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Negative Harmony: Experiments with the Polarity in Music

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Abstract

I set out to experiment and justify the use of a new theory called Negative Harmony in 21st century music. Negative Harmony is a musical avenue from which composers can glean new tones within traditional music theory rules. I took inspiration from the current leading authority on the topic, Jacob Collier, as well as older scholars from the 20th century, such as Ernst Levy and George Rochberg. I conducted research on the theory by finding its relation to major and minor chords, and how these mirrored chords worked from a theory standpoint. I then composed two original works, one piano piece and one piece for SATB choir and piano. I aimed to find the best balance between the unfamiliar negative chords and the familiar positive chords. I then looked to justify the use of this theory through the writings of scholars and modern music listeners and casual music makers.

Negative Harmony: Experiments with the Polarity in Music

One night, after a long day of work, I came home to my wife, and we proceeded to talk, as we always do. This particular night, she told me of this thing called Negative Harmony. I probably said something like, "that sounds fake, there is no such thing as Negative Harmony" in that moment. However, she pulled out her phone, opened up Spotify, and began to play a song by a man named Jacob Collier. The song, "Close to You," was strange to me. The chords did not sound dissonant, but definitely did not sound normal. The tempo was sporatic and did not follow any sort of steady pulse, and over all, the song gave me a sense of anxiety from the lack of structure. I believe the next thing I said was, roughly verbatim, "I hate this." My first response when hearing something strange and "out there" was disdain.

But then I started thinking about the concept of Negative Harmony, and within the span of about a five minute conversation, I went from "I hate this" to "there may be something to this." The concept began to make sense to me. The music, however, did not. The next thing she played for me was a Negative Harmony cover of "In the Bleak Midwinter" by the same person, and I just could not help but feel uncomfortable at this bizarre take he took with it.

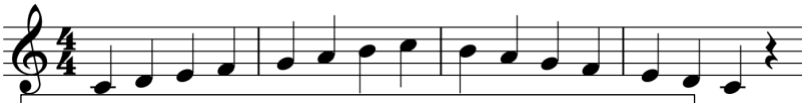
As I spent time studying Negative Harmony and learning more about Jacob Collier as a composer, I began to realize that my initial reaction to the music was poor and close-minded. The music is unique, and Collier has definitely got an incredible talent, with a much broader and interesting viewpoint on the subject of Negative Harmony than I thought when I started writing this paper. Although the music was strange to me at first, I overtime began to gain that broader viewpoint that Collier already had. One of the main themes of my whole journey through this

study is that I should be open to music I have not experienced yet, that is foreign to me, because I may find a new favorite style of music in that pursuit. I do not explore this theme much within the paper (it is dense enough to award a thesis of its own), but I have a new understanding and appreciation for the music that sparked this thesis in the first place.

The theory works very well when it walks alongside our modern rules for music. Major, minor, the harmonic sequence, chord progressions, this is where Negative Harmony belongs. I intend to expand upon the rules we all know and understand, in order to give music makers a new set of tools to use to get across the emotions they feel, without ignoring the tried-and-true methods already determined by the giants of past generations.

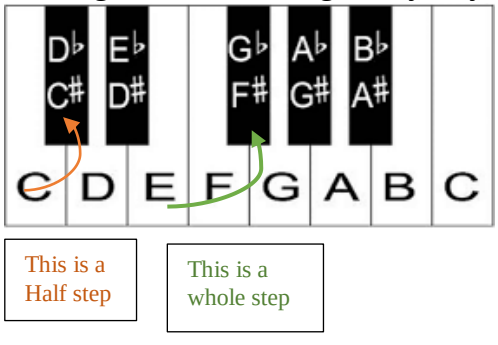
Theory

Negative Harmony is, at its very core, a concept centered around rules that many of us already know. So, in order to understand it fully, one must understand its roots. So, to begin, I want to give a brief overview of where we have come from.



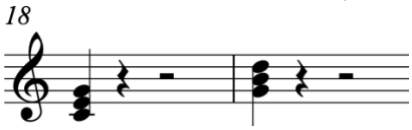
The key of C, which starts on C and travels upward to C, then back down

Modern music is almost entirely based on the major and minor scales. Any song you hear on the radio, as well as a lot of contemporary choral music is written in either a major or minor scale. These scales consist of eight notes, which start at the tonic, and proceed up to the tonic again, an octave higher, by way of what is called stepwise motion. A half-step is the interval between two notes right next to each other on a piano keyboard, such as C and C sharp, or E and F. A whole-step is twice that distance, so C to D, or E to F sharp. This stepwise motion will be very important for our purposes in terms of Negative Harmony.

