— vordenker-archive —

Rudolf Kaehr

(1942-2016)

Title

Morphogrammatics of Memristive Music Production

Bisymmetry and palindromy as subversive interactions of composition

Archive-Number / Categories

3_29 / K09, K08, K11

Publication Date

2013

Keywords / Topics

MORPHIC AMBIENT MUSIC : Towards iterability without ghosts, Time and repetition, nvention and surprise beyond predictability and decidability, Anti-palindromes of repetition, Bisymmetry as a mechanism of cognitive perception of palindromes, Ambient sounds based on spatial morphograms, Education and training for anti-palindromes

MATHEMATICAL THEORY : Loops as Palindromes, Mixtures as palindromic fields, Balanced, under- and over-balanced palindromic fields

TECHNICAL SOLUTIONS : Memristive devices

WHAT'S ON THE HORIZON? : DNA music - the iteration of the same,

Disciplines

Artificial Intelligence and Robotics – Cybernetics – Semiotics – Epistemology – Theory of Science - Other Languages, Societies, and Cultures

Abstract

Auditive iterability: beyond repetition, iteration, recursion, reflection and other loops.

From phenomenological analysis of musical events to grammatological and morphoanalytical deconstructions of sonic events.

Citation Information / How to cite

Rudolf Kaehr: "Morphogrammatics of Memristive Music Production", www.vordenker.de (Sommer Edition, 2017)
J. Paul (Ed.), http://www.vordenker.de/rk/rk_Morphogrammatics-of-Memristive-Music-Compositions_2013.pdf

Categories of the RK-Archive

Morphogrammatics of Memristive Music Production

Bisymmetry and palindromy as subversive interactions of composition

Rudolf Kaehr Dr. phil

ThinkArt Lab Glasgow ISSN 2041-4358

Abstract

Auditive iterability: beyond repetition, iteration, recursion, reflection and other loops. From phenomenological analysis of musical events to grammatological and morpho-analytical deconstructions of sonic events.
(*Work in progress vers. 0.4.5, Sept. 2013)*

1. Morphic ambient music

1.1. Towards iterability without ghosts

1.1.1. How to resist palindromes?

> *"In language there are only differences. Even more important: a difference generally implies positive terms between which the difference is set up; but in language there are only differences without positive terms."* F. de Saussure

What's about palindromes?
Can we still afford to restrict our life to the semiosphere and its palindromes? Palindromes are ubiquitous. But this kind of ubiquity is limited by its semiospheric deep-structure.

What happens to our understanding of repetition, time and identity, and its consequences to loop-oriented aesthetic productions, if not just *Anna* is a palindrome but *Annabelle* too?

How could this be possible?

We are used to read a word like "Anna" as a linear sequence of letters: "A", "n", "n", "a". With the start letter "A" and the last letter "a". The successive reading of the sequence of the letters "A", "n", "n", "a" from the start to the end is recognized as the word resulting in "Anna".

This, obviously, is highly trivial. We had have well 3000 years time to train it. And our children are still forced to learn this approach as the only way to read and understand the world.

On the base of this training, it is impossible to recognize the word "*Annabelle*" as a palindrome. It's forward and backward reading isn't the

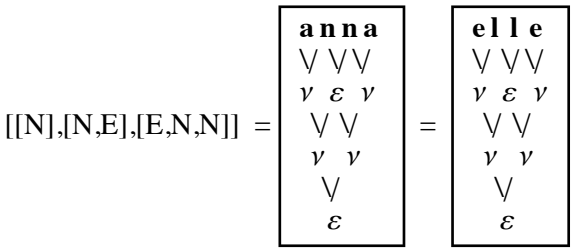
same. For the word and name “Anna” it is the same, at least phonetically: <Anna> = <annA>.

But there is no need to be mesmerized by the singular entities represented by the atomic letters “a” and “n”.

It becomes quickly evident that another word like “elle” has a similarity to “anna”. Albeit all the necessary entities, i.e. the letters, are different, it is still a linearly ordered sequence of the same structure.

And if we are finally annoyed enough by such enforced readings of the entities we will be happy to focus, not on the entities as such, but, at least, on the *differences* between those entities.

Hence, from this level of cognition the words “*anna*” and “*elle*” are just the same. They are ‘pheno-typical’ realizations of the same ‘geno-type’ of differences:



The word “anna” is, as we know, a palindrome: rev("anna") = "anna". Palindromes of this kind, i.e. focused on entities (letters, sounds, movements, etc.) are symmetric.

This kind of symmetry is preserved with the difference-theoretic understanding of the palindrome ”anna”. But to get this nice result we have to “flatten” the differential order.

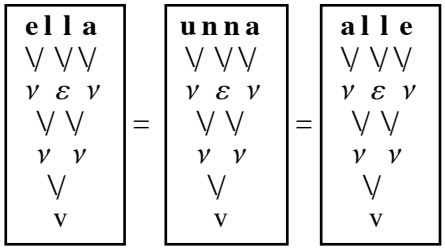
flat[[N],[N,E],[E,N,N]] = flat[[N,N,E],[E,N],[N]] = [N,N,E,E,N,N], then the reversion is stable:

rev([N,N,E,E,N,N]) = [N,N,E,E,N,N].

Geno-/pheno-types: Annabelle’ s playground in Ullapool

> "The genotypical ‘word’ “*annabelle*” is composed from pheno-type words “*anna*”, “*b*” and “*elle*”, which are symmetric. But the composition of the parts to the word “*annabelle*” delivers an asymmetric palindrome. This asymmetric word “*annabelle*” is a palindrome on the genotype level of morphogrammatics but not a palindrome on the phenotype level of linguistics and semiotics.
>
> "This leads to the insight that the relationality between geno- and phenotypes is not hierarchical but is involved in the interplay of a heterarchic chiasms. This aspect of a chiastic interplay is not well recognized in classical theories where the relationship between geno- and phenotypes is generally thougth as a stable hierarchy.”
>
> http://memristors.memristics.com/Morphospheres/Asymmetric%20Palindromes.pdf

Linguistically, the words, “*ella*” , “*unna*” and “*alle*” are different asymmetric words and at the same time of cognitive perception they are morphogrammatically symmetric and the same. Hence, [ella] = [alle] = [unna] = [annu] = [ulla] = [pool] ∈ Sym.

[[N],[N,E],[N,N,N]] = 

Now, after this little deconstruction of the modi of perception, this shift on focus opens up to 'read' the word "*Annabelle*" as a palindrome too.

Don't get blinded by those entities, like letters, sounds, tunes and note, perceive, cognitively, the *differences* of the arbitrary occurrences in "Annabelle".

Lets *calculate* it:

The word "*Annabelle*" gets a numeric representation as the sequence: [1,2,2,1,3,4,5,5,4].

As we are bored to be lost in 'entities' (letters or numerals) we concentrate, cognitively, on the not perceivable differences of the sonic 'event' "*Annabelle*".

This calculates as the EN-structure of the number sequence [1,2,2,1,3,4,5,5,4] with E=equal and N=not-equal.

```
- ENstructureEN [1,2,2,1,3,4,5,5,4];
val it =
  [[],[N],[N,E],[E,N,N],[N,N,N,N],[N,N,N,N,N],[N,N,N,N,N,N],[N,N,N,N,N,N,E],
   [N,N,N,N,N,E,N,N]] : EN list list
```

Or depicted as an e/v-matrix:

v	–	–	–	–	–	–
v	***e***	–	–	–	–	–
e	*v*	*v*	–	–	–	–
v	*v*	*v*	*v*	–	–	–
v	*v*	*v*	*v*	*v*	–	–
v	*v*	*v*	*v*	*v*	***e***	–
v	*v*	*v*	*v*	***e***	*v*	*v*

A propos, the bilateral symmetry of this e/v-matrix is directly accessible and defines the structure as a palindrome.

What we easily can detect: The difference structure, the so called *ε*/*v*-structure, of the sequence [1,2,2,1,3,4,5,5,4] is exactly the same as the *ε*/*v*-structure of its reversion: [4,5,5,4,3,1,2,2,1].

That is:
ENstructureEN[1,2,2,1,3,4,5,5,4] = ENstructureEN(rev [1,2,2,1,3,4,5,5,4]).

With that we avoid, at first, the use of the methods of *bisymmetry* to determine the palindromicity of the *ε*/*v*-structure of [1,2,2,1,3,4,5,5,4].

Taking "annabelle" back into the game, we just have shown the identity of "annabelle" = "ellebanna".

Quite obviously, "annabelle" is not symmetric to "ellebanna" but asymmetric. And therefore, the statement to call it a palindrome is 'utter nonsense'. By definition, there are simply no asymmeric palindromes.

> "The genotypical 'word' "*annabelle*" is composed from pheno-type words "*anna*", "*b*" and "*elle*", which are symmetric. But the composition of the parts to the word "*annabelle*" delivers an asymmetric palindrome. This asymmetric word "*annabelle*" is a palindrome on the genotype level of morphogrammatics but not a palindrome on the phenotype level of linguistics and semiotics.
>
> "This leads to the insight that the relationality between geno- and pheno-types is not hierarchical but is involved in the interplay of a heterarchic chiasms. This aspect of a chiastic interplay is not well recognized in classical theories where the relationship between geno- and phenotypes is generally thougth as a stable hierarchy."
>
> http://memristors.memristics.com/Morphospheres/Asymmetric%20Palindromes.pdf

Certainly, there is no chance to escape such a judgement if we have to talk to entity-driven minds.

A loop pool in Ullapool

"Ullapool (Ulapul) has a strong reputation as a centre for music, the arts and performance."
Loopallu Music Festival

Morphic analysis of Ullapool.

num(Ulla) = (1,2,2,3),
num(Pool) = (1,2,2,3),
- ENstructureEN[1,2,2,3];
val it = [[],[N],[N,E],[N,N,N]] : EN list list

v	–	–
v	***e***	–
v	*v*	*v*

num(Ullapool) = (1,2,2,3,4,5,5,2),
- ENstructureEN[1,2,2,3,4,5,5,2];
val it =
[[],[N],[N,E],[N,N,N],[N,N,N,N],[N,N,N,N,N],[N,N,N,N,N,E],[N,E,E,N,N,N,N]]
: EN list list

ENstructureEN of Ullapool

v	–	–	–	–	–	–
v	***e***	–	–	–	–	–
v	*v*	*v*	–	–	–	–
v	*v*	*v*	*v*	–	–	–
v	*v*	*v*	*v*	*v*	–	–
v	*v*	*v*	*v*	*v*	***e***	–
v	***e***	***e***	*v*	*v*	*v*	*v*

Obviously, the matrix is not symmetric, therefore "Ullapool" is, stubbornly, not a palindrome.

Hence, the composition of the 2 palindromes, "Ulla" and "Pool", is resisting palindromicity.

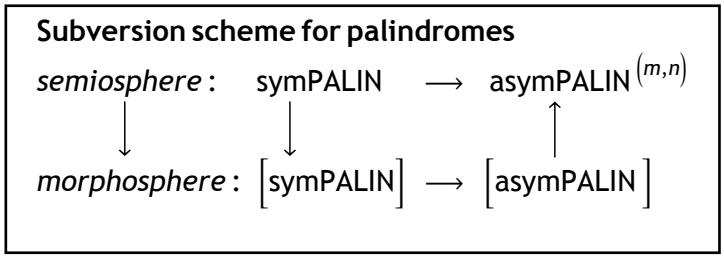
Is Ullapool a loop?

