

Similarities between Prosodic Structures in Language and Rhythmic and Melodic Structures in Music

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Abstract

This paper proposes that music is an artistic representation of language. It is argued that music and language are linked in preverbal communication strategies acquired in infancy. Similarities can be seen between prosodic structures in linguistic communication and the musical binary form. Similarities are also seen in the creation of a sense of narrative in both language and music. It will also be shown that some musicians are instinctively aware of the linguistic nature of the music they make.

1. Introduction

Music is all around us. Its magic seems to touch almost everyone, and those whom it does not touch seem somehow to be the poorer for it. Yet in spite of its universality it seems, at first glance, to be related to nothing in the natural world. Whereas visual art can depict the world we see around us, and literature uses the language of daily life to express ideas beyond our immediate experience, music seems at first glance to be unconnected to our world or our lives. For some music is apparently “an abstract art, *par excellence*” (Kania 2014). However it is proposed here that music is not purely abstract but related in part to natural phenomena. Those natural phenomena are to be found in the prosodic features of language, intonation (pitch changes) and rhythms of speech. It is important to bear in mind that this is not a comparison between all aspects of language and all aspects of music. It is, rather a look at the relations between the two which derive from the rhythms of human communication.

2. Rhythm in Communication

Infants need and desire love, care and sympathy. In the expression of such from their carers, and in their response, infants are involved in a reciprocal system of communication from the very start of their existence, maybe even from before birth (Trevarthen, 2000). From an early age these reciprocations of feelings and empathy between

carer and infant take place in patterns that seem musical in their structures. In research on patterns in communication between a mother and a twelve week old infant, (Malloch, 200), three features were identified that were musical in character, which Malloch collectively called *communicative musicality*. The three features are pulse, quality, and narrative. First, pulse describes the regular succession of discrete behavioural events that occurred over a period of time in the child-mother communication. These events included vocalizations by either party and also gestures and physical movements. The regularity of these events was comparable to pulse, or beat, in music. Secondly, many of the exchanges were imitative in pitch patterns, whether or not the mother's responses to the baby's vocalizations were verbal or non-verbal. These melodic events are called quality, because the changing of pitch contributed to the quality of the expression. Thirdly there was a narrative structure in the way that the energy levels in the exchanges increase and subside in cycles that last around half a minute.

Although the nature of this communication was described as musical, it can also be described as linguistic. First, the pulse, or regular beat, is similar to the way that in ordinary talk, people speak to each other in a regular mere of regular beats, and time their entrances and exits to the rhythms of these beats (Auer, et al 1999). Secondly, the quality of expression means that the infant, even before the acquisition of verbal language, is already actively engaging in emotionally meaningful communication through pitch change. This is the essence of intonation in mature language. And thirdly, narrative structure within communicative musicality seems to correspond to phrasing and narrative structure, both in language and music, to be discussed below.

It appears that the essential elements of music and language arise from the same source at the same time, so that music and language may be considered as two branches from a common origin in human communication. The characteristics of communicative musicality become not only the foundations of linguistic communication, but may also be the archetypes from which evolve the expression of music, and the sympathy to such expression. Communication in infancy, and the musicality of the methods by which it is achieved, are the ways love, care and sympathy are expressed between child and carer. And these behavioural patterns emerging in infancy, existing through childhood, and carried on into adulthood, become some of the ways by which warmth and pleasure is expressed in mature speech. It is hardly surprising then, that when these methods of communication are represented in music, that music then can evoke in us feelings of sympathy, warmth and pleasure.

