

Repetition and loops in music...and beyond

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In our talk at the summer school “Cinema and contemporary art 3” we presented how repetition and loops as music techniques and as music technologies are shaping music. This essay grounds on the results of the lecture and the discussion afterwards. Therefore we are going to summarize the most important aspects we were talking about to formulate several theses based on Diedrich Diederichsen`s theses on loop as a part of our lifesⁱ. We want to combine our results from the lecture with Diederichsen`s thoughts and exemplary illustrate them on the films *Groundhog Day* (1993) and *Shining* (1980).

Techniques

Repetition is the most basic principle in music. Be it the repetition of equal notes in a motif, the repetition of a motif, the repetition of a movement or formal parts or repetition as a constitutive principle. In first instance the realisation of such techniques occurred as a musical performance practice, which changed in the course of time by the emergence of machines like the Orchestrion, tape recorder or sequencer. Nevertheless without repetition a huge amount of our music would not exist.

As a music-aesthetical ancestor of loops the ostinato must be mentioned, though in this case it is a music technique. Like the Latin name suggest the term ostinato stands for “obstinate” as well as “recurrent” whereby the characteristics of an ostinato have been more or less described. Ostinato characterises on the one hand uniformly designed counterpoint voices, on the other hand a consistent tone sequence thoroughly in a changing rhythmical arrangement. Formation by continual repeating can be ascertained in music in various ways. The use of an ostinato can be constitutive for a whole piece like with Ravels Bolero (1928)ⁱⁱ. Therefore the ostinato can be seen as a pre-existing loop technique.

Technologies: tape, sequencer, audio software

The term “loop” describes in music three practices, which are realised by technology.

- Therefore loop stands first for the repeated „readout of a data field between defined starting and ending points“ⁱⁱⁱ within digital music equipment.
- In matters of the practice of sampling the term “loop” can describe secondly the stretching of a sound by repeating a short sample of a wave.
- The third possibility deals with the technique of sampling of a pre-existing record in order to loop this sample as a pattern^{iv}.

A huge amount of contemporary audio software grounds on this principle of sequencing, therefore sampling is not a compelling condition for the creation of a loop. One can as well arrange self created material as a loop. We will now focus on tape recorders and tape music as they were the first outcomes of loop based music.

The first tape recorder *Magnetophon K1* was invented in 1933 by Eduard Schüller and finally presented in 1935 by the company AEG. In 1948 Ampex created the first tape recorder *Ampex 200* for music production. For normal playback the tape is played forward for one time from the left to the right reel^v. A more sophisticated usage of tape recorder is the influence of the playback speed and the direction of the playback, i.e. double speed leads to an octave up while a quarter less of speed leads to a fifth down. A simple loop is established if you connect

the tape as a simple circle and adjust it around the reels. Playing back the tape now will repeat the recorded material. Through the technology of the tape recorder the repetition became technologised which resulted in different aesthetic directions in France, Germany and USA and they became more and more important for the realisation and persistence of music.

In France Pierre Schaeffer had used locked grooves, before he started using tapes. Schaeffer founded the *musique concrète* as a base for autonomic electro acoustic music. The term *musique concrète* is related to the used sound-material which was 'concrete', meaning it was recorded by a microphone, before starting the realisation of the composition. The main attitude of Schaeffer was to invoke a new perception of sound which caused a new definition of music detached from typical parameters like harmony, melody and rhythm. By repeating recorded sounds he confronted the listener with daily noises which are reconceptualised into a musical environment. One of the basic ideas of *musique concrète* is to use sound-snippets to collage a final sound which sounds like a natural or daily sound. To achieve a final sound Schaeffer was not only using one sound, but layered a lot of single sounds. The pure source of the original sound was covered and therefore disconnected from its original semantics.

Karlheinz Stockhausen used loops in his piece *Kontakte* (1958) to generate new sounds and impulses. His focus was the establishment of new electronic sounds by using tape and their playback possibilities. Playing back a loop with a high frequency creates new controllable sounds. In contrast a very low playback frequency may result in new impulses with interesting spectres. In detail it means: Hz is calculated as wave length by sec. A sine of 440 Hz which is an 'a' note that frequents 440 times a second. If you use a one second piece of tape you can play it back with a frequency of 440 and you will hear a note of 'a' but with another spectre – not as clear as the sine wave. On one side composers start to use the status quo of physics and mechanics of machines to produce new sounds or discover acoustic phenomena. On the other side even composers became technicians and start to invent new machines or strategies like Stockhausen to enrich their sound library.