Ullapool is Ullaloop:
ENstructureEN([num(Ulla)],[num(loop)]) = ENstructureEN([num(Ul-la)],[num(pool)]),
ENstructureEN[num(Looppool)] = ENstructureEN[num(Poolloop)],
Thus, Ullapool is a Loop pool.

Training

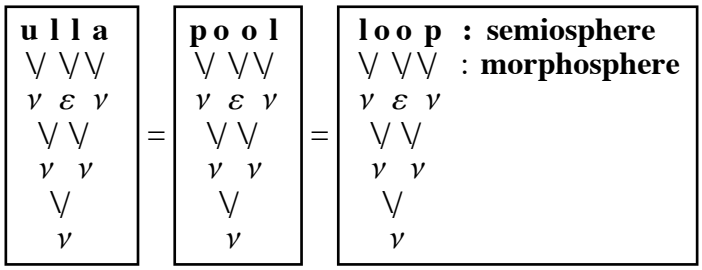
Calculations of this kind have to be learned and trained to take us to a new level of awareness where differences and not entities are guiding the awareness.

It might be helpful to use this little diagram as a guide for a general orientation in the process of explication and defence of the subversive turn.



Example

⟦1,2,2,3⟧ = [[N],[N,E],[N,N,N]]



The slogan to be defended

Also the same ‘same’ is different, the way back is not the same as the way forward or the way back. The way forwards depends on the way back as much as the way back depends on the way forwards and all together are not the same. But different and albeit their difference the same.

Labels to repeat

Non-repetitive loops, asymmetric palindromes,

1.1.2. Time and repetition

"Repetition is a form of change.” – Eno

> "What then is time? If no one asks me, I know what it is. If I wish to explain it to him who asks, I do not know.” — Saint Augustine
>
> “No man ever steps in the same river twice, for it's not the same river and he's not the same man.” — Heraclitus
>
> "Here's a new thing based around palindromic loops - if you could play the loops backwards in isolation they should sound the same. The only use of a sequencer was to run the drum track (which is deliberately out of sync with the loops).

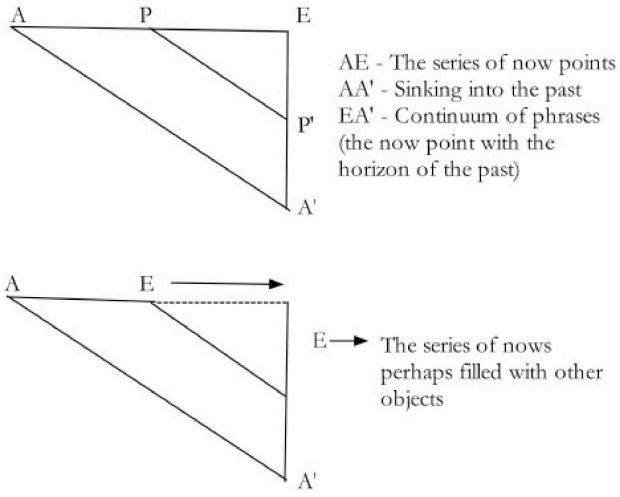
> "A fairly minimal system-based thing created from a set of related loops that shift over and around each other."(Shaun Bailey)
> http://www.artistserver.com/iridium
>
> "A loop is a sample of a performance that has been edited to *repeat seamlessly* when the audio file is played end to end." (Hawkins 2004, p. 10)
>
> "To varying extents, repetition has always been part of the musics of all cultures, but only in the 20th century, it became a style, a musical form of its own. Inspired by the meeting of world cultures, aided by technology, pioneered by visionary composers, looping music was born."
> http://www.loopers-delight.com/history/Loophist.html
>
> "Because they can be read both backwards and forwards, palindromes emerge as *multilayered*, *multidirectional*, and *polytemporal* mappings reflecting the notorious instability of human lives, where the ever shifting present oscillates between the past and the future.
>
> "In contemporary fiction, such palindromic vacillation becomes an iconic representation of *temporal* shifting, allowing us to discern the texture of temporality, not as abstractly conceived but as concretely lived and hence as innovatively performing an unstable present."
> http://benjamins.com/#catalog/books/ill.5.21lju

Despite the subversive wordings, like "*the texture of temporality"*, the heroic attempts rest in regression.

As ubiquitous in Western culture, transgression is hallucinated by denial: *"not as abstractly conceived but as concretely lived"* and by profound regression into the pre-notional and unspeakable and definitively un-calculable transcendence which gets the honor to be more real than the real as the "concretely lived".

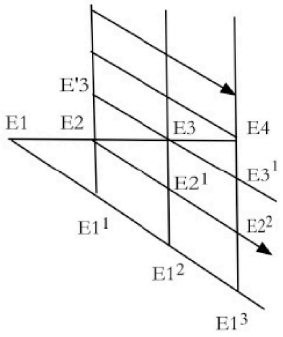
According to Husserl, to perceive is to interpret

> "Every preceding protention relates to every succeeding one in the protentional continuum like every succeeding retention relates to the preceding one in the same [retentional] series. The preceding protention intentionally includes all the later. It implies them. The successive retention intentionally implies all the earlier."
>
> "Primary *memory* of the tones that, as it were, I have just heard and *expectation* (protention) of the tones that are yet to come fuse with the interpretation of the tone that is now appearing and that, as it were, I am now hearing"(PdiZ, p. 35).



"As Husserl expresses this, in directing my attention to a sounding tone, *"I immerse myself attentively in the 'crosswise intentionality'"* of the flow. When I do so, *"the enduring tone stands before me, constantly expanding in its duration"* (PdiZ., p. 82). It does so because the *"intentional phases"* presenting its expiring movements *"are displaced … they pass over into one another precisely as phenomena of one thing, which is shaded-off in the flowing phenomena"* (ibid., p. 117).

Figure 1



James Mensch, Husserl's Account of ourConsciousness of Time
http://www.academia.edu/590652/A_Brief_Account_of_Husserls_Doctrine_of_Time_Consciousness_with_Accompanying_Translations

Also Husserl gives several explicit description of the time-diagrams, he is not offering much information about the '*mechanism*' into which such phenomenological experiences are involved.

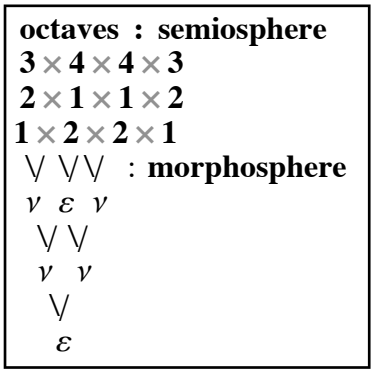
A further analysis would uncover elements of a *chiastic* figure that is ruling the interplay of 'retention' and 'protention' in constituting the '*now*' in the flow of 'perception' of '*not-yet*', '*right-now*' and '*no-longer*'. The hint is given by Husserl with the term '*crosswise*' (or transversal) intentionality (Querintentionalität). And also: 'Längsintentionalität', or as Eugen Fink calls it: 'Gegenwärtigung' and 'Entgegenwärtigung'. Conceived as a chiasm, some steps towards an operational theory of time-conscious could be achieved and the simple linerarization of the metapher 'flow' abandoned.

Retro-grade recursion that constitutes a melody

All those *retro-grade recursions* are constitutive to hear a *melody* in contrast to a succession of isolated tunes. This observation to handle a melody as a relational pattern is well known from Gestalt theory but its conceptualization and formalization never succeeded to convince logicians. Nevertheless, this Gestalt concept belongs to the semiosphere, and is not intended in this study of a morphic approach to music.

> *"A similar structure can be discovered if we describe the experience of a melody. Each note in a melody has a musical quality which depends on the place of the note in a sequence of notes. We do not hear a note as an objective frequency but as the musical quality that fits in at that point in the melody. Indeed moving the whole tune up an octave does not change the experience of the melody, although the objective frequency of every note is changed."*
>
> http://www.ucs.mun.ca/~davidt/TimeHsrl.html#B.%20MELODY

A simple model of the 'octave change' of a 'sequence of notes' that is preserving its melody might be given with the different semiotic interpretation of an ε/ν-structure.



Morpho-analysis is not phenomenological

The phenomenological approach that is emphasizing a "phenomenological attitude" in contrast to a "natural attitude" is focused on the phenomenon itself. The grammatological and morpho-analytical approach (attitude, intervention) is 'focuse'd' on the character of the inscription of such phenomenal events (opening up space, time and subjectivity).

> "Here, Ihde follows Husserl's claim that the phenomenologist must reconsider his habitual or learned presuppositions. Further, Ihde recommends that the Hussserl-inspired focusing should be followed by a Heidegger-inspired process, letting the phenomenon *"show itself in itself"* by gradually excluding irrelevant factors (Ihde 2007:217-218, Heidegger 1962:51)

It seems that *morpho-analysis* goes a step deeper. Not the phenomenon as such in the mode of the 'same same in itself" is the leading attitude but the uncovering and un-masking of the phenomenon as the "same as different", i.e. as the same being constituted by its retro-grade recurs to its otherness as the different.

> "To go *"to the things themselves"* does not mean to study things as isolated objects in the world, separated from the observer's activity. On the contrary, it means to investigate the relationship between the object

> and the process that allows the appearance of the object in consciousness."
>
> http://vbn.aau.dk/files/68298556/MUSIC_LISTENING_FINAL_ONLINE_Erik_christensen12.pdf

Such declarations are well known in philosophy and have a history of repetition. The question: How does it work? Hasn't been tackled properly and has left the sentence in its status as a believe sentence.

It is not the place here to repeat such an attitude again. Nor is it possible to go deeper into the matter of an attempt to operationalize its intention. A quote of an earlier analysis might do the job for the moment.

Nevertheless, there exist a little guide how to achieve such an operationalization related to the task of understanding the activities of protention and retention to reach a level of the "*Sachen selbst*".

> *"Es soll hier dafür argumentiert werden, daß der Mechanismus des Oszillierens bzw. der Symmetriebrechung einer Zwei-Seiten-Form zur vollständigen Strukturbeschreibung insgesamt sechs Standpunkte bzw. Thematisierungen involviert.*
>
> *"Durch den Durchgang durch alle strukturell möglichen 'subjektiven' Beschreibungen durch den Observer wird das Objekt der Beschreibung 'objektiv', d.h. observer-invariant 'als solches' bestimmt. Das Objekt ist also nicht bloß eine Konstruktion der Observation, sondern bestimmt selbst wiederum die Struktur der Subjektivität der Observation durch seine Objektivität bzw. Objektionalität. Der auf diesem Weg gewonnene Begriff der Sache entspricht dem Mechanismus des Begriffs der Sache und wird als solcher in der subjekt-unabhängigen Morphogrammatik inskribiert."*
>
> Diskontexturalitäten: Wozu neue Formen des Denkens? Zur Kritik der logischen Voraussetzungen der Second Order Cybernetics und der Systemtheorie. (Kaehr, 1994)
>
> http://www.vordenker.de/ggphilosophy/diskontext.htm

In a nutshell:

For the operative description of the 'oscillations' between retentional and protentional acts a contextural complexity of at least 6 different thematizations, realized by 6 mediated contextures with their internal techniques of logic, arithmetic and other methods, is required.

The polycontexturality of the protention/retention form

1. Thematization of the 'first' half of the form: *protention*,
2. Thematization of the 'second' half of the form: *retention*,
3. Thematization of the 'oszillation' of '*protention and retention*',
4. Thematization of the *inversion* of the order of 'protention and retention',
5. Thematization of the 'oszillation' of *'retention and protention'*
6. Thematization of the 'oszillation' of 3. and 5.:
   (protention/retention)/(retention/protention).

