BWV 10 from the Creative Domain perspective**

The creative space, since it is defined by its boundaries, serves to limit creative expression. However, it also shapes it, providing recognizable definition out of the chaos of possibilities. As Bach set out to compose the opening chorus of BWV 10, he was first constrained by the conventions of the western system of harmony. Next, he was forced to make do with the somewhat meager performance resources at his disposal in Leipzig. Finally, he was faced with two self-imposed restrictions; namely, use of a specific text and a specific melodic theme. BWV 10 is a classic chorale cantata, in which the bulk of the music is essentially variations on a given chorale melody.

*Meine Seel' erhebt den Herren*, however, is no ordinary chorale melody. In reality it is a chant, somewhat smoothed out rhythmically, but essentially unchanged from the original. For this reason its mode is somewhat ambiguous, flirting with both major and minor before finally settling down to a minor cadence. This ambiguity gives the opening chorus, and indeed the entire cantata, a somewhat earthy and primitive feel. This is in stark contrast to the better-known Latin *Magnificat in D*, written some years earlier.

Let us look at the text of the opening chorus:

**Meine Seel erhebt den Herren,**  
*My soul praises the Lord,*  
**Und mein Geist freuet sich Gottes, meines Heilandes;**  
*and my spirit rejoices in God my saviour;*

**Denn er hat seine elende Magd angesehen.**

*for he has looked upon his wretched handmaiden.*

**Siehe, von nun an werden mich selig preisen alle Kindeskind.**

*See, from now all children's children will praise me as blessed.* <sup>ii</sup>

It is well known that one of the most potent creative sparks for Bach was tone painting based on textual imagery. It should therefore be helpful to look for any correlations between the text and the character of the music. The lines of text used in the opening chorus describe two diametrically opposed states of mind: On one hand, joy and praise, and on the other hand, humility and awe.

A “humility” motif appears near the end of the ritornello:



The augmented second relationship between the fifth and seventh notes is reminiscent of the “bowing and scraping” theme heard in the obbligato of the *Quia respexit* of the *Magnificat in D*. The downward-trending melody and large downward leaps evoke an image of someone prostrating themselves in humility. While this corresponds with the last two lines of the text, the idea of rejoicing and praise can be seen in the wide leaps earlier in the piece:



In this case, the correspondence seems a little more tenuous. It is likely that there are other explanations for the jagged melodic contour here. This will be discussed later.

Another voluntary restriction Bach placed on himself was the adherence to a very specific genre, the Pachelbel-style chorale chorus. This is characterized by a protracted cantus firmus in one voice, punctuated by declamatory figures sung by the other voices. This counterpoint to the cantus firmus is in many ways similar to a recitative, in that the melodies are not particularly tuneful but instead emphasize the words being sung, while at the same time providing a harmonic context.



This brings us to one of the most important restrictions that shaped the music of Bach, and that is the

musical abilities of his performers.

Johann Adolph Scheibe famously derided Bach's composition style as follows:

Since he judges according to his own fingers, his pieces are extremely difficult to play; for he demands that singers and instrumentalists should be able to do with their throats and instruments whatever he can play on the clavier.<sup>iii</sup>

Johann Abraham Birnbaum came to the defense of Bach, countering with the argument that the difficulties of playing or singing Bach's music can be overcome by industrious practice.

To my mind, both men missed the mark. The implication was that Bach wrote for voices just as he did for the clavier, without taking into consideration the differences in capabilities. This is demonstrably false.

There is an element in creativity that I call *generative style*. Generative style makes reference to the mechanism that shapes a new idea, the source of inspiration, if you will. Generative style in melodic construction runs the gamut from *organic*, which is what we might think of as “pure” or lyrical melody, and *mechanical*, which is influenced by the capabilities and limitations of specific instruments. At one extreme we have pure aestheticism, while at the other end of the spectrum we have pure pragmatism. Generally, vocal music can be expected to be organic in style. This style is “singable”; it stays within a fairly restricted range, it employs more steps than skips, and it can be broken up into fairly small phrases.

The point is that when Bach wrote instrumental parts that were similar to the vocal parts within the same composition, he was employing organic generative style. He was hardly pushing the instruments to their limits, and was in fact toning down the melodic structure to accommodate the voices.