In the 1960s American composers like Terry Riley and Steve Reich spotlighted on repetition in their musical work on the basis of their experiences with tape loops. The pieces *It's gonna rain* (1965) or *Piano Phase* (1967) of Steve Reich present themselves as a gradual process, while Terry Riley's *In C* (1964) consists of 53 patterns which must be played one after another. There is no information concerning the instrumentation, the number of repetitions and entrance of voices therefore leads to a permanently changing wall-of-sound.

It's gonna rain from Steve Reich is a tape composition, which constitutes on asynchronous running tape recorders. For the realisation of the piece Reich used first a longer sample out of a speech of Brother Walter. Subsequent to this he starts two tape recorders in sync containing two identical, repeating tapes with the sample "It's gonna rain" to initiate a musical process.

The effect of an asynchronous run, which establishes itself even under the best technological conditions leads to an overhauling process that is called "phase shifting" or "process of gradual shifting relations" by Reich^{vi}. From a basically simple musical and technical instruction results an aesthetic experience with unexpected ranges of rhythmic and timbral changes, which in turn are hardly predictable just like *In C*.

What unites both pieces of Riley and Reich besides their different musical approaches is the fact that they reached their new aesthetic only by technology on the basis of minimal motif material which generates by repetition a maximum amount of individual sound phenomena.

In this case the source was disconnected while the process of hearing the repetition. It is not only a technical move but also based on the perception of the listener.

So far it came out that repetition is one of the prior principles in music. Driven by the development of technologies in music the ranges of possibilities for the design of repetitions were extended.

Still relying on tape technology, but using it in a different way the Mellotron is a pre-stage of a sampler and uses tape-snippets as playback devices. It looks like a keyboard and each key triggers a miniature of a tape recorder. The Mellotron shows a very simple feature of a sample: it is a limited extraction of a sound persisted to tape. A sample of a drum computer and therefore sequencer is nothing else but mapped into the digital world. The sample itself does not make it a loop, but a sequence of a rhythm does. Based on the tempo the sequencer triggers 16 keys in a row which makes it automatically a 4/4 metric. The trigger starts the playback of the activated keys and generates the sound like snare, bass, bell etc.

Actually in 1985 a variation of House music originated in Chicago which owes its existence solely to a certain sequencer instrument, the *Roland TBR 303*^{vii}.

The Japanese electronics company Roland released the TBR-303 in 1981, the production run, however, only for two years. The reason for this failure was the synthetic sound of the TBR 303, which was meant for guitarists to accompany themselves.

In a different audience, this sequencer enjoyed an extreme popularity. In 1985 DJ Pierre and Spanky modulated on the basis of a 15 minutes long rhythm track a bass line with all the possibilities of sound variation the TB-303 offers. This piece which was later called “Acid Tracks” and marks the starting point for a whole subgenre: Acid House.

Especially from the 1990s on since the personal computer was available for consumers the development of sampling based sequencer software was speeded up. Recent audio-software has a lot of tools integrated to make the production faster. With easy access tools provide a generous altering of sound and therefore the loop. As we formulated it creating music by audio software is like playing with LEGO, in which different sound units are designed as patterns, bass lines or melodies and put together in the arrangement. Somehow in this way of music production loops are an inherent part because of the design, structure and usability of such programmes.

Fig1: Screenshot of a sequencer software arrangement including repeated sound units^{viii}

So far we have moved in the past, however, repetition and loops play an important role in contemporary popular music. For the genres of electronic dance music, they are even constitutive. During the development of electronic dance music several principles have developed in dealing with repetition. The structural principle of the song was broken open which was still very present in the early days of Disco and House and put in place the constant repetition and layering of patterns instead of the repetition of form parts. The pieces in electronic dance music are therefore called “tracks”. Tracks consist of micro loops which is each voice arranged as a loop that form a meso loop – the bar – and finally design a macro loop composed of multiple bars in which the micro and meso structures stay stable.

Sequences of micro, meso and macro loops establish the track.

The aesthetic aim of tracks is to keep people dancing. They dictate the basic pulse by the kick drum on which the patterns are layered and piled up until a continuous flow is established. This is usually the case when the *constitutive beats*, bass line and patterns sound together^{ix}.