List of some earlier work(1987 to 1993):
http://www.vordenker.de/pkl/forschungsprojekt_publlist_87-93.pdf

Music creates time

> *"Music does not "unfold in time". Music creates time, and the sensation of musical time is basically different from measured clock time. Music*

> *listening gives rise to three kinds of temporal experience, The Time of Movement, The Time of Pulse, and The Time of Being."*
> Music Therapy, Phenomenology, and Neuroscience, PhD proposal by Erik Christensen

1.1.3. Invention and surprise beyond predictability and decidability

The flow of 'now' as a chiastic interplay of 'protentional' and 'retentional' activities to characterize the temporality of sonic events give no answer to the question: How are sonic surprises as forms of inventions and creativity embedded into such temporal flows?

How is it possible in this concept of time to *surprise* the expectation of the protention? But also, how could the memorized retention be surprised by the expectation of retentionial acts?

A simple wording might help to tackle this crucial question. If we understand the 'now' as an interplay of protention (anticipation, *expectation*) and retention (memory) logically, it might be seen as a 'union', 'conjuction' or simply as a 'togetherness' of both, the retentional and the protentional activities of the perception in time. Diamond logically, it might be conceived as the 'both-at-once' of protention and retention.

To understand the diamond logical approach better, it is necessary to see, that diamond concepts are reflectional, i.e. second-order concepts. While the terminology of Husserlian analysis with protention and retention is of first-order reflectional awareness.

That is, for Husserlian analysis, protention is protention and retention is retention.

Second-order reflections are dealing not with a binary couple of retention and protention but with a ternary interactional grid.

Hence, things have to be set into the minimal quadruple:

1. protention of protention,
2. protention of retention,
3. retention of retention,
4. retention of protention.

A more profund reading of Husserl's phenomenological analysis might confirm parts of this 'second-order' or reflectional quadralectic approach.

Hence, an opposition to such a *'texture of flow'* might be seen as a *rejection* of this logical figure of conjunctive 'both-at-once', i.e. as the 'neither-nor' of 'protention *and* retention'.

Hence, what *surprises* in a sonic 'flow' is the 'neither-nor' of the memorized retention and the anticipated protention of the event.

Obviously, morphogrammatic time analysis is not based on '*tensed time*' propositions. Therfore, it is a very different kind of the attempts to thematize time. A more polycontextural approach is presented at: http://www.vordenker.de/vgo/vgo_publications.pdf.

What we can take as the new approach of analysis of time is the insight that time is not a 'first-order' concept but a 'second-order' field of interaction. Hence, time is not subsumed to Being, neither to ontological or gnoseological events. Or to subjectivity and its 'introszendence". Therefore, there is no *Logic of Time* in the sense of proposition-based *Temporal Logic* adequate for

its understanding. There might be a *Time of Logic* to uncover.

> *"But even if we leave these metaphysical issues aside, it is obvious that time plays such a fundamental role in our thinking that there is a clear need for precise reasoning about it, such as we see in Physics, formal Linguistics, Computer Science, and Artificial Intelligence. While these enterprises are not necessarily concerned with the same concept of time, they all could go under the heading of* Temporal Logic." (Yde Venema)

A sentence based analysis of time structures in the sense of analytical philosophy and 'Temporal Logic' is presented by Yde Venema, Temporal Logic, at:

http://staff.science.uva.nl/~yde/papers/TempLog.pdf

This surprising phenomenon or the phenomenon of surprise might be modeled or understood from different approaches of polycontextural logic and morphogrammatics.

One of the simplest possibility, in the context of those thoughts, might be conceived as a change of the *mode* of iterability of the palindrome in play, say from its 'repetition' to its 'inversion' or its iterative 'accretion'.

Following this frame of thinking, the next non-anticipated move of a sonic event might be experienced by a change of the '*complexity*' of the palindrome in the process of repetition ("iteration alters").

All that is possible in the framework of morphic palindromes and their dynamic fields of realizations. Accepting the paradigm of the semiosphere with its logic and arithmetic of identity, iterability is limited to the bones, all that in the believe that only such a skeletal thinking is accessible to formalization and operativity (computability).

Questions of decidability are well elaborated for formal languages.

Albeit music production is not at all developed in the framework of formal languages, some connections are nevertheless possible, and studied elswhere.

Music, to be creative has to be *undecidable* in the process of performance.

This approach is in conflict with the compositional strategy of repetition and looping palindromes.

On the other side, the main strategies to demonstrate undecidability of formal systems, the very process of iteration is crucial. Iteration, in this context, comes as '*quotation*' and/or as '*substitution*' in the process of self-applications.

http://memristors.memristics.com/Godels%20Palindromes/Godels%20Palindromes.html

Alain Badiou, Philosophy as Creative Repetition

> *"The fact that philosophy is largely a* repetition *of its act clarifies the immanent affinities between philosophers.*
>
> *"Deleuze with Leibniz and Spinoza; Sartre with Descartes and Hegel; Merleau-Ponty with Bergson and Aristotle ; I, myself, with Plato and Hegel; Slavoj Zizek with Kant and Schelling... And maybe, for almost three thousand years, everybody with everybody."*

Why is it boring to follow Alain Badiou and his followers?

> *"And Derrida transformed the classical approach of rigid metaphysical oppositions partly because of the growing and irreducible importance, in our experiences, of their female dimension.*

> *"That's why we can speak finally of a creative repetition. There is something unchanging in the form of a gesture, a gesture of division. And there is, with the pressure of some events and their consequences, the necessity for transforming some aspects of the philosophical gesture. So we have a form, and we have the variable form of the unique form. That's why we clearly recognize philosophy and philosophers, despite their enormous differences and despite their violent conflicts.*
>
> *"But what is this "same"? What is the sameness of the same, which returns in the a-historical destiny of philosophy? Behind this question we naturally find an old discussion about the true nature of philosophy."*
>
> http://www.lacan.com/badrepeat.html

Those deep insights of (modern) philosophy gets some formal and diagrammatic treatment.

As I had to learn from our young philosophers, Badiou's treatment of the question of "repetition" by his formalisms and diagrams is not intended to be a joke. Lacan had at least some Heideggerian humour hidden in his pathetic stubbornness.

More entertainment about *"Alain Badiou. Infinity and Set Theory: Repetition and Succession"* at: http://www.youtube.com/watch?v=LJ70jKsk3gs

Subjectives Types

A. Three Letters

ε : trace on an event
C : subjectivable body
π : new present

B. Five Operations

$\Longrightarrow$: implication
$\overline{}$: line
$/$: crossing out
$\neg$: negation
$=$: extinguishing

C. Three Subjective Types

Faithfull

$$\frac{\varepsilon}{\not\varepsilon} \Longrightarrow \pi$$

Reactionary

$$\frac{\neg\, \varepsilon}{\dfrac{\varepsilon}{\not\varepsilon} \Longrightarrow \pi} \Longrightarrow \pi$$

Dark

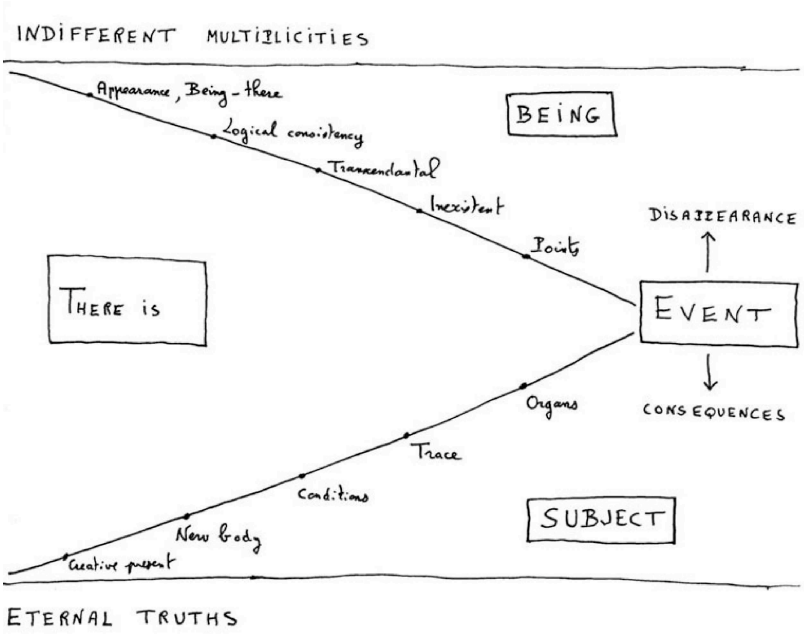
$$\frac{C \Longrightarrow (\neg\, \varepsilon \Longrightarrow \neg\, \not\varepsilon)}{\pi}$$

D. Four Destinations

To produce (create). To deny. To remove (get rid of). To revive (raise)

Sounds, therefore, are embedded into the framework of "*Events*" that happens between the "*Being*" and the "*Subject*" engulfed by "*Eternal Truths*"

and "*Indifferent Multiplicities*".



1.1.4. Repeating quotes

Are quotations, repeated in different contexts, still the same quotations as in their original situations? Are quotations, set in different contexts and altered by such context-change, still quotations in the original sense?

Repeating quotes from Brian Eno:

"You can't really imagine music without technology."

"I don't live in the past at all; I'm always wanting to do something new. I make a point of constantly trying to forget and get things out of my mind."

"Treat the recording studio as a laboratory for conceptual thinking -- rather than as a mere tool."

"What matters in modern music is not the part you can write down, the words and the tune, but the rest - the texture, the atmosphere, the references and associations."

Read more at http://www.brainyquote.com/quotes/authors/b/brian_eno.html#4KRXYd4QOUOUk3rW.99
http://musicthoughts.com/author/2

Samuel Weber on repetition

"Any attempt to provide a simple answer to the question of whether or not repetition is 'possible', whether or not 'there is repetition', presupposes that the notion of the 'possible', and of the 'there is' are simple and straightforward. It is precisely such simplicity and straightforwardness, however, that the problematic movement of repetition calls into question.

"The Future of Humanities: Experimenting." in: Culture Machine. 2000.

For wherever it is a question of repetition, technology and telecommunication are never very far away. Why? Because, as Benjamin was perhaps one of the first to clearly state, the mode of being of modern technology

> is repetitive and reproductive. The 'work of art', so Benjamin insists, must henceforth be discussed with respect to its intrinsic 'reproducibility'. And such reproducibility involves inscription: the tracing of traits: photography, cinematography and now, we might say, videography."
>
> "The media also provide an immediate answer to their own question, again and again: the answer of a repetition that presents itself as the return of the same, as ultimately self- contained, and in this sense, as just that self-enclosed separation for which the modern subject has always, in a certain sense, yearned: the self-contained space of the 'in-dividual'."
>
> Weber, Samuel. "The Future of Humanities: Experimenting." in: Culture Machine. 2000.

Samuel Weber on '*doubles*' and '*ghosts*'

> "If Theater for Artaud - and not just for him - is always a question of "doubles" and of "ghosts", could it be that the Theater of Cruelty is in some sense haunted by Aristotle? By the very tradition against which Artaud also rebels? And if this were so, what would it tell us of the relation of "doubles" and "ghosts" to their "originals"? And hence, of the nature of theater as the medium of such duplicity?"
>
> Weber, Samuel. "The Virtual Reality of Theater." in: The Hydra. University of California, Irvine. Sydney, Australia. September, 1996.