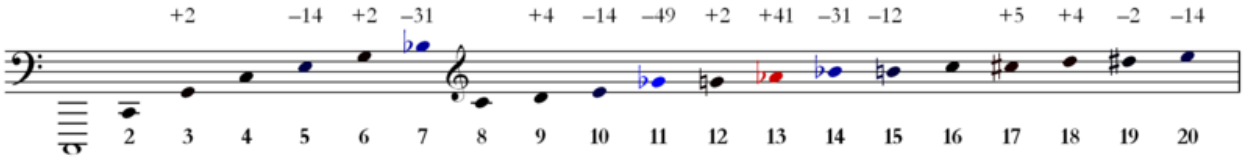


Each key has a different stepwise motion you take in order to spell out the notes in the key. For major scales, that stepwise motion is Whole Whole Half Whole Whole Whole Half. This is the basis for our key structure. Other scales have modified stepwise motions in order to get a different sound. This knowledge will also tell you what basic chords will be in the key: for example, in the key of C, the chord F# is unnatural because the note F# never appears in the key of C. There are ways that one can analyze the F# chord and potentially have it make logical sense, but overall that chord would be avoided without some form of modulation, or changing of the key within a song, or perhaps a deliberate disregard for the tonal center.

Furthermore, there are many chords within each key. A typical chord will consist of three or more notes, often spelled as the tonic, a third, and a fifth. For example, take the tonic, let us say C, followed by the third above that, E, and then the fifth, G. This is a C-major chord. In a major scale, there is a tonic for the key, such as the letter C in the C major scale, and then also a tonic for the chord. In the fifth chord in the key of C, the tonic would be G, because the fifth note in the key of C is G, and the chord would be spelled G, B, D (a third and a fifth above G).



A C Major chord, followed by a G Major Chord



The concept of the harmonic series is also important for us to understand (pictured above). This is a naturally occurring phenomenon that you get by plucking a string, and then cutting the string in half and plucking it again. The sequence goes as such: note, perfect octave, perfect fifth, perfect fourth, major third, minor third, and the interval gets smaller and smaller. This also presents a series of overtones based on the same intervals: any time we hear a note, we

are not just hearing that one note, but a conglomeration of notes based upon this harmonic series. Without the harmonic series, such as when certain midi programs play a note, the note actually will sound robotic and strange; that is because we are used to hearing the full picture. This concept is important because it informs us on why our chords are structured the way they are. If we look at a piece of tonal choral music, we can see that the chords are built in a way to roughly fit around the harmonic sequence.

Chords are very important for the creation of modern music, but another important aspect is the way we analyze the chords. While there are a set of chords in which a key naturally sits, there will also be plenty of chords in relative keys that we must account for. For example, in the key of C, a D Major chord would not naturally occur due to the fact that the F# is not in the key. Depending on the context, this can either be seen as a modulation, in which the key changes for a stretch of time, or it is simply the V/V, meaning that you have played the dominant of the dominant. D is the fifth of G, which is the fifth of C, which is where a D major chord would arise. So, chords with accidentals (sharps/flats) in a certain key can usually be described as being related to a chord in a different key that is closely related to your base key.

The chords may not always look the same, or even sound the same. Not all C Majors are created equally, and this gets into the idea of inversion. An inversion of a chord is when we take the root of the chord, usually the bottom note, and move it somewhere else. This makes whatever the bottom note is after the movement the “root”, although the tonic is still the same note. If we have a C Major chord, C E G, you may see it as E G C or G E C, from bottom to top. These are called inversions. The reason we use them is to make fingering on guitars and piano, and even voice leading in choir music, easier; as well as to create a different sound, which is significant on its own because it is the same three notes. A chord with the tonic as the bottom note is

considered in "root position," a chord with the third as the bottom is considered in "1st position" and a chord with the fifth in the bottom is considered in "2nd position."