The fewer elements the more tension is created. The function of the kick drum as a cohesive element can be identified in breakdowns, where it is in fact taken away to generate strain among the dancers, which discharges when the kick drum returns.

However, loops are not alone a subject to music, but can be found in other forms of cultural production. This is most obviously the case concerning VJing, which forms a visual counterpart to electronic dance music. In VJing visual loops are layered and exchanged one after another. As with the audio software, the programs provide a framework for VJs to fill it with their own material. VJ programs work therefore as a visual sequencer. Although VJing has spread in a wide aesthetic spectrum, the club VJing has above all a supportive function for the atmosphere production in club cultures^x.

Living in loop

In *Eigenblutdoping* (2008) Dierich Diederichsen^{xi} concentrates on the motivation and stylisation of an increased self identity. In the chapter “Leben im Loop” (living in loop) he identifies that the loop has become the *central formal model of cultural production*^{xii} as well as defining the loop as life or path of life. The opposite of the loop is advancement which Diederichsen calls the main motto for western post-war Germany – we think this is also true for other countries – with its promise of social advancement and the Fordist compromise of permeable social hierarchies. Contemporary research shows that Fordism is actually the exception and precarity the norm^{xiii}. At least Fordism and Taylorism have achieved that our working patterns are embedded in loop structures; be it the repetition of gestures during work or division of labour. Therefore the promise of social advancement as a way of individuation or stylising the self identity and as an aim of the life path appears as a myth.

On the other hand there is the loop which Diederichsen calls “an everlasting promissory departure which does not claim, however to lead to a concrete utopos”^{xiv}. Advancement was a main topic in the literature of *Sturm und Drang*, where the protagonist leaves the family and the patriarchal father to go on a long journey, but nevertheless returns to replace the father and consequently become the patriarch. The loop instead constitutes a circle with the aim of being a distinctive ego without becoming a patriarch^{xv}.

“The bare repetition of the loop is just not the disappointing process, because of its return to its own beginning. It is the same, hence, a possibility to observe the change of my experienced subjectivity to have a second order experience of change which does not limit itself to the linearity of life path and growth.”^{xvi}

In Diederichsen’s thinking the loop is triggered by the motivation to develop a distinctive ego, to experience your own micro changes in a stable environment and therefore become someone else^{xvii}. Hence the loop can be viewed as a either good or bad technique of individuation.

“The loop could become such a successful trope of speech thus of description and of narration, but furthermore also of the organisation of experiences, because of the fact that the loop embeds different possibilities between regression and self reflexivity without being arbitrary.”^{xviii}

In our presentation we used the program Max/Msp to show the read out of a data field with changing starting and ending points. In this explanation the loops moved through the data field and therefore adjust the content of the loop. The data field was a digital video clip of the Russian baritone Eduard Khil, better known as the You-Tube phenomenon *Trololo*^{xix}.

We presented the possibility for triggering and moving the sample of the loop by a defined algorithm as well as by triggering it through music with the result of various different loops based on the same data field. The video clip as the environment stays stable while the loop is permanently repositioned and therefore continuously changes. With Diederichsen in mind this

leads to the questions: What triggers your loop? What makes the sample of your loop change?

In *Groundhog Day* (1993) Bill Murray is condemned to live through the same day over and over again, which is his hated annual engagement of presenting the Groundhog Day festivities. First he tries to get benefits from this situation so he is triggered by negative hedonism, but as this happens to be dissatisfying he kills himself in various ways, nevertheless wakes up again with Sonny and Cher on the radio.

Therefore a meso loop – the Groundhog Day – can be identified that is embedded in a macro loop which is the time in between the annual celebration of Punxsutawney Phil. The Groundhog Day is the starting point of the macro loop and each action in the meso loop is a micro loop. Finally something happens which makes Murray change. His trials to seduce Andie MacDowell fail until he honestly falls in love with her. He recognizes the micro loops and the possibility to design them and the meso loop by micro changes. By these micro changes his personality changes he becomes someone else too. The amount of micro changes enables him to win Andie MacDowell's heart and consequently to step out off the meso loop to enter the macro loop again as a different person.

The self reflexivity Bill Murray's allowed the changes within himself to happen and therefore influence the environment through these changes.

