

**Game Pieces
and
Game Elements**

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Master's Thesis

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The Hague
May 2017

Acknowledgements

I want to express deep gratitude ...

to Kees Tazelaar and all Sonology teachers and students.

to my mentors Gabriel Paiuk and Richard Barrett for their advice, comments and critique.

to Johan van Kreij for support with programming problems.

to Lex, Marko, Michele and all EWP staff for technical advice and support.

to all composers who shared scores, material and ideas with me in mail correspondence.

to my dear friends who did corrections and gave comments on the thesis.

to Robert Schuttleworth for collaborating with me on the screen score of 3x3.

to all performers who took part in workshop experiments and the first performance.

and finally to the three most important women in my life, Susanne, Julia and Leni, for their moral support and love.

Abstract

This thesis presents the result of the theoretic and artistic investigation of "game pieces" and "game elements" in the performance of music. As proposed, the concept of "game pieces" focuses on game-related activity of performers and is constituted by "game elements", which in different constellations and accentuations enable "gameful" activity. Derived from relevant theories about games, the following "game elements" are identified as central: rules, the player's agency, uncertainty, skills, goals, obstacles, conflict, competition, chance and roles. Under these aspects three examples of works are discussed: *Duet II* (1961) by Christian Wolff; *Cobra* (1984) by John Zorn; and finally my own work *3x3*, which is presented more in detail including a documentation of the compositional process. Furthermore, it is examined how the game aspect relates to the music, and which implications it has for performers and the audience.

Tags: game pieces, games, play, indeterminate music, performer agency, screen score, improvisation

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1. Introduction

The research that preceded this thesis aimed at an exploratory investigation of the intersection of two different types of artefacts and their related practices: games and works of contemporary music, or more specifically of indeterminate or experimental music. My personal motivation arose from a basic assumption that games could provide an interesting framework for the composition and performance of music.

Retrospectively, I believe that the playfulness and fun of games as opposed to "serious music" built a starting point for my involvement with this field. The joy of playing games can possibly also act as motivation for performers and audiences to get involved in game-related performances of music. Another point is that everybody is familiar with the activity of playing games in one way or another. Because playing games is situated in everyday life, as a musical context it is not abstract, theoretical or difficult to understand, but essentially accessible for performers and audience alike. But as many games have simple rules that can lead to complex and unpredictable processes and outcomes, I hope that game-like performance configurations and compositions can similarly create musical complexity and lead to results that subvert musical expectations.

All games fluctuate between freedom and order. Many games set up situations of conflict or cooperation; obedience or subversion. Game-related performance practice allows for a reflection of the social and political implications of games, referring back both to the performance on stage and to the world outside.

The questions that guided my theoretical and artistic research were the following ones: What are central characteristics of games? Which of these have been applied in examples of works that involve or resemble game activity in their performance and in which way have they been realized? What are the implications and consequences for the performers and the audience if a performance involves or resembles game activity? And finally, what is the relation between the game aspect and the resulting music?

This introduction is followed by three main chapters and a final epilogue. The second chapter gives a general overview of the concepts and phenomena of play and games by outlining relevant concepts, classifications and definitions. It demonstrates the diversity of forms and instances of play and games, as well as their diverse interpretations, functions and definitions. Roger Caillois' concepts of *paidia* and *ludus* as basic principles of play and games, and his classification of games into *agôn*, *alea*, *mimicry* and *ilinx* are outlined and provide relevant and useful theoretical tools for a further discussion about game characteristics. Caillois' definition of games is complemented and compared with the definitions by Johan Huizinga, Bernard Suits and Jesper Juul.

The third chapter tries to conceptualize "game pieces" and discusses two selected examples¹, by analysing how their performance relates to game activity. I propose that "game pieces" are characterised by "game elements" and not necessarily by fulfilling game definitions like the ones presented in the second chapter. To further illustrate my approach, I refer to the terms "gamefulness" and "gamification". Next I will relate "game pieces" to indeterminate music and discuss which role of the performer plays in such works. Finally, the examples *Duet II* (1961) by Christian Wolff and *Cobra* (1984) by John Zorn will be described and analysed in regard to their game character.

