Markos Lekkas

Optical and Acoustical Gestalt, Illusioning the Brain

Beating the ear drums

The human ear differs from other sensory instruments in that it has no detectable turning off mechanism as it happens e.g. with the eyes, which can be turned off and therefore by default receive only a partial amount of the existent visual information. Since there does not exist such an auditory mechanism, every time a sound enters the ear canal, reaches the eardrum automatically, causing it to react, obliging the ear to acknowledge the entry, by way of the reactionary movement of the drum.

In that sense, everything within reach of the ear is under surveillance.

The ear although lacking such a mechanism, as empirical observation shows it is able to hold and send to the brain only a small portion of the information it receives, raising concerns about the solidity of is function inside its 'always awake' condition.

It is thus possible that the ear passes the major part of its life with the communication to the brain turned off except for the mere reporting of the existence of sounds, without sending a complete description of them, resulting in a diffused, incomplete and scattered understanding of what these sounds really are on the part of the brain.

This is supported by the fact that language has invented two verbs describing the receiving process, *hear* which means that the brain becomes aware that a sound hit the eardrum and *listen,* which means that a sound hit the eardrum and the brain except becoming aware of the fact, would also get a description of the event.

In the second case the brain, tracking the movement of the eardrum, would be able to explain what was heard and in the first could merely testify that sounds existed.

This could be equivalent to the curtain moving, responding to the breeze.

An observer would be able to deduce the characteristics of the wind by tracking its effect on the curtain, in the same manner that the mind could deduce the properties of the sound by observing the movement of the eardrum. But if this movement is either not recorded or not understood then the properties of the sound that caused it, are also being lost.

This phenomenon could very often occur in the concert hall, where by default the music exists in the same room where the ears are situated. The music travelling through the ear, beats the eardrum continuously, but unless the seismograph of the brain tracks the course of its impact, the brain would not be aware of what it sounded like. It is then possible that although the audience is being there with the sole purpose of listening, to drift away its attention resulting in the reduction of *listening* to mere *hearing* with minimal neuron involvement and scattered travelling process towards the brain. The result would be that everybody could be able to testify that music was played, without everybody being in a condition to describe what, limiting thus the description to generalities, which are not a direct outcome of the actual 'being there' and could at times match the description one who did not attend the concert would give.

In this case if the information about the specifics of either the curtain or the eardrum movement would not be tracked by the brain, then the entire course of events is meaningwise insignificant and important only in its remnant, archeological sense.

Meanwhile, language would introduce a new, superfluous nevertheless necessary, signifier in its semiotics, 'attentive listening' even though by definition listening can only be attentive. Language therefore does not attempt to define ways of listening, it is the condition of the mind it tries to come to terms with.

Observing the process of ignoring

It is possible that when sound enters the auditory vicinity, the ear has no direct involvement in the administrative process of information, as itself is no more than a wind vane, the movement of which is the actual information. In this respect it might not even get a command from the brain, being thus just a shore, which following its eternal destiny keeps receiving sound waves in absentia, having no actual sense of receiving them nor any awareness of its own being.

In the same manner in the visual domain the retina of the eye, equally unsuspicious of its own existence, might reflectively change its shape giving signals to 'whom it might concern'. In case it is being tracked by the brain, which – having no eyes and no ears of its own – having thus never seen or heard anything in its entire existence, having therefore no idea if anything really exists beyond the neurons, the information is processed and stored in the warehouse of memory where it lives thereafter as 'experience'.

Thus while the eye without losing its course, could follow diligently its assigned route, the mind could lose sense of a page in a book, transferring its focus into another instrument [such as the ear] or just using its engine power to adjust and defragment pieces of information from another faculty or simply being sunk into heavy traffic confusion.

As a result, data vacuums are interspersed and interlaced with vital information confusing additionally the narrative, which the mind does not know how to handle in its attempt to decode the sequence of the auditory events, which as a result are being lost forever.

The process of the deception

What is peculiar in the relation of the brain to the sounds is the fact that is capable of recognizing a melody from another and keep it in memory easier than it is to distinguish and remember the difference between one pitch and another, at times not even being aware of which exactly direction the notes go.

This is a unique mode of operation in which the brain can adapt and function better in front of a pattern of elements than it is in front of the elements themselves, separately, understanding in that sense space and arrangement instead of individual elements.

Its ability to distinguish a series of pitches than a single one in itself, seems to be one of its most fundamental characteristics, leading to the conclusion that it is not the notes per se, which are tracked but the intervals between them.