A kind of predecessor of the present studies of morphic, i.e. asymmetric palindromes, was published 2004 as "*Sushi's Universal Logic Catalogue – The Ultimate Lambda Pow(d)ers*"

http://www.thinkartlab.com/pkl/media/SUSHIS_LOGICS.pdf

And more specifically by: "*How to compose?*" (2007) in: *Towards_Diamonds*

http://www.thinkartlab.com/pkl/lola/Towards_Diamonds.pdf

Quotations taken out of context

Quotations taken out of context, and contexts taken in as quotes. Chiastic repetition without neither changing nor iterating the quote.

Palindromes seems to be a paraplui for nearly everything that has a chance to repeat itself.

Existential and emotional experiences with the change from palindromes to anti-palindromes.

Existential self-understanding was changed for Annah by the non-pronounced linguistic move from Anna to Annah.

The thinker Jaques Derrida moved the whole occidental thinking into a new epoch of thinking by changing the fundamental notion of difference to the hidden anti-concept *differance*.

What's about a loop that sounds different if repeated?

A loop sounding the same played forwards and backwards is palindromic. But there are palindromic loops that sound different played forwards and backwards again. How is that possible?

How to play sounds you can't hear?

Morton Feldman's fight against the objectification of notes and tunes.

At this time I was occupied with kenogrammatics and non-objectifiable notational systems and not with the question how to play tunes you will not

be able to hear.

The solution at this time was the discovery of silence, nothingness and negativity. But not the discovery of emptiness and its operational structures as it was proposed by Gotthard Gunther.

Yves Klein in painting did some transitional steps from the nothingness to the emptiness.

1.1.5. Anti-palindromes of repetition

How would it sound if it would be the "same" sound but different? Not a different sound to the first sound and also not the same sound to the first sound but both together: the same sound and at once a different sound?

A very elementary model of such an approach is given by the concept and mechanism of morphic *palindromes*. Each loop of the palindromic movement or sequence is diferent as a sequence but the same as a pattern. And that's just what matters. What's of interest are not sounds but patterns of sound, and pattern beyond sounds.

We hear such patterns of sounds not as perceptions but as thoughts of perceptions, i.e. by cognitive perception. Cognition of perception and perception of cognition are the gnoseological devices, and not the bravely distinguished first-order faculties of perception and cognition as such.

The iterative repetition lacks inspiration. Hence, the trance to such iterative music has to be induced and supported by other means that are as such not related to the sound-event.

The efforts to overcome tonal music, i.e. music of what ever kind, based on tunes, notes, sounds, towards a-tonal or non-tonal music is still based on the perception of tonal or sonic units, may they be called, a-tonal sonic entities.

A great "palindromic" piece, defended as a "sonic event", was performed by Anthony Moore at the KHM, Cologne, about 2002.

What is music that is not primarily percieved, auditively, but recognized by thinking? Thinking of sounds is not making any sense if it is sufficient to perceive the sounds as a system of tunes in whatever order and modus.

Thinking is involved in thought-wise recognition of the differences of the tunes. It is not connected to hallucination because hallucination is a form of perception and not of cognition.

This is well known in analogy to the 'differentialism' of the linguist and semiotician Ferdinand de Saussure, and its radicalization by the graphematics of Jaques Derrida.

Nevertheless, these principles didn't got any serious acceptance, and had been probably never been applied for the composition of 'music' as sonic events of differences.

There is also not much notification in other fields, like semiotics or linguistics. Only recently, some attempts to apply 'difference-structures' to foundational problems of linguistics and logic in form of ϵ/ν-structures appeared in literature (Udo Klein, Marcus Kracht).

Morphogrammatics of repetition

How is the new morphogram be generated if the successor operation is not able to make recurs to an external resource? At least there is still an internal resource given, i.e. the encountered morphogram. Hence, the encountered

morphogram offers all possible continuations of itself. This happens as an *iteration* of its parts (monomorphies or kenograms) and the generosity of adding something new to the encountered morphogram by accretion.

As much as the range of iteration is ruled by the structure of the pre-given morphogram, the range of the new is restricted by the morphogram too. The new is new only in respect to the morphogram and not in respect to an imaginary repertoire of unlimited resources.

This is in a very hard contrast to *continuations* in semiotics. Semiotic sign sequences might be prolonged by any sign of the pre-given external repertoire, independently of the structure of the sign sequence, and independently of time, space and matter too.

Hence, a *pro-gression* of a morphogram is involved into a simultaneous *retro-gression* of the continuation operation. But this alone is not yet guaranteeing a successful operation. There is still the possibility open that pro- and retro-gression don't meet at the meeting point. To match, conditions of matching have to play their part. Re-entering the entry excludes the possibility to miss the re-entrance.

Hence, an interplay of forwards and backwards, pro- and retro-, has to manage the game. Until now, this management has been guaranteed by the designer and administrator of the system, and not by the concrete operations in concrete situations.

The desired prolongation as the start has to select the element of prolongation in the given morphogram by a retrograde action as the end. This end, as a chosen element, i.e. as the begin of the progression action, has to be put as the end of the prolongation activity at the new morphogram.

The mechanism is defined as a *chiasm* between progression, retro-gression, begin (choice) and end (selection) over two loci (places of morphograms).

Instead of just writing a self-cycle of a mapping into itself to produce a successor, the self-mapping is made operationally explicit and visible with a distribution of the morphogram as the given, the addressed and as the producing (prolongating) morphogram and finally its result, the changed morphogram.

Iterability in a strict sense

"Thus, the full scheme of the *Fixedpoint theorem* is now marked by its numbers of occurrence of the term "W" in the application. Following Wittgenstein's advise that the meaning of a term is defined by its *use*, at least 6 different use of the term "W" are to distinguish in Barendregt's proof.

Fixed – point scheme

Define $W^1 \equiv \lambda x.F(xx)$ and $X \equiv W^2 W^3$.
Then
$X \equiv W^2 W^3 \equiv \lambda x.F(xx)\,W^4 \equiv F\left(W^5 W^6\right) \equiv FX$

"With Barendregt's formula for the construction of the *Fixed Point Theorem*, the term "*W*" is used [repeated] 6 times and therefore we have to check all its possible ways of use. The comfortable excuse to use the

distinction of a syntactic and a semantic or of an object- and meta-language use of the terms, say 'use' and 'mention', to avoid further analysis, isn't of leading importance in this case."

"There are at least 4 possible types of modeling:
1. identitive *equality* (semiotics),
2. kenomic *equivalence* (kenogrammatics),
3. morphic *similarity* (morphogrammatics),
4. metamorphic *bisimilarity* (metamorphosis)."

http://memristors.memristics.com/Godels%20Palindromes/Godels%20Palindromes.pdf

1.1.6. Terry Riley, minimalism and morphogrammatics

Notes on the fly: Terry Riley, minimalism and morphogrammatics

The idea is that repetition in minimal music and spiritual music that involves and demands from the listener a kind of a trance is not the semiotic but the palindomic iteratibility as it is developed in the theory of asymmetric palindromes.

There wouldn't be any reason to repeat the pattern until trance if the trance wouldn't be the level of consciousness necessary to understand the morphogrammatic structure of the music.

The music might be by a first understanding still semiotic but the trance is elevating the consciousness to the level of morphogenese that's beyond identitive attitudes of understanding.

Bachs variations, despite their mystical effects, are more combinatorial than morphic.

Considering palindromes in music productions, a different perspective is possible.

A classical palindrome, thematized morphogrammatically, might be representing some aspects of morphic cases of palindromes but will nevertheless be conceived as a classical palindrome. As shown in the paper "Morphosphere(s)" a classical palindrome is hiding its morphic structure producing a "Tromp-l'oeil" of perception.

Palindromes with reversion, repetition and accretion are all palindromes, summarized by the classical palindrome.

Hence, repetition has many faces thematized from a morphogenetic and music productional point of view.

Such ideas, and further speculations, are based on intuitive insights.

Obviously, they have to be checked scientifically.

But that's just the problem. Science, in this case, semiotics, has not yet developed methods to cope with such paradoxical phenomena as asymmetric palindromes.

(Glasgow, 30.06.2013)

1.1.7. La trance sans dance est la dance sans trance

Sampling with repetitive loops of sounds without alterations and alterations as palindromic iterations of the different are building a conflictive polarity that is neither reflected nor technically realized in electronic music compositions and events.

Those two habits, which shall be called the *trance without repetition* and the *iteration without trance*, had been poetically elucidated by the poeme of Jaques Prevert on the philosophical attitude of the adepts of Husserl's transcendencendental philosophy.

Jaques Derrida's response is well known but it reception was reduced to a phrase with a high amplitude of repetitions but remained nevertheless without much insight and attempts of possible realizations: *"Iteration alters*."

Hence, classical iterability of iteration, i.e. iteration without alteration, implies the whole machinery of logocentrism (identity, space, time, self).

> "*Play is the disruption of presence. The presence of an element is always a signifying and substitutive reference inscribed in a system of differences and the movement of a chain. Play is always play of absence and presence, but if it is to be thought radically, play must be conceived of before the alternative of presence and absence (SSP 292)*." (Derrida)

Therefore, the slogan *"iteration alters"* has to come into the game again. Probably in a different way. As it is well known, a formalization of iterability as an intra-contextural process and as a trans-contextural event is approached with the distinction of elect for contextures and select for the iteration of the operations of contextures.

http://memristors.memristics.com/MorphoReflection/Morphogrammatics%20of%20Reflection.html

anti-Palindrome: Annah's brocken symmetries

Both readings of a morphic palindrome, the right and left turn, are broken symmetries.

Don't destroy the crutches. They are useless in the semiosphere. But we will need both of them in the realm of the morphospheres to give orientation to our journeys where the dichotomies of right/left and sound/silence are dissolved and obsolete.

"*Anna*" is a repetive palindrome in the classical sense. But "*Annah*" is a broken palindrome.

Depending on the language used, the spelling of "Annah" and its reverse "Hanna " is symmetric or asymmetric, "Annah" and "Hanna" is linguistically not always "Annah".

What makes the difference, and is disturbing palindromy by asymmetry, is the letter "h" that isn't prononced and isn't 'given' to the ear in "Annah".

The concept of Resisting Palindromes

> "The concept of Resisting Palindromes has held space for me to challenge the stagnancy I associate with identifying by a given-name I no longer relate to (as I have transformed in drastic ways since it was first assigned to me), and it also reminds me of the commitment I've made to myself, to consciously resist participating in the destructive patterns I've learned over time."
> http://annahantipalindrome.com/about-annah-anti-palindrome/

Resisting palindromes is a fight against Aristotelian Ghosts. Against the ideology of the origin and the denial of the equality (equi-primordiality) of the second towards the first.

In fact, classical palindromes want, despite their circularity, to establish and re-establish a hierarchy between the first and the second, and therefore deny-

ing the chance of a heterarchical interplay between both. This attitude of hierarchization is realized with the exploitation of symmetry and the sacrifice of any asymmetic developments of sound structures.