The fourth and final chapter deals with the practical part of my research, which culminated in the composition of *3x3* for 9 performers using a computer-controlled screen score. After giving a general description of the my concept and the result, I will shortly depict openness and flexibility as personal paradigms of my work, followed by a description of the "playing modes" and central parts of the software, which was realised within *Max/MSP*. Next comes an outline of the compositional process and the first performance, while also mentioning

¹ Other more recent examples for "game pieces" include: Kirsten Reese's *Kugelspiele* (2008/09); Éric Normand's *Card Game for an Omprivers' Orchestra* (2011); Il Hoon Son's *20 Questions* (2014), Marko Ciciliani's *Homo Ludens - expert level* (2013), Formula minus One (2014); several works by James Saunders.

certain ideas and elements that have been discarded. After an evaluation of the visual imagery of the screen score and discussion of questions about the audience, finally the game character of 3x3 will be analysed. The thesis ends with an epilogue consisting of a conclusion and considerations about future work.

2. Play and Games – Characteristics, Categories and Definitions

2.1. Play and Games – *Paidia* and *Ludus*

It is not easy to talk clearly about play and games. In the start of my research and my struggle towards clarification of these terms I had to face the differences between English and German, my native language. The nouns play and game are represented by the same word in German: *Spiel* means play, whereas *ein Spiel* is a game. On a basic level, games build one subset of the more general notion of play. Even though this thesis focuses on games and "game elements" and their relation to certain works of music, it would not make sense to ignore notions of play, because these two terms are closely related.

Play scholar Brian Sutton-Smith (2006) stresses the diversity of play forms or play activities pursued by children, adults or animals. A similar diversity he finds in scientific theories and studies about play from the wide range of disciplines treating them, like for example anthropology, sociology, pedagogics, economics or biology. In these he identifies seven "rhetorics of play", which are in part compatible, while others are contrary (Sutton-Smith 2006, 304). He uses the term rhetorics, while he also could have talked of functions or meanings, because they follow a certain narrative connected to broader value systems or ideologies, claiming that non-ideological science can only be an ideal but never really achieved. Among these are the "rhetoric of play as progress", which links play to learning and socialisation; the "rhetoric of play as power", which is about conflict and control; the "rhetoric of play as the imaginary", which idealizes imagination and creativity in play; and the "rhetoric of play as frivolous", which sees play as an idle act and is often linked to tricksters and fools who oppose authorities and a dominant order (Sutton-Smith 2006, 303-306). While Sutton-Smith avoids defining play, one of his fundamental arguments is that

ambiguity itself represents the most common attribute of play phenomena. Simple examples are playful behaviour like teasing, joking or acting, which all centre around the "as if" (Sutton-Smith 2006). In this sense, play can also be understood as something "in between" – in between reality and illusion; between fun and seriousness; or between security and danger.

An early agent of an idealistic and generalist view on play is Friedrich Schiller. He claims that there is a basic human drive to play, the so-called *Spieltrieb*, which he understands as a basic condition for human freedom and expression (Schiller 2005). Roger Caillois is a French sociologist, whose book *Man, Play and Games* is a standard work in game studies. Like Schiller, he believes that play is driven by an inherent human drive, which can come into action in two ways: as *paidia* or as *ludus*. *Paidia* derives from the ancient Greek word for child. It is on one hand "the motive power", "covering the spontaneous manifestations of the play instinct", "of improvisation and joy", on the other side it is the "elementary need for disturbance and tumult" and represents "primitive joy in destruction and upset" (Caillois 2006, 141-142). *Paidia* is present in all kinds of free-form play and children play. *Ludus* "is complementary to and a refinement of *paidia*, which it disciplines and enriches. It provides an occasion for training and normally leads to the acquisition of a special skill". *Ludus* represents "the taste for gratuitous difficulty" and is meant to add "a civilizing quality" to games, which "reflect[s] the moral and intellectual values of a culture, as well as contribute to their refinement and development" (Caillois 2006, 141-142). *Paidia* and *ludus* are not exclusive, but form two poles of a continuum. The character of *ludus* rises with increased regulation. *Paidia* with its denotations of freedom, spontaneity and joy is connected to play, whereas the regulation, discipline and the dependence on skills denoted by *ludus* is linked to games.