In this respect it is rather curious that while having a certain limitation in absorbing specific detail, at the same time the brain has the ability to combine several elements, even different from one another, comprising a larger whole.

In the next example there are three lines which when combined into one pattern seem to be easier understood and recognized than when they are separate.

Example 1a. Single elements and pattern formation

Curiously, the brain seems to either have a better grasp of complete shapes with unique patterns or that encounters difficulty of understanding multiple shapes at once, even similar ones.

In the next example, the individual bars are different from each other containing detail that would require more complicated observation especially when combined into one, as the shapes in this arrangement are more intricate.

Example 1b. Single elements and pattern formation

Although one would expect the brain to require an additional effort due to the intricacy of the shapes, it seems that it does not particularly care to distinguish between them, instead, identifies the simplest possible generic outline being closer to a pattern in its own database, checking only the approximation to its stored patterns, either classifying or rejecting them on the premise of the resemblance. As a result, the perception of this shape would be identical to the previous one, as the brain captures easier the combined shape than the three individual ones seeing a single letter, as it did before, its route being the easiest possible way.

Although one could get the impression of a more complicated procedure involved, in reality the outcome denotes again a rather overly simplified formation where the individual parts are not examined but are used as mere constituents in order to form a single rather simple object, the simplicity of which renders it easy to memorize.

Example 1c. Single elements and pattern formation

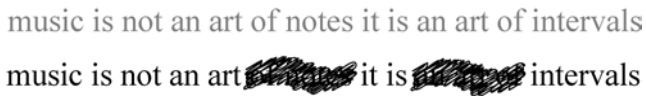
Thus the brain apparatus seems to contain a database of patterns, against which the signals perceived are tried in order to detect if they match. If they do, based on degree of similarity they are accepted and classified, if they do not, the brain gets confused and rejects them.

The following example consists of a complete sentence, i.e. a complete whole.

music is not an art of notes it is an art of intervals

Example 2a. The complete whole

If however the brain is busy performing another task, or encounters sensory difficulty during perception, it is possible that only certain familiar portions would be processed such as this.

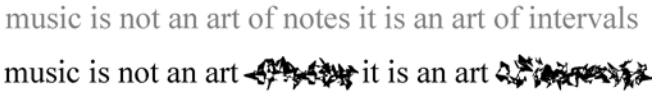


Example 2b. Partial whole

The brain relying on the incoming information receives three different 'partial wholes' being unaware about their nature, having no way to know what the complete whole is. Thus it can either form three different meanings or mend the parts into one [following the gestalt Principle of Continuity]. Since the middle part of the three contains no meaning in itself it would have to be rejected as irrelevant or be jointed with the other two producing a complete, albeit misleading narrative, which is impossible to be checked against the original.

The mind does not have a way of distinguishing between different wholes in terms of meaning or importance, it searches therefore for any whole, processing naturally the most familiar, the ones it is able to recognize first, its law and truth being the 'first impression'.

In the next example the mind would have to come to terms with and extract the intended meaning following an almost random procedure of stored gestalt combinations.



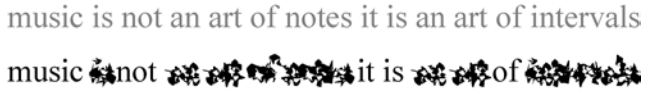
Example 2c. Partial whole

Although all its sections match patterns from the database, there exist at least two different meanings, making the connection impossible, no matter how it is rendered, with final outcome that the meaning would not be discernible.

This is one case where the brain has a complete narrative whole, but has no idea on how to deal with it as it stumbles on the idiomatic simultaneous occurrence of a complete narrative with no corresponding complete meaning.

This is one of the most frequently occurring instances in musical performance where the player does not understand the narrative but nevertheless executes the structural part, playing just the pitches on time, explaining the procedure as *interpretation*.

The next example is just another haphazard intake of information, which will not be understood no matter how it is rendered.