Another aspect of rhythm in communication can be seen from the point of view of biological rhythms (Chapple 1980). Natural rhythms in humans, range from the smallest cycles of cellular functions, through such well recognized ones as the heartbeat, up to larger circadian and monthly cycles, and longer. Relevant here are *interaction rhythms*, which,

“organize and synthesize all the rhythmic processes going on in the body” (Chapple, 1980: 748). Interaction rhythms, according to Chapple, have certain definable physical characteristics. During interactions the cycle of action and inaction, of tension and relaxation by one interlocutor, is matched with a mirror image by the other, but at 180 degrees out of phase. In other words, when one is active, or tense, the other is passive, or relaxed, and vice versa. This alternation in sequence is a continuing one and where there are no overlaps, stumblings, or interruptions the two interlocutors are said to be in synchrony. Although such interactional rhythms are typically considered to be between individuals, they may also occur between a speaker and audience.

Chapple says that humans require a certain amount of interaction each day, a requirement that varies between individuals, although individuals have their constants for each day. When an individual obtains a sufficient amount of synchrony or complementarity, “the individual will experience that level of activation of the parasympathetic division which leads (using literary terms) to feelings of well-being, affection, love” (ibid: 750). Thus interaction is biologically based, and the exercise of rhythm in communication, fulfills a biological need. It is therefore suggested that one reason why music gives pleasure, and seems to play such a significant part in our lives is that the replications of rhythms of communication resonate in sympathy with our need for interaction. In this way music may fulfill an emotional need.

Similarity can be seen between communicative musicality in infancy and rhythms in children’s songs. The love of regular rhythm and two beat cycles is manifested in children’s songs throughout the world. Because these common features appear in the children’s songs of a large number of different cultures, researchers have concluded that they are clearly not culturally specific but may in fact be musically universal features (Cook: 2000). These features resemble those described earlier in communicative musicality. The first feature, that of the tendency towards the same number of beats per minute may be an expression of the pulse of communicative musicality. The second, the consistency of the number of songs with two or four beat cycles seems to indicate the love of the replication of the to-and-fro of interactive rhythm. The patterns that were acquired in infancy are manifested in the music of childhood.

One well recognized aspect of language play is the happy acceptance by children of nonsense lyrics and nonsense songs. It would seem that the meaning of the words is not the key point of enjoying a song. Rather, it is the underlying rhythms that give pleasure. The words, and perhaps also the melody, are merely vehicles for the rhythms of communication. This way of enjoying vocal music without necessarily understanding the meanings of the words extends into adulthood to the enjoyment we may get from songs in languages we do not understand, or even complete operas whose stories we don’t really understand. In such

cases we are responding more to the musical structures within the song rather than to a literal interpretation of the lyrics.

3. Linguistic Communicative Structures

Growing out of the interactional rhythms of exchange are rhythm patterns that are manifest in both language and music, thus offering physical evidence for similarities between language and music, and evidence to support the proposal that these similarities evolve from a common root. Following are three concepts of linguistic communication upon which will be based comparisons between language and music. They are, 1. the adjacency pair, 2. the intonational adjacency pair, and, 3. isochrony at the point of exchange.

1. Adjacency pairs, “consist of sequences which properly have the following features: (1) two-utterance length, (2) adjacent positioning of component utterances, (3) different speakers producing each utterance... ‘Question-answer,’ ‘greeting-greeting,’ ‘offer-acceptance/refusal’ are instances of pair types,” (Schegloff and Sacks, 1973: 295, 296). However, apart from the cyclic rhythm of one speaker ceding to another, the concept of the adjacency pair deals with the pragmatic rather than the prosodic nature of the language. But its importance here is its relation to a similar pair structure in intonation.

2. The intonational adjacency pair. Bolinger (1986) observed that probably a majority of well-executed utterances have a prosodic shape that corresponds to a question-answer pattern such as, “Do you like them?” “I love them.” And this pattern occurs in longer utterances by one speaker such as, “If you like them, then try them.” Below are the two model examples that illustrate this. The lines below the speeches show the approximate rise and fall of the pitches of the voices. The first example is of a question and answer between two speakers.

“Do you like them?” “I love them.”


The second example is as if spoken by one speaker,

“If you like them, then try them.”