In a more transcending order we are reminded to the quotation from "*Diamond Short Studies*":

> *"La transdisciplinarité concerne, comme le préfixe "trans" l'indique, ce qui est à la fois entre les disciplines, à travers les différentes disciplines et au delà de toute discipline. Sa finalité est la compréhension du monde présent, dont un des impératifs est l'unité de la connaissance."* Basarab Nicolescu (1997)
>
> http://www.thinkartlab.com/pkl/media/transMODULE/HTMLLinks/index_12.html

1.1.8. Vizualisation and reasoning

> *„But visualisation is not a 'cognitive artifact'; it does not (nor does it attempt to) support rational problem solving.*
>
> *"Rather, it presents existing information in a way that changes the sensual experience of observers, as compared to the original formulation of that information. In other words, visualisation and related techniques of media-translation act as sensory transducers that change human perception not human problem solving. This change may then result in the observer having new insights into the information presented, insights that will affect how he reasons about the phenomena.*
>
> *"Such creativity arises from support for rich sensual experience, not from enhanced reasoning abilities."*
>
> http://www.interactiveinstitute.se/tools/eng/eng_index.html
>
> *"Medien sind deshalb nicht nur Geräte, sondern auch Metaphern, rhetorische Figuren, emphatische Versprechungen. Alle Medien sind abhängig von den Grundfaktoren menschlicher Imagination und Wahrnehmung. Das ist, was keine Revolutionierung der Ästhetik wird ändern können, solange wir überhaupt noch von Imagination sprechen. Die Vorstellbarkeit von Welten bleibt immer noch abhängig von der Welt unserer Vorstellungen."*
>
> Hans Ulrich Reck »Neue Medien«: Selbstverständlich geworden?, Interface2000 Hamburg

Reck's statement, "*Die Vorstellbarkeit von Welten bleibt immer noch abhängig von der Welt unserer Vorstellungen.*" got it on the point. It could be used as a perfect slogan to summarize a view on creativity as we know it since Aristotle and that has become obsolete at last since Mallarmé. Unfortunately, the elaborations of the philosopher Martin Heidegger on the deconstruction of such notions like "*Vorstellung*" (representation) and its metaphysics of production are rejected by ignorance.

The chain of linearity and atomism is: Representation ⟶ Sign ⟶ Number ⟶ Computation ⟶ Logic ⟶ ...

http://www.thinkartlab.com/pkl/media/about.html

1.1.9. Psychology of perception

Jeff Zacks and Barbara Tversky, Event Structure in Perception and Concep-

tion (Stanford)

"Events can be understood in terms of their temporal structure.

"Here, we draw on several bodies of research to construct an analysis of how people use event structure in perception, understanding, planning, and action.

"Philosophy provides a grounding for the basic units of events and actions. Perceptual psychology provides an analogy to object perception: Like objects, events belong to categories and, like objects, events have parts.

"These relationships generate two hierarchical organizations for events: *taxonomies* and *partonomies*.

"Event partonomies have been studied by looking at how people segment activity as it happens.

"Structured representations of events can relate partonomy to goal relationships and causal structure; such representations have been shown to drive narrative comprehension, memory and planning.

"We will take an event to be a segment of time at a given location that is perceived by an observer to have a beginning and an end.

"We will call the process by which observers identify these beginnings and endings, and their relations, event structure perception.

"Event perception can be regarded as the temporally extended analog of object perception: Events are objects in the manifold of the three dimensions of space plus the one dimension of time."

http://dcl.wustl.edu/pubs/ZacksPsychBull01.pdf

Hence, how are palindromic events handled in perception and conception? It turns out that morphic palindromes are not concptualized and recognized properly if they are categorized as objects or as events with all their additional secondary taxonomic and partonomic abstractions.

The human mind – an ultimate Walkman?

"During this process I discovered that the internal listening of familiar favourite music did not seem to adhere strictly to the *linear* and *objective* temporal order; on the contrary, by way of protention and retention, by orienting oneself to the "running off" of music or to its "following up" for the present, music in the musical imagination could be temporally modulated to suit my exact preferences."

http://www.popular-musicology-online.com/issues/04/aho.html

1.1.10. Bisymmetry as a mechanism of cognitive perception of palindromes

Palindromes are not given to the perception as such. Neither as objects nor as events. Objects and events are embedded in a linearized understanding of time and space. They are also not 'seen' by a phenomenological procedure as the phenomena of palindromy.

Morphic palindromes have to be actively constructed (constituted) by the perceving cognition.

Perception of morphic palindromes is a construction and not a sensual apperception or an abstraction of physical data.

The constructive awareness of morphic palindromes is guided by the construction of a bisymmetry of the presented 'material'. If this material, i.e. the

events of differentiations, fulfils the criteria of bisymmetry then it is reasoned as a palindromic event.

Hence, a simple complexion of differences, like [[],[N],[N,E],[N,N,N]], concretized by the localizations of its differences as [[],[(1,2,N)],[(1,3,N),(2,3,E)],[(1,4,N),(2,4,N),(3,4,N)]], has to by involved into the procedures of bisymmetry.

Taken the same structure as the keno-sequence [1,2,2,3], its palindromy is easily shown: kref[1,2,2,3] $=_{MG}$ [1,2,2,3]. But with this approach we don't get any information about the difference-theoretic status of the palindrome.

- ENtoKS [[],[(1,2,N)],[(1,3,N),(2,3,E)],[(1,4,N),(2,4,N),(3,4,N)]];
val it = [1,2,2,3] : int list

Thus, bisymmetry is a mental activity to establish palindromy of differentiated patterns, i.e. of ϵ/ν-structures. Its formalization is surprisingle simple:

$$\mathrm{rev}_{\mathrm{cols}}\left(\mathrm{rev}_{\mathrm{rows}}\left(\mathrm{ENstructureEN}\right)\right) =_{\varepsilon/\nu} \mathrm{rev}_{\mathrm{rows}}\left(\mathrm{rev}_{\mathrm{cols}}\left(\mathrm{ENstructureEN}\right)\right)$$

Or more explicitly:

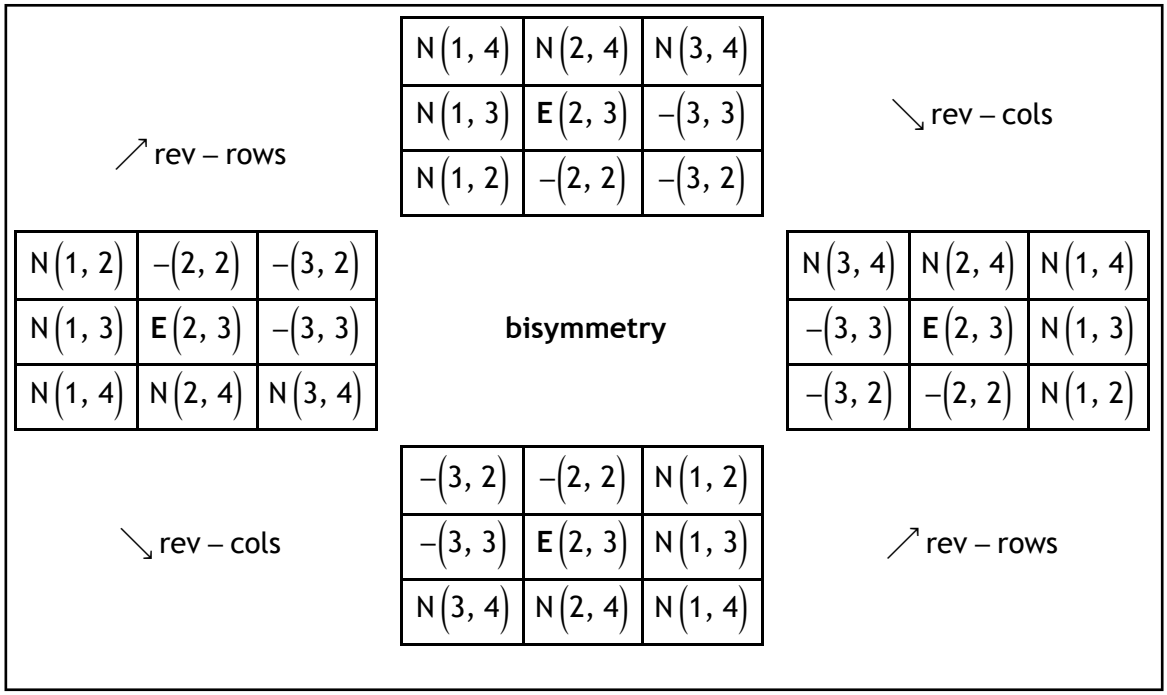
Bisymmetric invariance

$$\forall\ \mathtt{cols},\ \mathtt{rows} \in \left(\varepsilon \mid \nu - \left[\mathtt{MG}\right]\right) :$$
$$\mathtt{rev}_{\mathtt{cols}}\left(\mathtt{rev}_{\mathtt{rows}}\left(\varepsilon \mid \nu - \left[\mathtt{MG}\right]\right)\right) =$$
$$_{\mathtt{bisym}}\ \mathtt{rev}_{\mathtt{rows}}\left(\mathtt{rev}_{\mathtt{cols}}\left(\varepsilon \mid \nu - \left[\mathtt{MG}\right]\right)\right)$$

That is, the ϵ/ν-structure of a morphogram is a palindrome under bisymmetry iff the reversion of its columns and rows is *invariant* under the inverted reversion of its rows and columns.

Bisymmetry is a simple but fundamental mathematical tool to represent more directly conceptual notions like antidromy, chiasm, enantiomorphy, duality and complementarity.

The bisymmetry construction of the morphogram MG = [[],[(1,2,N)],[(1,3,N),(2,3,E)],[(1,4,N),(2,4,N),(3,4,N)]] gives the answer about its palindromicity.



The construction is obviously accepting the conditions of bisymmetry and is therefore defining a morphic palindrome.

$$\text{pal}\left(\left[\text{MG}\right]\right): \text{ENstructure} \longrightarrow \text{ENstructure},$$
$$\text{modulo}\left(\text{rev}_{\text{row}}, \text{rev}_{\text{cols}}\right) \in \text{Com}$$

Stripped of the explicit notation of the positions of the differences by the function ENstructureEN of the 'event' ⟦1,2,2,3⟧ we get the ϵ/ν-structuration [[],[N],[N,E],[N,N,N]] which shall be set into the matrix. The indication of the localizations of the differences are now hidden but nevertheless realized by the positions of the matrix.

$$\text{mat} = \begin{array}{|c|c|c|}\hline N & - & - \\ \hline N & \boldsymbol{E} & - \\ \hline N & N & N \\ \hline \end{array}.$$

To constitute the palindromy of the ϵ/ν-structuration [[],[N],[N,E],[N,N,N]] we are not offered the simple mechanism of *reversion* as for classical palindromes with $\omega = \omega^{\text{T}}$for words ω and reversion T.

A reversion of the simplified ε/ν-structuration violates the symmetry of the palindrome:

[N,N,E,N,N,N] ≠ rev([N,N,E,N,N,N])

while,

- ENstructureEN (rev[1,2,2,3]) = ENstructureEN[1,2,2,3];
val it = true : bool

Therefore, an adequate mapping has to be found for palindromicity on the

specific level of ε/ν-structuration.

This corresponding mechanism for palindromes is therefore not defined by *symmetry* but by its generalization towards a *bilateral symmetry* (bisymmetry) and demonstrated by the following example. This is achieved by a *transition* from a linear notation of ε/ν-structures to a planar matrix-notation of ε/ν-structures and its palindromes.