Differently in *Shining* (1980) two types of loops can be identified in the scene where Shelley Duvall discovers the manuscript of the book Jack Nicholson is working on. First, we have a loop in the sentence "All work and no play makes Jack a dull boy", which we identify as a motif. While there are variations in the layout the motif material remains the same. In addition, the second loop is presented as a compulsive act and as a condition, Jack Nicholson can not escape and which ultimately leads to madness. No awareness of the loop triggered by delusion proceeded and therefore the loop can be identified as a regressive pathological act.

In our presentation we were showing pieces which contain the same loop and how an identical loop can result in different aesthetical outcomes.

In Andreas Dorau's *Girls in love* (1996) the loop establishes a certain flow of music, while in the Grungerman remix (1997) the disruption between the loop and the other voices is the main aesthetic mean, which creates by disruption strain that is released at the time the loop disappears. Strain as an aesthetical-physiological mean in electronic dance music always comes along with relief. Outside of the realms of music and art strain as i.e. catatonia becomes problematic if it is not relieved or because of lacking reflexivity the source of the strain or the trigger of the loop stays undetected. In Psychoanalysis regression describes a common act^{xx} as well as a pathological condition.

Again, what triggers your loop?

Actually our lives are based on several loops regarding work, leisure, mind, body and environment, which are triggered by specific motivations and circumstances.

Focussing on the loop based structures of work and leisure one can suggest that money is the biggest motivation of all, but it is actually triggered by the *spirit of capitalism*^{xxi} in which work itself is the highest duty. But even our leisure time is scheduled like a work day and the improvement of oneself also became a duty^{xxii}. Besides the pressure which is inherent in such concepts, they are even more problematic if someone is unable to participate in them because of unemployment. Instead of the work loop different compensatory loops are installed in order of surveillance by employment centres.

Since we don't want to paint a bleak picture there are other possibilities of triggering as for example passion as Pekka Himanen (2001) pointed out for hackers by which he also describes

people like musicians, artists or honorary workers^{xxiii}. In this sense work is no duty, but the satisfaction of interest that is shared in a community or peer group and appreciated by reputation. Money is not constitutive and the working loops produce pleasure because of its imbedding in a certain environment.

As we have shown the sample of the loop can change by movement even in the sense of advancement just without a tangible aim and reach a certain point where the sample consists of completely new events while the environment stays stable. As a musical analogy it is the case in *The Loop* (2010) by Nina Kraviz. The track consists of a vocal sample "I'm spinning around baby" that is arranged as a loop. At 3'18" another loop is introduced which replaces the former loop while the other voices remain the same.

In the Michael Mayer & Tobias Thomas mix of *Maps* (2005) by Ada the "Girls in love"-loop is also used and appears at 4'14". Hence it functions as reminiscence and shows another possibility in the relation of loop and environment. As reminiscence the temporary return of an old loop can be identified as a conscious decision of experiencing a remembrance, but also to observe the changes of the self identity. Nevertheless a conscious decision calls for knowledge. The knowledge of the imbedding of oneself in loops enables self reflexivity. Therefore the disentanglement of the myth of advancement as an aim of individuation can lead to a reflection on loops as means of individuation. By the knowledge of the repetition the micro structures of the loop as well as the difference of it become apparent. One realizes his own subjective changes.

„Don't we know at least by minimalism and Techno that it is not always the same we hear in a loop? By its flexible constancy our own micro changes suddenly become big; the world around the loop grows"^{xxiv}

As mentioned above a Techno tracks consists of multiple layers of micro loops which design the piece, same is true for pieces like *In C* or *It's gonna rain*. If someone is willing to engage in repetitive music this might lead to hardly predictable individual experiences concerning the complexity and segmentation of loops.

Just as granular synthesis deals with the miniaturisation of loops the examination of the loop as a technique of either *poisonous* or *therapeutic individuation*^{xxv} or as a way to think common life has to concentrate on the micro structures and the embedding of loops as well as the continuum they create. On the contrary if someone just focuses on the whole piece the micro elements and micro changes will stay undetected. Concentration on the overall structure blocks the view on the true nature and could therefore lead to strain or apathy. As long as someone is following the myth of advancement he/ she will not come to know the richness of new experiences of loops and therefore the possibility of changing the sample of the loop as advancement.