Example 2d. Partial whole

The brain being familiar with order of events would search its database finding only partials on the level of structure [words], obliged to use its idiosyncratic quality of either ignoring the incoming information by drifting away, creating the phenomenon that although the ears are situated in the same room with the music

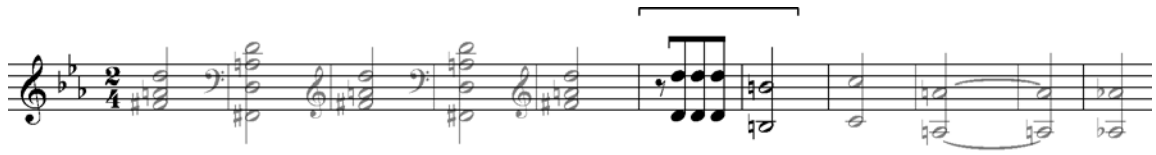
and the eardrums are being constantly hit but the signals, lose the linear connection to each other, getting dispersed on the way to the brain.[1]

As the processed information represents a small only portion of the whole, the mind is obliged to focus by default on one particular area of a longer pattern of sounds, becoming thus conditioned and more capable in the process of ignoring than in the process of focusing.

In this respect the brain loses access to a large portion of the existent information, without knowing, neither the meaning of what these 'partial wholes' are nor what they represent in relation to the 'complete whole' that exists outside the ears.

However at the end it is still left with several pieces of information, bound with the task to process, whether they are related or not.

Thus the brain [in conjunction with the sensory instruments] works also – or mainly – with partial wholes, without being aware that are only partial, thinking perhaps that these are the 'entire whole' and are related to one another in a sequence of appearance, according to the order it receives them. It is then possible in the next example the brain would only detect the central pattern [motive] putting out of focus the rest.



Example 3. The motive as summational signifier of the whole [Beethoven Symphony No. 5, i]

In this manner the brain discriminates towards the received data dividing the information into two categories, one which is able to follow, creating thus a partial whole and another which cannot follow and abandons without being able to trace and identify as part of the piece.

Thus the piece exists actually mostly out of focus being contracted into an abstract summary, the entire movement having been codified into the motive, which acts both as signifier and signified. In this manner the motive is not simply a point of reference to the piece but the piece itself, compacted into a non-expandable nucleus, turning the rest of the piece into hazy background.

The internal politics of the Brain

Since the brain has no ears and eyes of its own, its capability to make correct judgements depends solely on the information it receives and the tracking tools at its disposal.

The ear cannot communicate a sound to the brain because the brain does not know what a sound is, the ear therefore can only describe the impact of the sound on itself, from which the brain would attempt to detect the cause. This involves necessarily an interpretation of the signals or more precisely a diagnosis of the symbolic signs received.

In this way one is bound to enter the semiotics of the brain.

The semiotics of the brain involve interpretation of the symbols, hence attempting a reading of a signifier, a reading of what 'seems to be' and in this way one is bound to enter the phenomenology of the brain.

Inside an ingorant mind

It is often said that a melody is comprised of certain pitches, but in reality its reproduction is based in the juxtaposition of intervals existing between these pitches, as Edwin Evans acurately described its «*music is not an art of notes but an art of intervals*».[2]

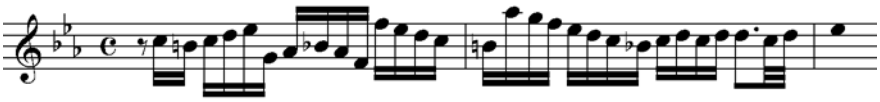
The human brain seems to be capable of distinguishing the rhythmic elements easier hence the invention and functional use of the Morse code, which is based on an organization of sounds into time patterns. It seems therefore that the sounds enter the cognitive part of the brain not as individual entities but as already formalized constellations, remaining in the mnemonic part of the brain in the same fashion.

1 A similar occurence in music is the 12-tone system which has posed a grave difficulty to the audience to follow the element which is most familiar with, the horizontal line.

2 Evans, Edwin: Grove Dictionary, 1954.

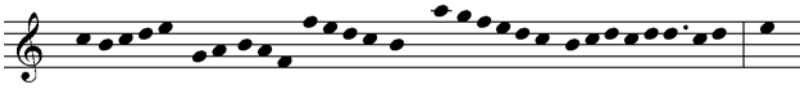
There, the patterns are compared against its memory database of familiar patterns,[3] which are characteristic for their simplicity of organization following the gestalt principles of similarity and proximity.

In the next example the notes except for the rhythmical organization form also patterns based on pitch exclusively.



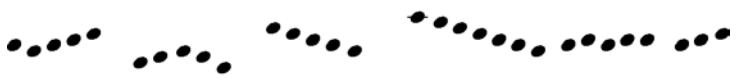
Example 4a. Bach. Invention No. 2 BWV 773

Following these patterns it is obvious that do not coincide with the rhythmic structure, as their sequential path differs from the motivic structure.