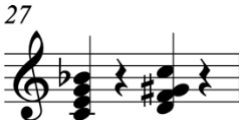
One more concept about chords should be touched on, and that is the concept of brightness. Brightness is defined by jazz bassist Adam Neely as the "relative size of the intervals in a chord or scale" (Neely, 2016). For example, if we have a C Major chord and a C Minor chord, the C Major chord is litereally brighter than the C minor because of the difference between the major and minor third of those chords. An augmented chord is brighter than a major chord, and a diminished chord is darker than a minor chord. The reason this is useful is because it gives us a tangible way to talk about the tone of a chord without becoming too subjective. To clarify, just because a chord is brighter than another does not mean it is going to sound "happier" necessarily, and the augemented chord is a good example of a subversion of that expectation. A good balance between brightness and darkness in this definition is key to the creation of music that sounds more "expanded and consonant" as apposed to "contracted and dissonant." But, of course, the emotional response someone gets from a chord is largely subjective, so we can use brightness as a way to hint at what a composer was likely trying to convey.

So, with some basic knowledge out of the way, we can get into the heart of Negative Harmony. To understand Negative Harmony, it helps to have a keyboard nearby when experiencing this for the first time, in order to be able to play the chords and hear the difference that it makes to the sound.

Negative theory is based originally on the work of Ernst Levy, a musicologist from Switzerland, who had *A Theory of Harmony* published in America in 1985, four years after his death (Dubal, 2004). He speaks largely on the polarity theory in music, also known as reciprocation, or recreating an interval in the opposite direction. He differentiates it from

inversion, which is using the same notes in the opposite direction. There is a certain polarity in this reciprocation, a mirroring about a "pole" of sorts. (Ernst Levy, 1985, p. 6) This is the whole basis of Negative Harmony. The concept focusses on that polarity, that reciprocation, of reproducing intervals to get a different tone going down instead of up. This theory, which Levy based on other scholarly works, has continued to grow into the theory of Negative Harmony.

Imagine taking an object, I will say a phone, and put it perpendicular to a mirror. Now turn the phone on and look at the image. You will probably see the time, a picture of something you like to look at, maybe a notification of a text message or some app. Now look in the mirror. How does the image change? It may be harder to read the text, yes, but the whole image takes on a new perspective. Negative Harmony is the process of taking a predetermined musical engine, the most prominent being the chord, and inverting, or mirroring it, on an axis of our own determining. In the phone example, the mirror is literally the mirror, and the axis that we have chosen is the bottom of the phone. Let us see what that looks like for music.



A C7 chord, followed by a C-Major Chord. The C7 is spelled up from C3 while C- is spelled down from C4, as it would occur naturally in this theory. Generally I would spell it up from C, because C is still acting as the tonic.

In order to build the chord C7, we take four half steps, or two whole steps, to get to the major third, and three more half steps to get to the perfect fifth, and finally three more half steps to get to the minor seventh, giving us C, E, G, B ♭ . In order to get the negative chord, we take those same steps going down from an axis, in this case the tonic C. Two whole steps down will give us G#, three half steps to F, and three half steps to D. This chord has its own interesting set of properties with which to relate it to the major chords. Note that I used the C Major 7 to mirror, that is because without that last chord number, the mirrored chord is not all that bizarre. The chord C, F, G# is an F minor chord, which would be much more common in C. It is the D that throws it off, as with the other mirrored chords. It should be noted that the axis does not need to rest on an

actual note, but can be in between notes. If you were to mirror the C7 chord C E G B ♭ around an axis placed between a B and a C, you would get B G E C#, which is quite a different result from the first one.

Firstly, this chord, as with any chord in negative, has a strong pull toward its positive inversion. The D (the second of the positive), F (the fourth of the positive), and G# (augmented fifth of the positive) each have a pull toward E (for D and F) and G (for G#) in order to "resolve" the chord. Playing with this draw is the basis of creating tension and emotion with Negative Harmony, just as playing with draw (or "expectation") is a very large component of a lot of music.

These chords that we get are not natural in the positive key we derive them from. D, F, G#, C is a diminished seventh chord in the key of E♭. Since E♭ does not occur in the key of C, this chord is unrelated to our key. This makes the very usage of them unique within 21st century tonal music, but it is not unheard of to make this sort of move, especially if you want the key to modulate for a short time. This theory, however, does not deal with modulating keys, but actually wants to expand upon the key you are already using. Finding the right time to use negative chords and how to make it seem as though the song is not modulating is a limiting factor of the theory of course, but limitation breeds creativity, and so leaning in to this issue is the main focus behind the theory and how it should be used. Plenty of music experiments with freely moving between keys, but Negative Harmony aims to expand our ability to stay in the same key and play with the draw of the chords.