There is a prominence toward the beginning of an utterance and another at or near the end (Bolinger, 1978: 489), thus forming one unit of a pair of pitch peaks. It should be noted, by looking at the shape of the intonation, that this pattern falls in line with the concept

the contrast between open endings, and closed endings of phrases (Cruttenden, 1981:77), whereby, in an utterance, a chain of phrases is held together by high toned endings suggesting continuation until the final falling tone expressing finality (Brazil, et al. 1980:61). In both of these pairs of phrases above, the first half ends on a high held tone, thus expressing continuation into the second half, which comes to rest on a fall. This shape will later be shown to be replicated in music.

In describing this pattern Bolinger says, “There’s a part that lays the groundwork, asks the question, that relates to what we already know or can guess, and a part that adds the figure of the ground, that answers the question, that supplies what was not already known. The first part is called the THEME and the second part the RHEME,” (Bolinger 1986:46). Here one can see a link in semantic characteristics with the previously mentioned adjacency pair. The theme and rheme pair of Bolinger’s structures is equivalent of the ‘Question-answer,’ ‘greeting-greeting,’ ‘offer-acceptance/refusal,’ in adjacency pair structures. The critical difference is that Bolinger’s structure includes an intonational property.

Owing to the similarity between this intonational structure and the adjacency pair, I have called it the ‘intonational adjacency pair’ or IAP. Both the adjacency pair and the IAP occur frequently in language. The adjacency pair is said to be widely operative in conversation (Schegloff and Sacks 1973: 295). Comparably, Bolinger says that the IAP “is encountered so often that it can be hypothesized as a universal tendency” (Bolinger 1978: 489). As both the adjacency pair and the IAP share common features it is almost as if one was a natural expression of the other.

3. Isochrony, the rhythmic division of time into equal portions, is created in English by the regular sequence of stress points in the language. Naturally, this is of interest when we come to compare language with music. A number of researches (Scollon, & Erickson *cited in* Scollon, 1982: 338, Auer et al. 1999) have shown that talk is rhythmically timed to a regular underlying metre or tempo and that in ordinary talk, people speak to each other in a regular metre of beats, and time their entrances and exits to the rhythm of these beats. Thus there is rhythmic co-ordination between speakers at the point of exchange in dialogue. Well-timed turn onsets within conversational sequences are those that establish or prolong a rhythmic pattern across the transition (Auer et al., 1999: 58). “Well-timed,” is an interesting phrase, because it implies not only physical coordination but also an element of positive emotion. This emotion might be a feeling of mutual sympathy between the speakers, which would contribute to the pleasure of conversation. It would seem that our sympathy with an underlying beat in language, and the pleasure of engaging with it is only a step away from our sympathy with an underlying beat in music, and our pleasure in engaging with it.

Combining the IAP with isochrony at the point of exchange creates a structure of two beats followed by two beats, which may be called a pair of pairs. This seems to be related

to the predominance of two or four beat cycles in children's songs, mentioned earlier. It also leads us into a fruitful comparison with musical binary structures.

4. Musical Binary Structures

Having presented some of the intonation patterns that are relevant to comparison with music, the next stage is to see how these patterns are manifest in music. But, before presenting examples of pair structures, it is necessary to understand how the contrast in intonation between open endings, with high or mid termination, and closed endings, with low, falling terminations, is replicated in music. The simplest and clearest example is the extract of Gregorian chant below. It needs no special musical skill to see how the rise and fall of melody, and the timing of the singing are graphically expressed in the musical score.