Example 4b. Bach. Invention No. 2 BWV 773

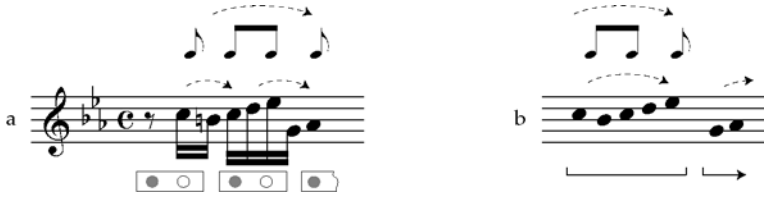
Looking at the shape of these patterns it is obvious that they form independent constellations of pitches, which are detectible both by the eye on paper and by the ear in terms of their position in the tonic spectrum.



Example 4c. Bach. Invention No. 2 BWV 773

However pitch itself is not yet organized music and it needs to be placed within the structural mould, forming cells, motives and phrases in order to obtain its syntactical identity.

Unfortunately very often the brain of the performer is fooled by the pattern recognition of tonic elements, with result the performance to follow their proximity of pitches ignoring the syntactical structure, providing a false interpretation of the music by playing groups of notes that happen to lie close to one another.

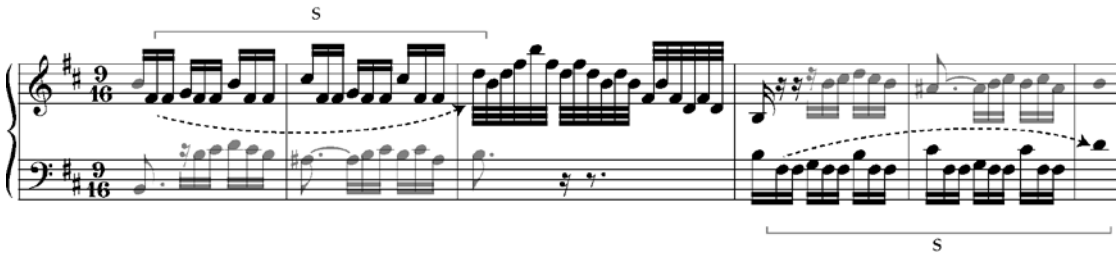


Example 4d. Bach. Invention No. 2 BWV 773

Thus instead of the measure being divided correctly, arriving at the strong part of the pulse [a], it is often bypassed ending on the arsis – on E instead of A – forced to start the next cell in the wrong place [b], giving a haphazard performance in which the brain takes part with its mnemonic faculty only, without engaging the critical part of it, failing to render a meaningful performance of what is written on paper. The result is yet another incorrect execution setting the foundations for more dubious interpretation, as it feeds the brain with false information of what to look for and what to expect.

In the same manner in the next example the visual representation of the notated pitches has lead most performers to ignore the syntactical structure arriving again in false execution.

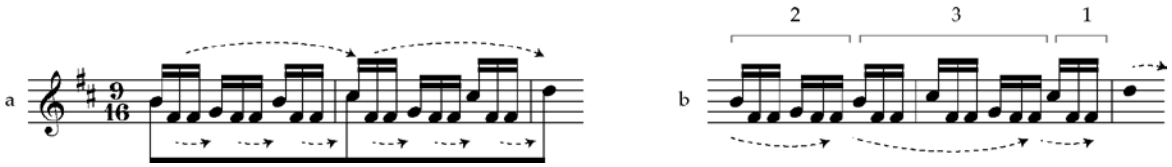
[3] Familiar in the sense that they are known to the brain, being already in the database and therefore recognizable.



Example 5a. Bach. Sinfonia No. 15 BWV 801

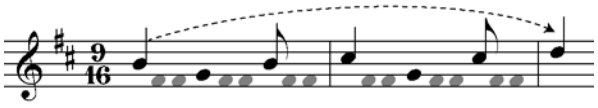
As a result – although they are identical – the first two measures are played differently than measures 4 and 5, interpreting the visual depiction instead of the syntactical organization. Thus the first notes of meas. 1 and 4 are perceived as having different roles each time, shifting thus the pattern by a sixteenth value.