Negative Harmony does not follow the harmonic sequence as closely as more common chords do, but this does not mean that it cannot be used. If we spell a negative C chord from the tonic up like we would a positive chord (which is how I recommend the chords be spelled, rather

than down from the tonic), we would have C, D, F, G#. Speaking of numbers in a positive chord, that is 1, 2, 4, and a sharp 5. Using that information, we can determine where in a chord those numbers should go and how many voicings should be on each number to help with tuning and the formation of the chord, following the harmonic sequence. The sharp five would be the second most important note, followed by the 4, then the 2. Most of your voicings, especially for vocal music, you would want on the tonic, then the sharp five, the four, and the two in that order, in order to make the chord easy to tune.

There are, of course, many different axes around which we can mirror any given musical engine, such as the tonic of a chord, the dominant, the third, the seventh.. I am going to proceed by determining what each of these might be called and giving them symbols, so they can be standardized and recognized easily. This will be useful information to have when it comes to writing chord charts for secular music, a very common practice in the pop and rock scene.

First, we look at negative chords. Say that a chord is flipped on an axis obviously gives us many options for which axis about which to mirror it, so a standardized nomenclature is important. A chord flipped around the tonic will be called a root mirror, a chord flipped around the third will be 1st mirror, and a chord flipped around the fifth will be a 2rd mirror, in order to keep it consistent with the nomenclature laws of inversions. Any of these mirrors can be inverted just like positive chords. If you have a C- in root mirror 1st inversion, it would actually be G#, F, D, C. This may be contrary to what you would expect (you may expect the D to be the bottom note in a 1st inversion), but that is because it is a negative chord being spelled downward naturally. C, G#, F, D is how it occurs naturally, so in order to get a 1st inversion, we would take the G# first. This is where the importance of the “negative” part comes in when we try to understand this theory. While I do recommend spelling the chords up from the tonic like a

positive chord, that is not technically how the chords exist. They exist in a negative state, and embracing that is a part of the theory.

Next, we should determine how the chord should look when analyzed on a sheet of music; since each of these mirrors are creating a different chord, we will need a different chord symbol for each. I propose that, for the root mirror of C7, the chord symbol be C-. For 1st mirror, we will have C-3. For 2nd mirror, we will have C-5. This will, at a glance, tell you what the base chord is, which axis we are using, and therein what notes to play. You will see my sheet music labeled with these chord symbols later on.

Discussion

The thing about Negative Harmony is that, at its core, it is simply a new way of imagining things that are already in our current theory rules. Negative Harmony expands upon them and allows for more flexibility, but offers no "new" ideas, in a manner of speaking. So that begs the question, "Why bother?" Why would one spend time to learn this concept when it already exists in other forms?

I believe the answer lies in history. The idea that new forms and thoughts about music are always emerging is not a new one. Ernst Levy, in his theory of harmony, originally published in the 1940s, said that he had difficulty, from a musical and intellectual standpoint, to believe that the feelings about things like octaves, fifths, thirds, and "the basis of music as we know it" that we currently hold will ever disappear for any reason. He also states that he believes that a "progressive discovery of norms is taking place" at all times, that new rules and feelings about those rules are being produced by music scholars even as we speak, and it is not going to stop just because we cannot, at this time, hear it or experience it (Levy, 1985, p. 60). So Levy said that music was going to continue to grow and change even beyond our sense of hearing, as new

people and new ears are hearing music, writing music, every day. This is an incredibly important note, which came well after the introduction of the atonal movement of the 20th century. But even before then was a movement which showed this to be true.

In 1997, an American Composer named George Rochberg published an essay in *The Proceedings of the American Philosophical Society* titled "Polarity in Music: Symmetry and Asymmetry in Music." As similar as this title sounds to my theory presented here, he is actually referring to the difference between tonality and atonality, symmetry and asymmetry respectively. He talks a lot about how music came to be in the 20th century but starts well before that.

One must remember that music of the past was purely melodic and "symmetrical." were strict rules against certain dissonances, and the text of a piece was far less important than the sound it was creating. This was the Renaissance, but soon the Baroque era would come, and one of the forces for this change was Claudio Monteverdi. Monteverdi is an incredibly influential bridge composer whose music is completely contrary to the music that surrounds him in his time. He coined the term *seconda practica*, or second practice, which was aimed at giving the text of a piece much more meaning, and freeing composers from the rules against asymmetry, dissonance, and the strict counterpoint techniques of the time.