2.2. Game Categories – *Agon, Alea, Mimicry* and *Ilinx*

Similar to play, also the forms and examples of games are very diverse. There are card games like rummy or poker, board games like chess or *Monopoly*, gambling games like roulette, sports like boxing or golf. There are children games, guessing games, solitaire games, strategy games, party games and drinking games. And there is the newer phenomenon of computer games, ranging from sports simulations to first person shooters or online role-playing games, further extending the field.

Caillois (2006) tries to order this extensive field of activities. He notices that commonly used categories of games like the ones mentioned above, though not yet knowing of computer games, all follow different criteria: some refer to game implements or physical involvement, others to a specific location or atmosphere, to the number of players, their age or specific qualifications. Because these classificatory instruments differ from each other on a very basic level, they are hard to compare. As a solution he suggests four classes that aim to cover all instances of games: *Agôn, alea, mimicry* and *ilinx*.

Agôn refers to competitive games. These are based on rivalry among two or more competing players or teams, "in which equality of chances is artificially created" (Caillois 2006, 131). "[The] practice of *agôn* presupposes sustained attention, appropriate training, assiduous application, and the desire to win" (Caillois 2006, 132). Even though also *agôn* is based on skills, it is not identical with the concept of *ludus*, as presented before. In *ludus* "the conflict is with the obstacle, not with one or several competitors" (Caillois 2006, 143). But Caillois adds that even if *ludus* it is not dependent on an organised competition or leads to a winner, it nevertheless is "permeated with an atmosphere of competition", a "virtual *agôn*", in which the player challenges himself but compares with other players (Caillois 2006, 143).

Alea are games of chance, which build a strong contrast to games of *agôn*. "The player is entirely passive; he does not deploy his resources, skill, muscles, or intelligence", in other words, "*alea* negates work, patience, experience, and qualifications". "*Alea* [only] signifies and reveals the favour of destiny" (Caillois 2006, 133). He attributes games of *alea* a particularly "human" quality, as *alea* is the only of the four categories that does not exist in animal's play (Caillois 2006, 134).

Mimicry specifies games involving roles and masks, simulation and illusion. In these games the player goes through one of two different transformations: he "forgets, disguises, or sheds his personality in order to feign another" or "the mask disguises the conventional self and liberates the true personality" (Caillois 2006, 135-136).

Ilinx is connected to vertigo, delirium, thrill and disorder. It refers to games that induce another state of consciousness by physical involvement. It is found in many children games, but also in adventurous physical activities of adults like for example "extreme sports". (Caillois 2006, 138-140)

Games are often combinations of these classes. For example card games are often a mixture of *alea* and *agôn*. Caillois further pointed towards similarities and incompatibilities between them and the *paidia-ludus*-axis. According to him, *agôn* and *alea*, as well as *mimicry* and *ilinx*, follow the same principles: *Agôn* and *alea* depend on the creation of a basic equality of chances among the players. *Mimicry* and *ilinx* on the other side do not transform the conditions for actions but the players themselves. In *mimicry* the player becomes someone else, *ilinx* induces another state of consciousness. He further states that *alea* and *mimicry* do not have any relationship and tend to exclude each other. *Mimicry* is also closer to *paidia* than to *ludus*, because obligatory fixed rules do not apply well for it, rather do "rules for the dissimulation of reality and the substitution of a second reality" (Caillois 2006, 135). Also *ilinx* and *paidia* are closely related, because both serve "the desire for disorder and destruction, a drive which is usually repressed." (Caillois 2006, 135-139).

The continuum of *paidia* and *ludus* in combination with the four game categories *agôn*, *alea*, *mimicry* and *ilinx* seem to form a useful tool for the analysis of any kind of game-related activity, like the performance of game pieces, by identifying fundamental game principles and degrees of freedom and regulation.