Bach's music that was truly written for a specific instrument carries with it the unmistakable ergonomic signature of that instrument. It is difficult, for instance, to imagine the following to be played by anything other than the clavier:



Much of Bach's clavier music fits under the fingers smoothly and fluidly, while any attempt to play it on another instrument would be awkward. The same is true of his most challenging pieces for solo violin.

At any rate, the notion that Bach wrote for voices just as he would for the clavier is easily falsified by this passage from the opening chorus:

At first glance, it seems that the bass part is actually more difficult than it would have been if it directly copied the continuo, because there are more notes. However, the vocal version is more singable. Notice the repeated notes in the continuo part, starting with the third and fourth notes. While this type of repetition on a cello is simply a matter of reversing bow direction, and on the clavier of switching fingers, in singers it requires an uncomfortable glottal stop. The strategic placement of a single sixteenth note in each repetition of the motif solves this problem without distracting the ear from the “two shorts and a long” rhythm that is characteristic of the continuo line throughout the piece.

Add to this the adjustment of the first few notes to place it in a more comfortable range, and it is clear that Bach gave careful thought to his vocal writing.

This careful thought seems to have gone out the window at the section where the second statement of the cantus firmus completes. Here, the vocal parts become quite uncharacteristic of Bach:

This line was seen in the opening ritornello, and is somewhat similar to the declamatory style mentioned earlier to accompany the cantus firmus. At this point, though, the cantus firmus has run its course. When I see a somewhat awkward vocal line like this, I usually look for some contrapuntal device that requires such melodic gymnastics. It doesn't take long to find it: This excerpt is the opening entrance of a brief four-part canon at the fifth, a quite difficult structure to implement even for someone of Bach's talent. The tension between the need to imitate the subject in four different keys and the need to follow good voice-leading practices explains the un-vocal nature of the excerpt. Likewise, the need for the four-part canon explains the need for an uncharacteristically difficult vocal part here.

Was the use of the canon just a contrapuntal gimmick, or did Bach have a particular reason for inserting it here? Up until now, we have looked at the piece solely from the creative perspective. Now, we will attempt to answer the question by looking at the architecture of the piece.

### **BWV 10 from the Architecture Domain perspective**

As described before, music architecture breaks down a composition into profiles that describe how energy is built up and released during the course of a performance. One of the factors that distinguishes one piece of music from the rest is the emphasis placed on certain types of profiles by the composer. For instance, some compositions, such as passacaglias and chaconnes, have a flat tonal profile,

meaning that the key center never changes.<sup>iv</sup> In this case, other types of profiles are emphasized more than they normally would, particularly the rhythmic profile.<sup>v</sup>

Grasping the concept of architectural profiles becomes easier when viewing a composition in terms of flat profiles. Elliot Carter's études for woodwind quartet are an excellent illustration of this. Among the études is one with a flat harmonic profile, another with a flat thematic profile, and even one with a flat melodic profile. In studying these works, it became clear how, in the absence of one type of profile, other types can be utilized to fill the vacuum.

Identifying the flat profiles of the opening chorus of BWV 10 is a good place to start the analysis. In particular, the piece is flat in terms of dynamics (although in practice there would be local fluctuations in dynamics as part of the normal application of musicality). It is also flat in terms of tempo and, for the most part, rhythm. The incessant "two shorts and a long" rhythm of the continuo, mentioned earlier, establishes a perception of constant rhythm throughout the piece. Again, however, there are local fluctuations in rhythm that provide tension between the cantus firmus and the accompanying parts. This tension is characteristic of the genre, and creates energy when the choir is singing.

In terms of timbre, the piece is very nearly flat as well, since most of the instruments play continuously. The exceptions are the voices and the slide trumpet, which are used for only about half the duration of the piece in total. Put together with the local rhythmic profiles mentioned above, this places emphasis where it belongs, on the chorale tune and the text for which it serves as a vehicle.

Now we move to the most interesting architectural feature of this piece, the tonal profile. In terms of key center, energy is usually built up by moving forward in the circle of fifths, and released by reversing the process. Something about the tonic-dominant key-center shift is perceived as an increase in tension. Whether there is an innate psychological reason for this or it is simply a result of cultural expectations is a topic for another time. The relationship between energy and tonal direction in the circle of fifths is clearly present in the music of Bach and his contemporaries.