Bisymmetry **(J.ACZÉL, ON MEAN VALUES (1948)) :**

Bisymmetry

A function $\mathcal{A} : \mathcal{I}^n \to \mathcal{I}$ is *bisymmetric* if, for any $x_{11}, \ldots, x_{nn} \in \mathcal{I}$:

$$\mathcal{A}\left(\mathcal{A}\left(x_{11}, \ldots, x_{1n}\right), \ldots, \mathcal{A}\left(x_{n1}, \ldots, x_{nn}\right)\right) = \mathcal{A}\left(\mathcal{A}\left(x_{11}, \ldots, x_{n1}\right), \ldots, \mathcal{A}\left(x_{1n}, \ldots, x_{nn}\right)\right).$$

In case n = 3

$$\mathcal{A}\left(\mathcal{A}\left(x_{11}, x_{12}, x_{13}\right), \mathcal{A}\left(x_{21}, x_{22}, x_{23}\right), \mathcal{A}\left(x_{31}, x_{32}, x_{33}\right)\right) = \mathcal{A}\left(\mathcal{A}\left(x_{11}, x_{21}, x_{31}\right), \mathcal{A}\left(x_{12}, x_{22}, x_{32}\right), \mathcal{A}\left(x_{13}, x_{23}, x_{33}\right)\right).$$

3 x3 – matrix **EN – matrix** **ENmatrixEN**

x_{11}	x_{21}	x_{31}
x_{12}	x_{22}	x_{32}
x_{13}	x_{23}	x_{33}

$\Longrightarrow$

N (1, 2)	– (2, 2)	– (3, 2)
N (1, 3)	**E** (2, 3)	– (3, 3)
N (1, 4)	N (2, 4)	N (3, 4)

$\Longrightarrow$

N	–	–
N	***E***	–
N	*N*	*N*

Example

$\text{palin}([\![1,2,2,3]\!]^{EN}) =$

rev – rows

N	*N*	*N*
N	***E***	–
N	–	–

rev – cols

N	–	–
N	***E***	–
N	*N*	*N*

bisymmetry

N	*N*	*N*
–	***E***	*N*
–	–	*N*

rev – cols

–	–	*N*
–	***E***	*N*
N	*N*	*N*

rev – rows

Bisymmetry: $f_{rows}(f_{cols})[MG) = g_{cols}(g_{rows})[MG] \Longrightarrow f = g$.

In more formal terms we get the classical formulation:

"One says that *f commutes* with *g* on $[x_{ij}]$ if $\mathbf{f \circ g([x_{ij}]) = g \circ f([x_{ij}]^T)}$, and that *f* and *g commute* if they commute on all matrices $[x_{ij}] \in X^{m \times n}$.

More explicitly, f and g *commute* on X if

$$f(g(x_{11}, x_{12}, \ldots, x_{1n}),\ g(x_{21}, x_{22}, \ldots, x_{2n}), \ldots,\ g(x_{m1}, x_{m2}, \ldots, x_{mn}) = g(f(x_{11}, x_{21}, \ldots, x_{m1}), f(x_{12}, x_{22}, \ldots, x_{m2}), \ldots, f(x_{1n}, x_{2n}, \ldots, x_{mn})$$

holds for all $x_{ij} \in X$ $(1 \le i \le m, 1 \le j \le n)$.

A *self-commuting* operation is one that commutes with itself."

Visualization

$$\begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix} \xrightarrow{g} \begin{matrix} g(x_{11}, x_{12}, \ldots, x_{1n}) \\ g(x_{21}, x_{22}, \ldots, x_{2n}) \\ \vdots \\ g(x_{m1}, x_{m2}, \ldots, x_{mn}) \end{matrix} \quad \Big\downarrow f$$

$$f \circ g([x_{ij}])$$

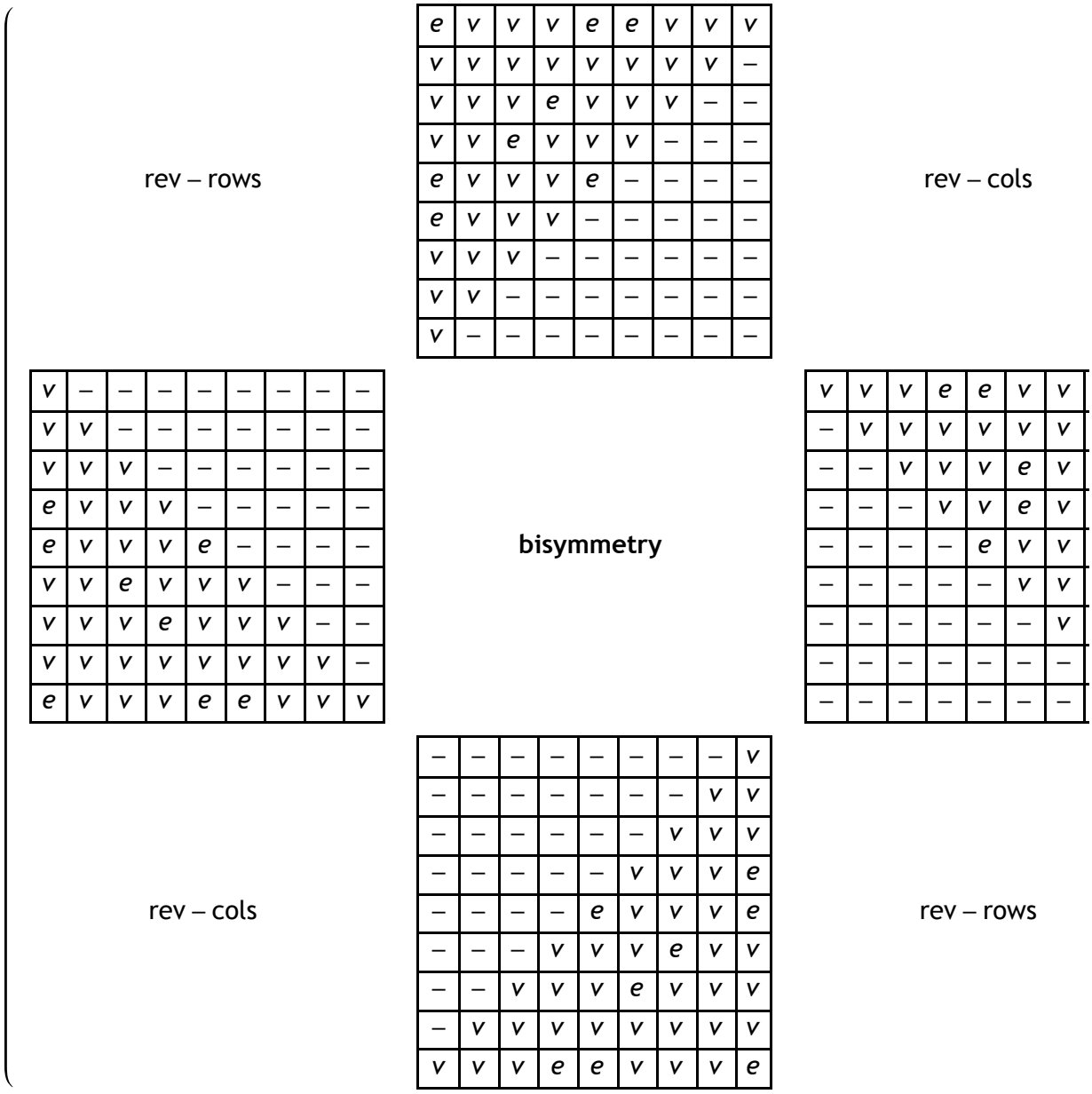
http://www.math.u-szeged.hu/~szendrei/clp.pdf

It is possible that such a constructive 'abstraction' as the mechanism of bisymmetry to constitute palindromicity might be in accordance with Edmund Husserl's attempt to deliberate perception from positivist empirical data by his theory of constitutive/restitutive mental actions.

Example for the morphic palindrome [1,2,3,4,1,1,3,4,5,1]

ENstructureEN[1, 2, 3, 4, 1, 1, 3, 4, 5, 1] =

$_{\text{bisym}}$ rev (ENstructureEN[1, 2, 3, 4, 1, 1, 3, 4, 5, 1])



1.1.11. Ambient sounds based on spatial morphograms

Morphograms as the basic scriptural concepts had been up to now defined as planar morphograms and as planar morphograms disseminated in a contextural grid.

But there are no specifically spatial morphograms defined yet.

With the aim of avoiding arbitrary and inappropriate constructs to morphogrammatics, such attempts to modify the original definitions had been strictly restricted.

With the introduction of the concept of mediated and distributed palindromic fields some more complex formalisms are required to model multi-layered interactional sound fields.

Such multi-layered sound fields might be differentiated by different sources,

each including its own symbolization and notational frame. But nevertheless still able to interact and to constitute a complex multi-layered sound field.

A natural step towards a more complex definition of morphograms is opened up by the construct of '*localization*'. Kenograms, i.e. the ϵ/ν-differences E, N, are distributed over a *planar* space by the position function *pos* with: val it = fn : int -> 'a list -> 'a and the ϵ/ν-structure is defined as: val it = fn : "a list -> (int * int * EN) list list.

Therefore, a very simple change might be introduced with a *spatial* distribution of the ENstructure towards:

ENstructure3;
val it = fn : "a list -> (int * int * int *EN) list list list

Example, homogeneous parallel distribution

- **ENstructure**[1,2,1];
val it = [[],[(1,2,N)],[(1,3,E),(2,3,N)]] : (int * int * EN) list list
triplestructure33:
[[[],[((1,2)1)],[((1,3)1),((2,3)1)]]
[[],[((1,2)2)],[((1,3)2),((2,3)2)]]
[[],[((1,2)3)],[((1,3)3),((2,3)3)]]]

ENstructure3: triplestructure 3 3 ⟶ {E,N}

ENstructure[1,2,1] ∘ ENstructure[1,2,1] ∘ ENstructure[1,2,1] =

ENstructure3 [[1,2,1],[1,2,1][1,2,1]]:
[[[],[((1,2)1)N],[((1,3)1)N,((2,3)1)E]]
[[],[((1,2)2)N],[((1,3)2)N,((2,3)2)E]]
[[],[((1,2)3)N],[((1,3)3)N,((2,3)3)E]]]

Palindrome cluster: $\begin{pmatrix} [N, N, E] \\ [N, N, E] \\ [N, N, E] \end{pmatrix}$

internal palindromes: Systems 1 to 3: [N,N,E], [N,N,E], [N,N,E]
transversal palindromes: between systems 1 and 3: [N,N,N], [N,N,N], {E,E,E]
diagonal palindrome: [N,N,E]

Example, transversal palindrome

[[[],[((1,2)1)N],[((1,3)1)N,((2,3)1)E]]
[[],[((1,2)2)N],[((1,3)2)N,((2,3)2)E]]
[[],[((1,2)3)E],[((1,3)3)E,((2,3)3)E]]]

internal palindromes: Systems 1 to 3: [N,N,E], [N,N,E], [E,E,E]
transversal palindromes: between systems 1 and 3: [N,N,E], [N,N,E], [E,E,E]
diagonal palindrome: [N,N,E]

Palindrome cluster :

$$\begin{pmatrix} [N, N, E] \\ [N, N, E] \\ [E, E, E] \end{pmatrix} = \begin{bmatrix} [N, N, E] \circ [N, N, E] \circ [E, E, E] \\ \begin{pmatrix} N \\ N \\ E \end{pmatrix} \amalg \begin{pmatrix} N \\ N \\ E \end{pmatrix} \amalg \begin{pmatrix} E \\ E \\ E \end{pmatrix} \end{bmatrix}$$

Applications of tabular methods to logics

http://memristors.memristics.com/Notes%20on%20Polycontextural%20Logics/Notes%20on%20Polycontextural%20Logics.html

1.1.12. Education and training for anti-palindromes

Consequences for educational training of 'perception' and 'perceptive cognition' or 'cognitive perception'.

The idea and proposal for a training for the strategy of bisymmetry and morphic palindromes is not specially strange or new.

Perception always was confronted with non-perceivable properties of perception.