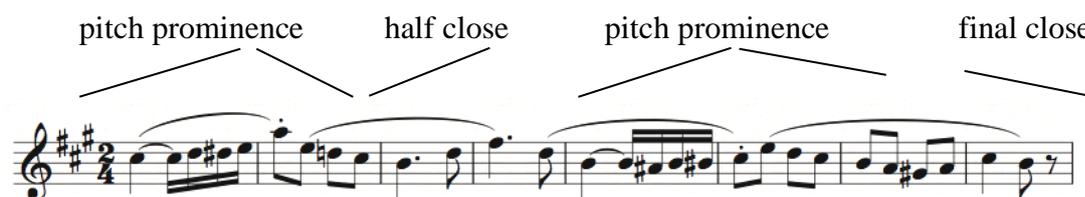
After rising from the first note, the music does not return to that low pitch until the end of the line. In the middle of the line it can be seen there is a half ending at a relatively high point, which keeps a sense of suspension until the final resolution on a low fall. Incidentally, the end of a musical phrase is called the 'cadence,' which is a word derived from Latin meaning to fall. From the shape of the melody written as above it is easy to see in this Gregorian chant how the shape of the melodic line is similar in pitch structure to language. The whole line of music is comparable to a pair of intonational adjacency pairs, even to having prominent (high) pitch changes in each of the four sub-phrases.

It is also comparable to the binary form in music, which is a two-part musical phrase that ends in the middle with a half close, and at the end with a final close. Binary form structures whose melodic shapes are similar to the IAP can be found in many folk and popular songs from the western world, where the melody often reflects the intonation pattern of the lyrics. In addition, many of these lyrics are models of adjacency pair structures. Call-and-response songs, which are typical of work songs, are typically binary structures. These songs are found all over the world. It is well known that the call and response structure of African music, and African American music, is reflected in jazz, and more modern African American music. Similar call and response patterns are heard in work songs from many cultures, including the sea shanties from Great Britain.

However the main hypothesis here is whether identifiable similarities can be shown

to exist in non-vocal music. In other words whether this structure exists not in music as a substructure of the lyrics, but as a structure in its own right. Strictly speaking in discussing instrumental music the model of the adjacency pair cannot be used, as music lacks the idea of bonding through association in verbal meaning. Nevertheless, it may be that the IAP structure finds its way into instrumental music through adjacency pairs found in lyrics.

In order to investigate the comparison between binary form and the IAP in instrumental music, I first carried out an investigation (Eve 2000) to look at the nature of binary form structures and their frequency in the Songs Without Words by Felix Mendelssohn. These are a collection of piano compositions whose melodies are said to represent songs – but without words. Binary forms were usually found in the simple symmetrical binary structures that occur at the beginning of the pieces as the first statement of the ‘song.’ I looked for such melodies that were shaped like the typical IAP structure. In the middle of each phrase there was seen a high melodic point, which is the equivalent of the pitch prominence in the IAP. At the end of the first phrase there is a half close in the music, and the end of the second phrase, a final close. Out of the 48 pieces that make up the complete collection of The Songs Without Words, 25 were recognized as having opening sections in binary form whose melodic structures clearly resemble the IAP. Such a weight of evidence seems to indicate a correlation that is more than coincidental between the prosodic structures of adjacently paired exchange structures in language and the melodic and rhythmic structures of simple binary form in music. The first eight bars of Song No. 30 (Opus 62, No. 6.) are a good example.



The pitch prominent points can be seen in the first and second halves, The first half can be seen to end on a rising termination, like a question waiting to be answered, and the second half ends with a fall, fulfilling the response. Thus does music imitate the shape of spoken language.

5. Narrative Structures

The third characteristic of communicative musicality discussed at the beginning is a sense of narrative structure in the patterns of discourse communication between infant and carer. In the following section comparisons will be made between narrative structures in language and music.

A story has a beginning and an end. The beginning sets the scene. For a story to have a purpose there is a problem to be solved. And that problem is solved at the end. This is the three-part structure of a typical narrative (Bruner, 1996: 121, Propp, 1968). For this discussion the three parts are called, stability-violation-resolution. Music creates a sense of flow, a sense of going somewhere, by drawing the listener on with tensions that await resolution. Because the patterns of tensions and resolutions created in music are comparable to such patterns in language, the term narrative is used to describe this sense of flow within music.