This, then, makes it somewhat puzzling when Bach chooses to move from G minor in the first verse of the chorale to C minor in the second. It is an uncharacteristic lessening of energy halfway through the piece, when one would normally expect a buildup of tension in preparation for the finale.

Here is where the four-part canon comes in. The canon, in effect, pushes the key center relentlessly forward in the circle of fifths within the course of just a few measures. Suddenly, after a brief flirtation with F minor, we go all the way to D minor, one step ahead in the circle of fifths from when we began. At the same time, energy is built up with a textural profile, as the counterpoint suddenly becomes more complex. Having achieved its tonal pinnacle, the piece can then settle peacefully back into G minor, resolving the tonal energy in a manner that is highly idiomatic of Bach.

Now, let us return to the creative domain and see how all the elements come together.

First, the key change from the first verse to the second makes perfect sense from a textual standpoint. Recall that the first verse is about joy while the second suggests humility. It is quite logical, then, to lessen the tension here by falling to the sub-dominant key center. Bach normally wouldn't take this approach, because it creates the problem of where to go once he has voluntarily forfeited some of the energy he needs to reach a satisfying conclusion to the piece. However, the need to make the music

match the text is great enough that he was willing to create this difficulty for himself.

This is an example of the tension that sometimes arises between the creative and architectural domains. The willingness of a composer to create this tension and his ability to resolve it is a significant indicator of his skill as a craftsman.

Near the end of our piece, Bach dug his way out of the self-imposed difficulty by employing the four-part canon at the fifth. This explains the canon from an architectural standpoint, but is there a creative explanation as well? Again, we look at the text to see where he might have drawn inspiration:

### werden mich selig preisen alle Kindeskind.

*all children's children will praise me as blessed.*

The image shows a musical score for a four-part canon in G minor, BWV 10, measures 68-72. The score is for Soprano (S), Alto (A), Tenor (T), and Bass (B). The lyrics are: "wer-den mich se - lig prei - sen von nun an von nun an wer - den mich se - lig prei - sen von nun an von Kin - des Kind. al - le Kin - des Kind. von nun an werden mich se - lig". The score is in 3/4 time and features a four-part canon where each voice part enters in a different voice and then repeats the same melody in the next voice, creating a recursive structure.

The recursive idea of “children's children” clearly suggested, in Bach's mind, the employment of a recursive musical device: the four-part canon mentioned earlier. The canon not only serves to correct the key center problem, it also suggests the idea of one generation giving way to another, then another, then another, each greater than the previous one. The concept of “descent” is likewise conveyed by each entrance progressing from soprano, to alto, to tenor, and finally, bass. The resulting music is the perfect expression of this completely non-musical idea.

## Conclusion

In the opening chorus of BWV 10, Bach took a highly formulaic and arguably overused genre and added a whole new dimension to it. The manner in which he was able to juggle so many conflicting considerations is masterful, to say the least. The different elements are so closely intertwined, it is difficult to say whether the chicken or the egg came first. Did Bach conceive of the canon first, then work backwards to the sub-dominant key change, or was the canon introduced as a way to correct the odd tonal structure? Did the creative considerations drive the architecture, or was it the other way around? Or, was there a complex feedback mechanism at work? It's impossible to say for sure. One thing is certain, though: studying one of Bach's pieces at this level leaves no doubt that his reputation as a great composer is completely justified.

In my reconstruction of the second German Magnificat, I ultimately decided that Bach probably would not take the same approach as he did to the first one. The style of the resulting project was thus much closer to the *Magnificat in D* than to BWV 10. Nevertheless, the analysis I performed on BWV 10 proved to be well worth the effort. De-constructing a masterpiece like this one, “unweaving the

rainbow”, so to speak, could only add to the awe and esteem that I hold for this great master and his music.

- i “Only a Theory”, Ken Miller
- ii Translation by Francis Browne, contributed to [www.bach-cantatas.com](http://www.bach-cantatas.com)
- iii “The New Bach Reader”, edited by Hans T. David and Arthur Mendel
- iv In addition to the flat profile, there is also the concept of a “null” profile. An example of a piece with a null tonal profile would be a twelve-tone serial composition.
- v “Rhythmic crescendo” is a term used to describe the building of energy through a rhythmic profile by introducing progressively smaller note durations, creating the illusion that it is speeding up when in fact it is flat in terms of tempo. It is a key device to maintain interest in tonally flat pieces.