Standard examples in the visual domain are symmetries, stable and unstable Janus-faced pictures, drawings or sculptures, also picture puzzles, and so on.

All those properties, duality, illusions/allusions and other puzzles are not given to the perception as such but are, in nature, reflections on perceptions and not perceptions *per se*. And are therefore demanding a new training for post-perceptive experiences.

This analysis presented here goes back to my project *"Kalkül und Kreativität"* I organized at the German institutions around the year 2000: *"Academy of Media Art"* (Cologne)and *"Academy of Fine Arts"* (Frankfurt a. M). But it felt on deaf ears (and bllnd eyes). It got some recognization at the ZKM, Karlsruhe by Marc Jongen Karlsruhe more than ten years later (Hyperimagery 2008).

R. Kaehr, Miniaturen. Studien zu Kalkül und Kreativität 1998-2002
http://works.bepress.com/thinkartlab/7/
And: http://www.thinkartlab.com/pkl/media/SKIZZE-0.9.5-medium.pdf
(both in German).

Compare and contrast:

> "In the same way, the most advanced mode of thinking today must as it were make use of image-giving techniques, in order to illuminate the landscapes of ideas, discourse and data through which it navigates with a new kind of conscious formal seeing."
>
> http://www.humanamente.eu/PDF/Issue_18_Paper_Jongen.pdf

For Douglas Hofstadter: Gödel, Escher Bach
Watch: http://www.youtube.com/watch?v=5jFhq3Rj6DI

Certainly, such considerations about bisymmetry and palindromes are applicable to other genres too. An analysis of dance movements could be of importance. Obviously, performance art, moving images and art in general could apply those insights and methods.

Taxonomic ladder

If someone is in the state of *"trance sans dance"* and is loosing orientation he/she/it is always possible to step down the ladder of the hierarchy of abstractions and subversions to the secure bottom of the Matter-o-Fakten (Husserl), i.e. the 'matter of facts' (Hume) or today, to the facts that matter.

Levels

(1,2,2,3): sequence of factual sounds,
[1,2,2,3]: kenogrammatic sequence of possible sounds, like (2,5,5,3), (3,1,1,2), etc.,
ENstructureEN[1,2,2,3]: difference-structure of the kenomic sequence,
Morphic palindrome PAL[[N],[N, E],[N,N,N]] of the difference-structure with

$[[N],[N,E],[N,N,N]] =_{bism} rev([[N],[N,E],[N,N,N]])$.

1.2. Mathematical Theory

1.2.1. Loops as Palindromes

To listen cognitively to the *'same but different'* sound could be based on morphic palindromes and their structures of iterability of the different same.

What is the temporality of morphic palindromes?

The perception of sounds happens in the succession of time-events. But the recognition has not to stop in this linearity.

Morphogrammatics

The opposite trans-classic approach is abstracting from any referentiality to domains of the languages and is considering their morphic constitution and their constitutional transformations only.

Morphogrammatics is not referring to any semantics or other models of reference. Hence, the morphogrammatic approach is neither opting for a meta- nor for a reflectional conceptualization.

What we can study is the self-transformation of morphogrammatics as responses to interactional perturbations. After that, a new attempt to connect this pre-semiotic endeavour might be re-established with contextural and semantic thinking.

A morphogrammatic system as a whole might emanate its complication or get into evolution by changing its complexity to stabilize or harmonize its organization after being involved into perturbations.

Inside a stable morphogrammatic system different forms of self-transformation can be studied.

http://memristors.memristics.com/MorphoReflection/Morphogrammatics%20of%20Reflection.html

Classical palindromes are structuring such time-events in a sense that the 'forward' proceeding equals the elements of the 'backward' perception. But both proceedings happens step-by-step in time. The comparison of both movements depends on the elements involved. If they are identically the same, forwards as well as backwards, then the event is palindromic in the classical sense.

Morphic palindromes are not depending on elements but on differences. The elements may be different or not, what counts for a structuration of events to be palindromic in a morphogrammatic sense are the differences. Hence a step-wise comparison of the elements as it happens for classical palindromes is obsolete.

Morphic palindromes are not time-related events but patterns with complex simultaneous time-structures.

Hence, a loop to not to annoy by repetivity has to appear and re-appear as the *'same same but different'* (U. Klein).

A creative strategy to avoid ennui, a loop shall function heterarchically as a loop of a loop. Single loops are reductions of the genuine field of loops of loops of a sonic event.

Diamond category of loops

What the intrinsic environment of loops?
Because a loop might be considered as a composition of a forwards and a backwards movement it seems to be natural to thematize just the operation of composition instead of the morphisms that contains the 'material' of the loop and the palindrome too.

> Carsten Dahl: *"When you strike a tone, it is surrounded by something. An initiative. And a silence. By space. What ignites the tone is important: The silence surrounding the actual action."* (Carsten Dahl interviewed by Peter Nicolai Christensen in the Danish newspaper Politiken January 15, 2012).
>
> http://www.academia.edu/2406089/Music_Phenomenology_A_Tool_for_Describing_the_Listening_Experience_based_on_the_applied_phenomenology_of_Thomas_Clifton_Lawrence_Ferrara_and_Don_Ihde
>
> Clifton: *"music is an ordered arrangement of sounds and silences whose meaning is presentative rather than denotative"*

Diamond composition

loop = forwards ∘ backwards, i.e.
loop: morph(a ⟶ b) ∘ morph(b ⟶ a).

There is a nice diamond diagram that depicts properly the whole situation of the composition of two morphisms while reflecting and interpreting its *internal* and its *external* environments, $\mathrm{inv}_{\mathrm{ext}}$ and $\mathrm{env}_{\mathrm{int}}$, of its diamond.

What's not yet involved in this construction of a simple category-theoretical composition of categories and saltatories are the operations of *saltitions* (jumpoids) between saltatories in a diamond of order 4.

Diamond System Scheme

$$\left(\begin{array}{ccc} & \omega_4 \overset{l}{\leftarrow} \alpha_4 & \\ & \updownarrow \quad \updownarrow & \\ \alpha_1 \underset{f}{\rightarrow} \omega_1 \; o \; \alpha_2 \underset{g}{\rightarrow} \omega_2 & & \\ \backslash & & / \\ & \alpha_3 \quad \underset{\mathrm{fg}}{\rightarrow} \quad \omega_3 & \end{array} \right) \Longrightarrow \left(\begin{array}{c} \mathrm{env}_{\mathrm{ext}} \\ \mathrm{II} \\ \mathrm{kernel} \\ \mathrm{II} \\ \mathrm{env}_{\mathrm{int}} \end{array} \right)$$

with MC :

$$\begin{array}{l} \alpha_1 \equiv \alpha_3, \\ \alpha_2 \equiv \alpha_4, \\ \omega_1 \equiv \omega_4, \\ \omega_2 \equiv \omega_3. \end{array}$$

What does it mean in the case of '*perception and conception*' of sounds of a loop system?

Phenomenology of perception always insisted on the importance of the environment in the process of perception. There is no perceivable object without a background perception of its environment.

Even more fundamental: A perception is the result of an interplay of protention and retention.

> "*Husserl describes the consciousness of the just-past as* retention *and the consciousness of the upcoming future as* protention.

> *The field of presence is a continuum which is constantly modified, as each "now" is changed into a past* (Husserl 1964:49-50, 62, 76-79)"

In other words, the "*now*" has two environments, the *retentional* and the *protentional*. The succession of "*now*" is interwoven into the complementary interplay of both aspects of movement: the retentional and the protentional.

A radical mathematical interpretation of this complementary interplay of intentionality is proposed as the interplay of *categorial* and *saltatorial* aspects of diamonds.

A diamond composition $\diamond$ of *f* and *g* then is: $(f \diamond g) = (f \circ g)\mathbf{|}\, l$

The composition *(fg)* realizes the internal environment of the composed morphisms *f* and *g*. While the hetero-morphism *l* represents the saltition of *(fg)*, i.e. the neither-nor of the composition *(fg),* and therefore the *external* environment of the diamond composition. This external environment is intrinsic to the diamond composition and is not related to any informational interaction with a external system as a 'physical' environment.

Unfortunately, there is no strict classical formalism that is contemplating or even realizing this fundamental insight into the process of perception, cognition and cognitive apperception.

Logical analysis allows only to focus on one side of the membrane, the inside or the outside. But is not able to accept the simultaneity and equivalence of both sides, system and environment, at once.

Sonic events are interwoven with other sonic events. Each event is, at least, characterized by itself and its environment.

A formal diamond analysis is not concerned with the empirical multitude of events, sonic and others, but with the structural mechanism of the phenomenological insight into the simultaneity of both, the *composition* of morphisms and their genuine environments.

An approach to go into this deep-structure of simultaneity and complementarity of cognition and perception in general is proposed by the anti-concept of a *diamond*-interplay of categories and saltatories.

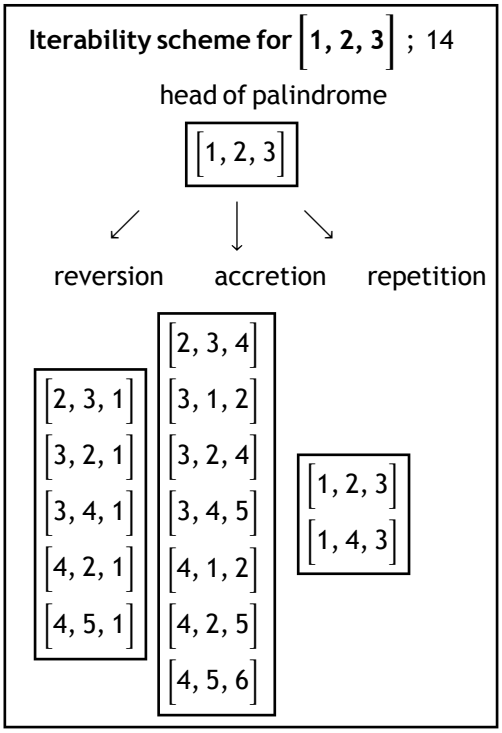
Hence, what has to be established for a more complete theory of morphic palindromes is its embedment into the interplay of categories and saltatories in the framework of a polycontextural diamond category theory.

Rudolf Kaehr. Diamond Theory Collections. A collection of papers and fragments towards diamond theory 2007-2009.
Available at: http://works.bepress.com/thinkartlab/9

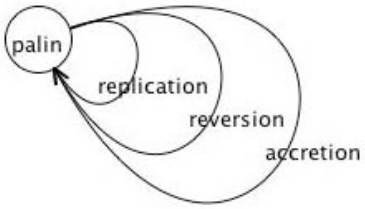
1.2.2. Mixtures as palindromic fields

> "A fairly minimal system-based thing created from a set of related loops that shift over and around each other."(Shaun Bailey)
> http://www.artistserver.com/iridium

What are palindromic fields?
Palindromic fields are shifting over different but same palindromic cycles. Those cycles are not conceived as a set of isolated events but as interactional mediations of the 'same but different' thematic cycles.



Palindromic field



With each return, the head is differenciated because it is what it is by its involvement, and not by a role-independent abstract identification. The "same same" is different with each return. The differences of the returns might be classified by a category of internal differences and by differences between the categories.

But this is not the eternal return of the same as different or equal but also the source of developments.

Each palindrome of a palindromic field is different. But each return part of a palindrome, its body, is morphogrammatically equivalent to the common head if it is of the same length as the head. In this case both the head as well the bodies are of the same length and are palindromes.