There is a school of thought that compares long narrative structures in music with plot structures in literary narrative (Karl, 1997, Maus, 1991, Micznik, 2001). Correspondence is seen (Maus, 1991) between descriptions of structure in music theory, such as in Schenker's writings, and descriptions of structure in literary theory, such as in Tzvetan Todorov. He brings together musical structure and story structure to argue for a similarity of structures in eighteenth and nineteenth century music and the plots of stories. Considering that at this historical period in western culture, long musical works seemed to develop at the same time as long literary works, it would seem reasonable to think that there was some similarity in the mental processing of long structures in music and long narratives in literature. However, one may question whether listeners really appreciate music as having a sense of an overall plot, and whether listeners can really sense, at the end of a long piece of music, the resolution of a tension that was created at the outset, as happens in literary narratives. It seems more likely that the sense of narrative in music relies on more adjacent cycles of tension and resolution. Another reason to question the notion of an overall plot structure in music is because most everyday speech is not constructed of completed plot narratives. In most natural speech, a sense of narrative is sensed whilst the language emerges. Small narrative cycles create an ongoing sense of narrative in the ever emergent language. Thus it seems reasonable to look for similar features in music.

There is one caveat in the comparisons to be made. Narrative may be created in music from elements that have little equivalence in language. Musical tonality and harmony, for example, are systems of tension and resolution that cannot be directly compared to language or claimed to be replications of language. Repetition is an important element of musical narrative. There is a play between the familiar and the unfamiliar, where the tension from hearing something strange and unfamiliar is resolved by a return to the familiar. In this way repetition is used far more in music than in language to create narrative. Nevertheless, in spite of these differences, it can be shown that there are musical narrative structures whose overall designs are similar to linguistic narrative structures. This will be illustrated here with three narrative structures.

1. A – B – A. The simplest story narrative structure is one based on the simple

stability – violation – resolution structure. This exists as the A – B – A form in music, where each letter represents a substantial section of music. One example of this form is the ternary aria form from the Baroque period of western music (around the early eighteenth century). In this form the A and B sections of music are different, but the final A is a repeat of the first. In this way the repeat of the familiar section resolves the tension felt from the introduction of the unknown B element. The A – B – A form is also the typical structure of jazz performances, especially of the first half of the twentieth century. Jazz pieces are typically based over the multiple repeats of songs. The first time the tune is played, or sung, it is more or less as the composer wrote it. Then follow the improvised variations of the tune, typically with each instrumentalist playing their own improvised versions of the tune. These are melodic variations over recycles of the fundamental harmonic structure of the tune. These repeats of the song constitute violation of the original stability. At the end stability is re-affirmed when the tune is restated in its original form. This might be described as, A – B₁ – B₂ – B₃, etc., – A.

2. An extension of this form is the A – B – A – C – A – D – A structure. This is similar to the literary structure in which one long narrative contains many small narrative structures within it. Typically examples are the journey stories such as the Odyssey, Lord of the Rings, etc., where there is usually a traveler or a group of travelers who encounter various adventures on their quest to achieve their ultimate goal. Each adventure usually ends with a return to the normal group continuing on their journey. This could be described as an A – B – A – C – A – D – A structure, which can be extended as much as one likes. This is the same as the song form of Verse 1, Chorus, Verse 2, Chorus, Verse 3, Chorus, etc. The Rondo form in western classical music is basically similar to the verse and chorus form, but is usually instrumental. Whereas the song form shows variation in the lyrics, the rondo shows variation in melodic, rhythmic, and tonal structures.