This, as one can imagine, stirred up backlash. Artusi, a composer of this era, said that those composers following this new practice would eventually become so assertive in their style that they would turn consonance into dissonance. He finished by saying that they were satisfied with making these huge walls of sound and confusion, stemming from "the ignorance which keeps them benignted" (Rochberg, 1997, p. 176). What he was essentially getting at was that the *seconda practica* was crass and, dare I say, "ungodly". He is not at fault though, he was just a

pawn of the times, whereas Monteverdi saw a new and important potential for music to move forward.

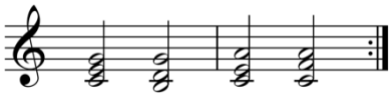
Nowadays, we do not see Monteverdi's music as being all that strange. His music is only strange when considered from the perspective of what came before it. This very same phenomenon can be seen playing out with atonal music sprouting up in the 20th century, pioneered by Arnold Schoenberg. The majority of the people reading this paper will probably say that they do not like atonal music, and I have heard anecdote that Schoenberg's music itself was indeed the worst of it all. But Schoenberg is not all that different from Monteverdi when all is considered. There is simply a difference in time frame involved. Monteverdi and Schoenberg both share a common theme, in that they decided that they were not happy with the rules as they were, and instead wanted to expand them to include music the way they heard it. One difference is that Schoenberg had a larger "vocabulary" to work with.

Things such as key signatures were still a burgeoning concept when Monteverdi was pioneering. Nowadays, we have so many different concepts to work with that people in the Renaissance era did not have, and most likely, would not have wanted. Schoenberg too had many more tools at his disposal, and a much broader knowledge of music as a whole, than Monteverdi could have dreamed of. This does not make Monteverdi lesser, and that is important to remember. But the increasing of vocabulary throughout time has opened up new and inventive ways to create music. Rochberg said that the perspective was growing more rapidly during Monteverdi's time than during any other time before it. Rochberg also warned that this means one should be cautious and serious when imagining and experiencing new vocabularies in music (1997, p. 175). It would be near sighted to think that there are no more new vocabularies to be gained from intense experimentation, and even more near sighted for one to turn their noses up

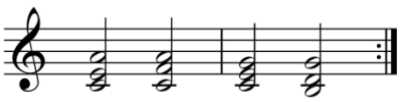
to potential new discoveries. One would not want to be remembered like Artusi, whose most significant contribution to history is that he opposed the baroque style so harshly (Chrissochoidis).

I say all of this because I want Negative Harmony to grow as a new musical language, just like the *seconda practica* or atonal music. Rochberg feels that Western music has been a collective work handed down from generation to generation, and the work is still growing and expanding (Rochberg, 1997, p. 169). Negative Harmony has been pioneered by smaller names in the music scene for some time now, and I can see this trend continuing until the tools it provides become more standardized. The baroque period of music was not solely built on Monteverdi's back, and atonal music was not solely built on Schoenberg's back, but many people have come since then to continue to redefine music. Many of them have heard music in a different way than those before them, and so have acted on that feeling.

Schoenberg got bored with the rules of music as they existed in his time, and a similar trend can be seen even in modern pop music. This has happened for a couple reasons. For one thing, an almost embarrassingly large majority of the popular music we consume contains the same four chords:



I-V-vi-IV



238 vi-IV-I-V

I-V-vi-IV. Just as common is the vi-IV-I-V progression, which uses the same chords in a different order. There's a page on Wikipedia which contains a list of songs that use one of these two chord progressions from the 1970s all the way up to present day, many of which were high on the billboard charts at some point, and there are songs on this list, and it is far from comprehensive. The year 2012

shows up on that list 25 times ("List of Songs…", 2018), and if we assume that every song on that list was in the Billboard Top 100 chart for that year, then that is 1/4th of the biggest songs of that year using this chord progression, and there may well have been more. This chord progression is simple and easy, but at a certain point one may run out of ideas on how to make a song unique with a chord structure present for an unfathomably long time.

Whether you believe this commonality in music is stale or not, the fact of the matter is that is a problem of unoriginality that permeates what happens to be the second and third most listened to genres of music based on a 2018 article from CBS New (CBS News, 2018). There is a term coined by Craig Jenkins in an article on the Vulture titled "The Sound of Modern Pop Peaked This Year — and Now It Needs to Change" which clearly defines this phenomenon: pop centrism. It is a theory that pop music will over time tend towards a norm that is shown to be the most popular form of music, and that form will eventually reach a point where everything sounds almost exactly the same (Jenkins, 2017). I believe that this has been building up for a considerably long time, and has reached a head in the past year.