Example of a differences of two palindromes in the field:

- ENstructure[1,2,3,1,2,3] = ENstructure[1,2,3,2,3,1];
val it = false : bool

Examples of the sameness of head and return parts:

- (ENstructure[1,2,3] = ENstructure[4,2,1]) = (ENstructure[2,3,1] = ENstructure[1,4,3]);
val it = true : bool

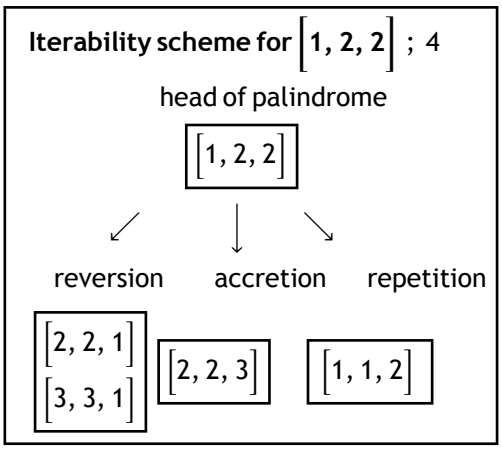
The example shows the palindromic field of the head [1,2,3]. This head itself

is located in the system of morphograms of the length 3 calculated by:

- Tcontexture 3;
val it = [[1,1,1],[1,1,2],[1,2,1],[1,2,2],[1,2,3]] : int list list

Obviously, the head [1,2,3] has the highest differentiation for morphograms of length 3.

All other morphograms might play the role as a head of a palindromic field.

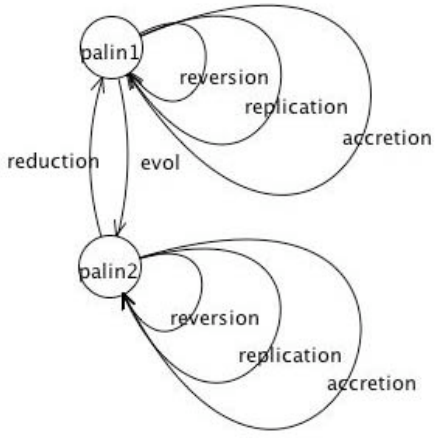


The palindromic field of the head [1,2,2] contains 2 reversions, 1 accretion and 1 repetition. Neither the head nor the bodies are palindromes as standalone morphograms.

Hence, the head [1,2,2] enables 4 palindromes:
[1,2,2,2,2,1], [1,2,2,3,3,1], [1,2,2,2,2,3], [1,2,2,1,1,2].

Those 4 bodies: [2,2,1], [3,3,1], [2,2,3], [1,1,2] are defining the head [1,2,2] 4 times differently as the same, namely [1,2,2].

Palindromic distribution



Next to the '*emanative*' developments, the head might be prolongated accretively by augmenting its complexity from 3 to 4:

- Tcontexture 4;
val it =
[[1,1,1,1],[1,1,2,2],[1,2,1,2],[1,2,2,1],[1,1,1,2],[1,1,2,1],[1,2,1,1],
[1,2,2,2],[1,1,2,3],[1,2,1,3],[1,2,3,1],[1,2,2,3],[1,2,3,2],[1,2,3,3],[1,2,3,4]] : int list list

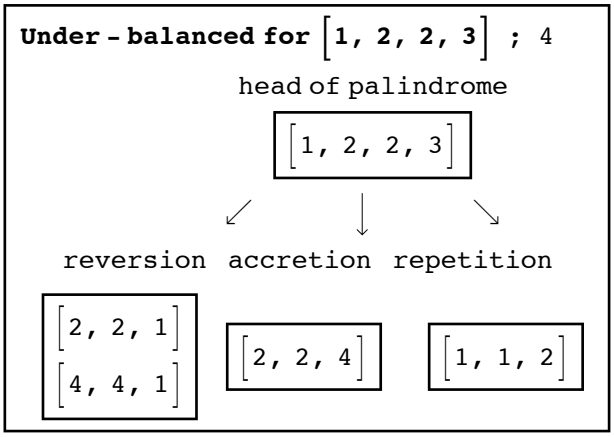
Certainly, a reduction of the complexity of the palindromic heads is possible

too.

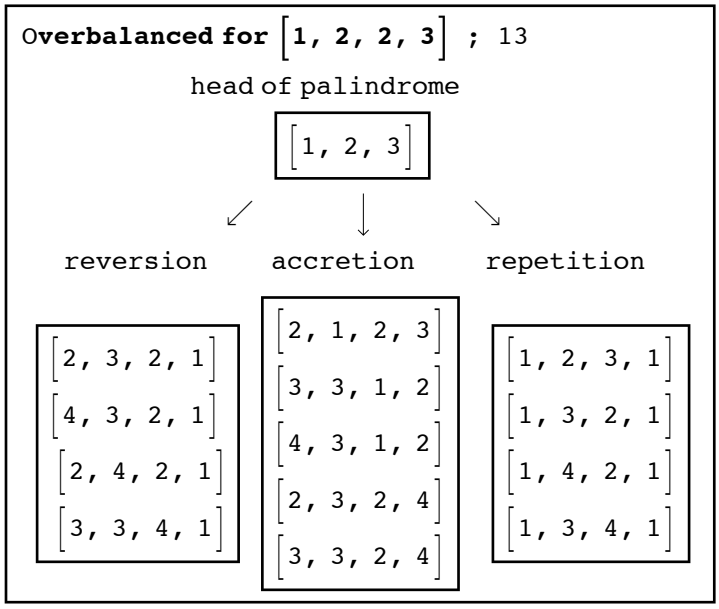
1.2.3. Balanced, under- and over-balanced palindromic fields

It might be said, that a proper palindrome is a balanced palindrome. That is, the head and the body are of equal length.

Under-balanced palindromes occur if the length of the body is smaller than its head.



Naturally, there are overbalanced palindromes too. Here, the body is longer than the head.



Equally, there are also mixed types of palindromes in a palindromic fields possible.

1.3. Technical solutions

1.3.1. Memristive devices

Micro-electronics is *per se* not able to realize the iterability of the ‘same’ as difference.

A ‘flip-flop’ is condemned to repeat itself eternally without any recurs to the history of its past states.

A solution might be found in the realization of memristive devices, based probably on different kinds of memristor compositions.

The ‘same-as-different’ has to be Janus-faced. It loops simultaneously forwards and backwards at once.

Each move forwards is mediated with the *history* of its steps backwards. Mediation is not producing restriction of chances for further prolongations but is opening up reasonable possibilities of continuations.

A technology that takes the history of its actual actions into account is proclaimed by the nanotechnologic developments of memristive systems and devices.

Memristics: Memristors, Again?
http://works.bepress.com/thinkartlab/37/

Memristics: Memory is more than Storage, Memristive memory is able to surpass the conceptual limits of computational storage methods
http://memristors.memristics.com/Memory/Memory%20is%20more%20than%20Storage.pdf

2. What’s on the horizon?

A new epoch of music ‘production’, ‘realization’ as interaction demands for new technologies connected with a new understanding of iterability (repetition, recursion, reflection).

> "A mechanism for the initiation of genetic recombination is proposed. Its key features are the pairing, nicking, and cross-annealing of palindromic loops, i.e., structures formed by DNA with sequences of inverted complementary repeats. This mechanism may provide a simple, yet specific means of producing crossed strand connections between homologous DNA duplexes to form structures which can be intermediates in the process of genetic recombination."
> Wagner, Robert E.; Radman, Miroslav, A Mechanism for Initiation of Genetic Recombination (1975)
> http://adsabs.harvard.edu/abs/1975PNAS...72.3619W

> "Loosely based on the "phase canon" process originated by Steve Reich in his 1965 tape composition, *"It's Gonna Rain"*, this piece consists of several palindromic loops of found material, two at the exact same pitch but 180 degrees out of sync with each other for the duration of the piece, providing a constant wash of sound which seems to be simultaneously coming and going, then several other identical loops played at lower, complimentary pitches, drifting in and out of sync with everything else."
> http://forums.unfiction.com/forums/viewtopic.php?p=36710
>
> https://docs.google.com/document/d/12-MHsAJp6RDBmrBdNrglZc8jVK-CYRJqjf_MzDTviXTE/edit
>
> "This analysis also explains why Reich often utilizes palindromes as the main framework for formal structuring in many of his works. In essence, the phasing process is a palindrome, in it of itself."

http://en.wikipedia.org/wiki/Frippertronics

http://en.wikipedia.org/wiki/Soundscapes_by_Robert_Fripp#Technology

2.0.1. DNA music - the iteration of the same

THE HUMAN GENOME MUSIC PROJECT

http://www.yourdnasong.com/index.html

"Music in its simplest form, as we know it, could be termed as 'The organisation of sound into a definable audible expression' and DNA employs this very principal to operate its complex and delicate genetic function.

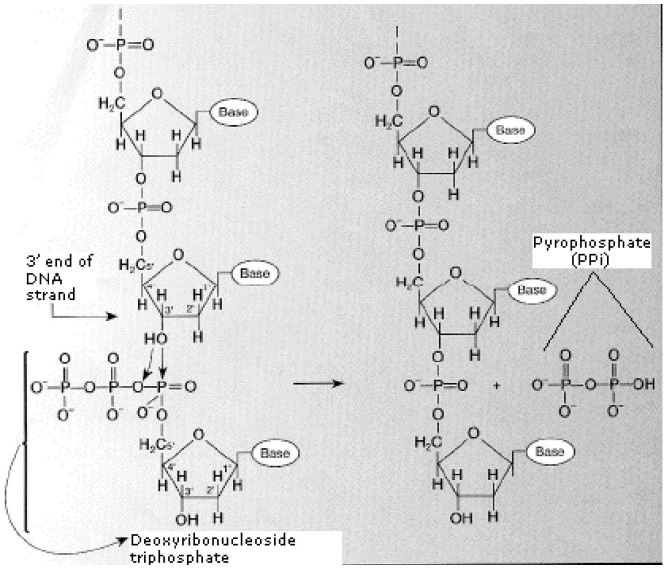
"Dr Ohno's wrote about authentically connecting the DNA code to musical composition.

'… the principle of repetitious recurrence pervades both the construction of coding sequences in the genome, which can be regarded as being representative of nature and musical composition which can then be regarded as the most abstract and therefore the most intellectual expression of nature.'"

http://www.tokenrock.com/dna_music/dna_into_music.php

Situations where the same in different contexts is equal.

"When the process is complete, two DNA molecules have been formed identical to each other and to the parent molecule."



http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/D/DNAReplication.html#replication_origin

Despite the complexity of DNA research concerning palindromes, the leading model for DNA palindromy is surprisingly simple.

"A palindromic sequence is a nucleic acid sequence (DNA or RNA) that is the same whether read 5' (five-prime) to 3' (three prime) on one strand or 5' to 3' on the complementary strand with which it forms a double helix." (WiKi)

Symmetry and palindromy as properties of nature

"Symmetry of shapes is something that is found everywhere in nature.

Human beings have always been attracted to symmetrical properties of natural phenomena, and their interest is reflected in art.

"With the progress of molecular biology in the 20th century, a new level of symmetry was discovered in nature. From the study of restriction endonucleases in the 60's and the early 70's, it became clear that a certain type of palindrome, i.e. *reverse palindrome*, occur in DNA sequences. Restriction enzymes recognition sites which exist in double-stranded and not single stranded DNA, are usually "palindromic".

For example:

G A A T T C

C T T A A G

is an example of a palindromic sequence recognized by restriction enzyme EcoRI.

http://www.biomedcentral.com/1471-2105/9/274