In the same manner the subject in the first two measures is performed either in groups of two or two, three and one as shown below, ignoring thus both the measure and the motivic drive towards the beginning of the third measure.[4]



Example 5b. Bach. Sinfonia No. 15 BWV 801

In this way the voice leading towards the D is also misinterpreted, giving preference to the irrelevant F sharp [b] while the built – in rhythmic pattern [a] is ignored as well, braking the voice leading of the upper part, shown below.



Example 5c. Bach. Sinfonia No. 15 BWV 801

The final outcome is the alteration of the identity of the subject itself, caused as a result of the lingual artifacts produced during the transfer of the visual information from the paper, back to sound, a byproduct of an art whose language has not yet found an adequate way of reading its own syntax.

Epiloge

Since the institution of mensural notation, the language of music has focused its system of representation perhaps too literaly, on the temporal distance of the aural events, making it easier to detect the non-structural barline than the structural boundaries of the cell and the motive, leading consequently to the invention of a grammatical manual of operation, taking care that all events are spaced properly, leaving thus no room for a parallel syntactical tool to deal with the perception of its meaning.

Music therefore in its visual representation is mostly being expressed as a serial placement of temporal events, lacking the necessary notational means to express the cognitive structure of its organization, becoming hence a visual map of signs occuring in space, attempting a metaphorical representation of aural events occuring in time.

Within this framework, while the brain is involved in simultaneous parallel translation between running temporal and static visual symbols, transforming the one into the other indiscriminately, the process of turning one gestalt summary into another, determined most of the time by chance, is largely considered a matter of aesthetics…

[4] An exception among about 20 recordings is the one by Vlandine Verlet (1997).

Bibliography

Parry, Joseph D. *Art and Phenomenology* (Routledge, 2011)
Rowell, Lewis Eugene. *Thinking about Music* (U of Massachusetts Press, 1984)
Hauser, Arnold. *The Social History of Art* (Routledge, 1999)
Rings, Steven. *Tonality and Transformation* (Oxford UP, 2011)
Snyder, Robert *Music and Memory* (MIT Press 2001)
Ando, Yoichi; Cariani, Peter. *Auditory and Visual Sensations* (Springer, 2009)
Berry, Wallace. *Structural Functions in Music* (Dover, 1987)
Ehrenfels von, Christian. *On Gestalt Qualities* (1890)
Jankélévitch, Vladimir. *Music and the Ineffable* (Princeton, 2003)
Koffka, Kurt. *Principles of Gestalt Psychology* (Harcourt, 1935)
Krumhansl, Carol L. *Cognitive Foundations of Musical Pitch* (Oxford UP, 2001)
Merleau-Ponty, Maurice *Phenomenology of Perception* (Routledge, 1945)
Wertheimer, Max. *Gestalt Theory* (Hayes Barton Press, 1990)
Zizek, Slavoj *The Parallax View* (MIT, 2009)

Santrauka

Optinis ir akustinis geštaltas, proto iliuzijos procesas

Nuo tada, kai buvo sukurta menzūrinė notacija, muzikos kalba gal ir kiek per daug skrupulingai grindė savo sistemą garsų ilgio santykiais, tad nustatyti takto brūkšnio, kuris nėra struktūriškai svarbus, vietą tapo lengviau nei nustatyti struktūriškai reikšmingą motyvo pabaigą. Todėl reikėjo surasti gramatines priemones visus muzikinės kalbos elementus išdėstyti laike taip, kad jokios naudojamos sintaksinės priemonės negalėtų daryti įtakos muzikos prasmės suvokimui.

Taigi vizualiai muzika dažniausiai perteikiama kaip nuosekli įvykių laike seka, kurios struktūrinei sandarai išreikšti trūksta reikalingų notacinių priemonių, todėl ji tampa ženklų, išdėstytų erdvėje, vizualiniu žemėlapiu, mėginančiu metaforiškai pavaizduoti garsinius įvykius, išdėstytus laike.

Tuo tarpu žmogaus smegenys dėl savo idiomatinių suvokimo principų notacinius vaizdinius, užrašytus popieriuje, formuoja pagal geštalto principus, transformuodamos juos į geštaltines garsines figūras, kurias smegenys suvokia skirtingai. Kadangi smegenys iš karto gretina laiko simbolius, kurie juda laike, su nekintamais vizualiniais simboliais ir vienus paverčia kitais, vieno geštaltinio rezultato virtimo kitu procesas, dažniausiai nulemtas atsitiktinai, paprastai priskiriamas estetinio požiūrio klausimui.