Musical phenomena, hence, can work as an analogy in analysing the principles of repetition in our contemporary life. Repetition and loops can establish a flow or disruption in regards to the overall structure. This depends on the knowledge of loops and as a conscious decision this can lead to several experiences like reminiscence which work as a part of individuation. Loops can create an auditory continuum - as a sound - as well as an arranged continuum - as a sample - and they are embedded into a meso and macro structure. The creation of a continuum is the main function of a loop, but its design presents itself in varying forms just like phase shifting or creating sounds with divergent spectres. Through the continuum the original motif loses its former meaning, but creates within hardly predictable individual experiences for the willing recipient or might as well lead to regressive acts, which depends on the nature of the

trigger and knowledge. Maybe the fact that loops have become a central model of cultural production is a sign of our time concerning the structuring of work as well as leisure and finally our thinking. We suggest by concentrating on repetition and loops in music that these examination offers instruments for analysis beyond the realm of music.

- ⁱ Diedrich Diederichsen, *Eigenblutdoping: Selbstverwertung, Künstlerromantik, Partizipation*. Verlag Kiepenheuer & Witsch, Köln 2008. pp. 15 -38.
- ⁱⁱ see Michael von Troschke, *Ostinato*, in Ludwig Finscher (ed), *Die Musik in Geschichte und Gegenwart*, Bärenreiter, Kassel 1999, pp. 1235 – 1240.
- ⁱⁱⁱ See; Our translation
- ^{iv} see Peter Wicke, Wieland Ziegenrucker, Kai-Erik Ziegenrucker, *Handbuch der populären Musik. Geschichte – Stile – Praxis – Industrie*. Schott Verlag, Mainz 2007, p. 406. Our translation.
- ^v Ibidem
- ^{vi} see Steve Reich, *Writings on music*, Oxford Press, Oxford 2002.
- ^{vii} The “TB” stands for “transistor bassline” and this is a computer operated analogue bass line synthesizer, equipped with an octave keyboard and six modifiable filters for sound processing.
- ^{viii} Courtesy of Dennis Mathei
- ^{ix} Dennis Mathei, *Techno 2008* (master of arts thesis), Folkwang Universität, Essen 2008 or Dennis Mathei, *Oh my god it's techno music!*. epos Verlag, Osnabrück. In preparation.
- ^x see Susanne Scheel, *Vjing. Musikvisualisierung im 20. Jahrhundert*. VDM Verlag, Saarbrücken, 2009.
- ^{xi} Diedrich Diederichsen is a German pop culture theorist. He was author and editor for Spex. Since 2006 he is professor for theory, praxis and mediation of contemporary art at the Akademie der Bildenden Künste in Vienna.
- ^{xii} Diedrich Diederichsen, *Eigenblutdoping: Selbstverwertung, Künstlerromantik, Partizipation*. Verlag Kiepenheuer & Witsch, Köln 2008, p. 17.
- ^{xiii} Brett Neilson, Ned Rossiter, *Precurity as a Political Concept, or, Fordism as Exception*, in *Theory Culture Society* 2008, Vol. 25, pp. 51 – 72.
- ^{xiv} Diedrich Diederichsen, *Eigenblutdoping: Selbstverwertung, Künstlerromantik, Partizipation*. Verlag Kiepenheuer & Witsch, Köln 2008, p. 33. Our translation.
- ^{xv} Idem, p. 35.
- ^{xvi} Ibidem
- ^{xvii} Ibidem
- ^{xviii} Ibidem. Our translation.
- ^{xix} <http://www.youtube.com/watch?v=xUlW4NT08Ds&feature=related>
- ^{xx} see Reinhart Lempp, *Das Kind im Menschen. Nebenrealitäten und Regression – oder: Warum wir nie erwachsen werden*. Klett-Cotta, Stuttgart 2003.
- ^{xxi} see Max Weber, *Die protestantische Arbeitsethik und der Geist des Kapitalismus*, Weinheim, Beltz Athenäum 2000.
- ^{xxii} see Pekka Himanen, *The Hacker Ethic, A Radical Approach to the Philosophy of Business*. Random House, New York 2001, p. 26ff.
- ^{xxiii} Idem, p. 3ff.
- ^{xxiv} Diedrich Diederichsen, *Eigenblutdoping: Selbstverwertung, Künstlerromantik, Partizipation*. Verlag Kiepenheuer & Witsch, Köln 2008, p. 34. Our translation
- ^{xxv} To cite from Bernard Stieglers talk at the Prometheus 2010 summer academy