3. A – A – B – B – C – C, etc. The last narrative structure to be put forward here is one that is built on a series of simple binary structures. These create cycles of narrative within a musical composition, often of a formally larger structure. The first binary pair is constructed of a half close and a full close. Compatibility between the two halves is usually shown by thematic similarity. Consider that in a linguistic adjacency pair compatibility is shown in verbal relationships. However, in music it is often thematic repetition that creates this compatibility between the two halves. In this way the A + A pair becomes become a familiar pattern, a stability reinforced by repetition. Against this the introduction of the new theme B becomes a violation of this stability. Then there is a repetition of the B theme, which again is usually in the form of a binary pair. Thematic repetition increases familiarity with the new idea, thus the tension caused by the unknown resolves into the stability of the known. The violation is transformed into its own resolution. The music has gone from stability to violation to resolution at a new level of stability. The next new idea then becomes a violation of this

new stability, etc. This pattern can be recycled on and on in a similar manner. Schematically, the above would look like this:

A (stability), A (reinforcement of stability),
B (violation), B (repetition which creates a new stability by reinforcement),
C (New violation), C (new stability), etc.

The cycles of tension and resolution that are created by chains of binary forms in this way can create longer musical structures.

As was said above, finality in a long piece of music is not usually expressed by the resolution of a long-standing still unresolved tension expressed earlier in the piece, as it might be in a literary narrative, for example a murder story. A return to stability is often expressed by a repeat of the opening material. In this way the tension of the unknown is resolved in the stability of the familiarity of the known. In addition, finality in music is often expressed by conventional terminating structures, which include rhythmic, melodic and harmonic patterns. Again the sense of resolution is created by the expression of familiar features.

Therefore, although language and music use different ways to express internal cycles of narrative within a long narrative structure, and although music and language may use different ways to express the final termination of a long narrative structure, both create numerous cycles of tension and resolution, or partial resolution, within a longer structure, and both media, in their own ways, express a sense of final resolution. The fact that we can sense a similar rhythm in the expression of these patterns of tension and resolution in both media shows that literary and musical narrative are qualitatively comparable at a fundamental human level.

6. A Sense of Language

One of the premises of this paper is that most people are unconscious of the nature of the exchange structures that shape their natural language communication. It is also probably true that, beyond song lyrics, people would not immediately associate the music they listen to or play as having any kind of structural relationship with language. However there is one area of musicianship where a more conscious and direct comparison is made between language and music, and that is jazz improvisation. In her book, *Saying Something: Jazz and Improvisation*, Ingrid Monson (1996), explores the “collaborative and communicative quality of improvisation,” allowing the musicians, through interview, to express their own feelings and opinions. In so doing, they regularly use metaphors of conversation and storytelling to describe the vibrant and ever creative music making that

underpins jazz improvisation. She noted that when musicians refer to playing music as “talking,” they emphasize communication through the act of performing music. And when they compare performance in the ensemble to “conversation,” they refer to a specific genre of musical talk that requires listening carefully to the other participants (ibid. 85). It shows that the musicians, although they may not be clearly aware of the structures of rhythm in communication that they replicate in their music, instinctively have an idea that music has something in common with language. These jazz musicians, who are actively creating music by improvisation, are probably more aware of the rhythms of communication that underlie music than other musicians whose performances consist in interpretation of a written score.

Conclusion

A conventional definition of language may be one based on word meaning. It may therefore seem a bit extraordinary that this critical aspect of language is overlooked in the above discussion. This is because it is argued that music and language share their roots in the prosodic features of proto-conversation that develop during infancy. And it is the characteristics of nonverbal, or non-symbolic, communication, expressed typically through prosody, which play an important part in the expression of feelings and emotion in speech. Compared to our conscious use of verbal language in expressing thought, for the most part, we operate the prosodic system unconsciously. This means that although the replication, or representation of intonation structures in music can evoke feelings and emotions as they do in language, we are usually unaware of this. This paper has been written to bring this to light.

Space unfortunately limits providing a fuller discussion to support the proposals made here. Readers are welcome to turn to my longer paper, available online, which provides a further and deeper discussion.

Many issues, yet to be explored, may support or perhaps refute the hypothesis made here in this paper. Never the less, I believe that the evidence presented above should be sufficient to support the proposition that music is an artistic representation of language.

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