I believe that one thing is going to come to pass soon: pop music is going to start taking risks again, just as it does any time things get too similar. This risk taking could very well take the form of a popular term amongst young music theorists such as myself and Jacob Collier, Negative Harmony. The trend toward more interesting or otherwise unusual chords can be seen in some of the year's biggest alternative albums, such as *Trench* by Twenty-One Pilots or *Delta* by Mumford and Sons, both of which were at number 1 on the alternative album charts. Due to this, I believe this theory is both accessible and reasonable for pop artists to begin using behind their melody lines, as soon as pop realizes that a change needs to be made.

Results

I set out to arrange two pieces of music using the theories posted in the method section. The first is a piece called "A Moment of Clarity", a piano piece which aims to showcase the juxtaposition of the negative chords in the positive key. Written in the key of C, I use a pedal tone throughout the piece to give a constant reminder of the tonic, in spite of the chords which would, on their own, imply a different key entirely. I found while arranging that the chords sounded different depending on the context in which I used them, what came before and after. The chords sound more negative when played quickly, and I feel that is because my ear has less time to process the chord in the context. When the chords are longer, they begin to sound standard and jazzy, unlike what I want. I took steps to combat that, using dynamics and rhythm to offset one's perception of the chords, to throw off the idea that they are simply jazz chords. The perception of the chords is key to effective use of this theory.

The piece itself is essentially the story of someone who wakes up in the morning to a slow beginning. As they go about their day, things get busier and more out of their control. I reflect this in the erratic movement of the chords in the middle section, and the strangely off beat slams in the low end. Then, just as things come to a head, the character finds rest in a moment, breathes, and the titular moment occurs as the chord finally resolves. Whether or not the character continues on to more trying and bombastic times is unseen as the chords hang in the air, but that moment is the most important one to the character.

The second piece, "Lamplight," written for piano and SATB choir, continues my experimentation with Negative Harmony. I deliberately avoided the use of the pedal tone in this one to see if the chords could sound consonant with each other without it, or even related, and I found that the chords worked well together, and it also was not difficult to find decent voice

leading in the choral sections. The chords had a lot of tension to me, created by subverting what an expected chord progression might be, so I decided to play with that throughout. The melody feels troublesome and anxious, much of the reason being the driving eighth notes in the piano. They sit uncomfortably next to the longer melodic line, and even more uncomfortably against the triplets in the melody, like the constant marching of an army going to war.

The eighth notes are only smoothed out in the middle of the piece by the choir coming in with more rhythmic lines. This switch can be felt in the chorus section, when the piano drops out and the voices carry the tune. As per the previous stated definition of brightness and darkness, the chords become brighter. This pattern of brightness and darkness continues until the aleatoric section, starting a new pattern, one of a continual climb toward a much brighter tone.

The piece is titled Lamplight to call up the relationship between this piece and its main focus, that being the analogy of God being a light to the world, a "lamp to my feet and a light to my path" as they say in Psalm 119:105. The piece starts dark, both in word and in harmony and progressively gets brighter as the piece goes on. The aleatoric section, in this sense, is like another "moment of clarity" for this narrator, like a voice coming to them and reminding them that they are "always" with them. The text concludes with a repetition of the phrase "come back to me," but different this time than any time before that it has appeared. This time another voice joins the mix, symbolizing once again the second voice from before, and calls out for the narrator to come back instead. The song finishes without resolving, both in text and in harmony, and I see this as a life that continues on. It has yet to be seen whether the narrator finally goes back to the voice that is calling them.

Conclusion

I would like to end in a similar way that I began; taking cues from Jacob Collier, the most modern primary source there is on the subject. He did an interview in 2017 where he talked about a slew of different concepts, from microtonal voice leading to the human voice, and of course Negative Harmony. His specific viewpoint on the matter speaks to my main point in writing all of this down. He says that Negative Harmony is a way to get new sounds, and that you have to use those sounds in emotional ways, giving him a better pallet in his music making (Lee, 2017). You take the theory and put it in to practice. The many different axes with which this theory can be performed beg to be explored, considering the fact that they could potentially house some interesting conclusions. However, this theory at its core, as Jacob Collier state's about Levy's book, is, "…intended to be composed with" (Lee, 2017). Without the need to say that Negative Harmony is the next 20th century atonal music, one can release their predilections about how this theory should be used and begin to use it whenever it makes the most sense. Keep this theory as a tool, just like all the knowledge brought upon but the study of music theory and continual pursuit of making music, and pull it out when the job calls for it.

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