2.3. Definitions of Games

Because games are so diverse, Ludwig Wittgenstein uses them as an ideal example to demonstrate his concept of family resemblance, claiming that different games – similar to Sutton-Smith's claim about play – cannot share a common definition but only build a word family, consisting of a network of characteristics shared or not shared by certain instances. (Wittgenstein 1958, 66-67)

Many game scholars do not follow Wittgenstein's believe that games do not share common characteristics but tried to define games by finding such common properties. One prominent and often cited work about play is the book *Homo Ludens* (1949) by Dutch cultural historian Johan Huizinga. He understands play as a "primary category of life" (Huizinga 1949, 3), which is not only "older than culture", but also a condition for and driving force behind all kinds of culture and art. According to Caillois, *Homo Ludens* "is not a study of games, but an inquiry into the creative quality of the play principle in the domain of culture, and more precisely, of the spirit that rules certain kinds of games – those which are competitive" (Caillois 2006, 123). Huizinga defines play, and implicitly also games, as followed:

Summing up the formal characteristics of play we might call it a free activity standing quite consciously outside 'ordinary' life as being 'not serious', but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner. It promotes the formation of social grouping which tend to

surround themselves with secrecy and to stress their difference from the common world by disguise or other means (Huizinga 1949, 28).

Caillois criticizes two aspects of Huizinga's definition. The first problematic assumption of Huizinga is that play would be "connected with no material interest", which excludes all kind of games of chance and forms of gambling. For Caillois games of chance are important and build one of the four basic game categories, which I will treat later. Caillois seems to transform this idea into one of his six characteristics of games: unproductiveness. When someone engages with gambling, as Caillois says, "property is exchanged, but no goods are produced." (Caillois 2006, 124) According to him, this quality separates play from work, as well as from art. A professional tennis or chess player is in his view rather works than plays. The second critique of Caillois addresses Huizinga's link between play and the secret or mysterious. He acknowledges the affinity between them: "All that is mysterious or make-believe by nature approaches play." But when secrecy or mystery transforms into play, "play exposes, publishes and somehow expends" them. In this way, play "tends to remove the very nature of the mysterious." (Caillois 2006, 124) Caillois defines play by six characteristics (Caillois 2006, 124-127):

1. **Free:** games refer to "a free and voluntary activity, a source of joy and amusement."
2. **Separate:** games are limited in time and space.
3. **Uncertain:** the outcome of a game is unknown; the player's actions are "free within the limits set by the rules"; error and surprise are possible.
4. **Unproductive:** play "creates no wealth or goods" and "is an occasion of pure waste."
5. **Governed by rules:** "precise, arbitrary [and] unexceptionable rules" replace "the confused and intricate laws of ordinary life."
6. **Make-believe:** "Many games do not imply rules" but "playing a role" by "acting as if one were someone or something else."

The last two points are exclusive. In Caillois words, "games are not ruled and make-believe", rather "they are ruled or make-believe." We can link this idea to the incompatibility of *mimicry* and *ludus* stated above. He argued, though, that rules and fiction have the same function. Rules even create fiction, because their arbitrary character gives rise to activity that has no correspondence in real life, thus these rule-based games are played "for real", instead of "as if" real (Caillois 2006, 127).

Other game theorists criticise the definition of Caillois and extended Caillois' critique on Huizinga, or emphasized other points. One commonly argued point is the question of the separateness of games. There are examples of games that are not limited in space and time and strong arguments were made against the separation from real life and the outside world that is connected with Huizinga's term "magic circle", but elaborating these would go beyond the scope of this outline. (Frissen et al. 2015)

Bernard Suits delivers a different and rather reduced definition, emphasizing the goals of games. For him there are four elements of games: the goal, the means of achieving the goal, the rules, and the "lusory attitude" (Suits 1978, p. 38-40). The "lusory attitude" represents "the acceptance of constitutive rules just so the activity made possible by such acceptance can occur" and is therefore not part of a game as system or artifact, but a psychological mindset that constitutes the activity of playing a game (Suits 1978, 32).

Computer game theorist Jesper Juul (2003) suggests a definition, which he developed as a kind of synthesis of other definitions, including the ones by Huizinga, Caillois and Suits:

A game is a rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable (Juul 2003).

Juul notes that the single points refer to different levels. Fixed rules, variable and quantifiable outcome and player effort refer to games as formal systems. Player effort and the attachment of the player to outcome characterise the relation between the game as a system and its player. The player's attachment to the outcome is a psychological feature, meaning that he really wants to win or achieve the goal. The player effort draws upon "both the fact that the game system can be influenced by player input and that the player does something" (Juul 2003). Negotiable consequences describe how a game relates to the world outside of the game. With the last point Juul also relativizes the separateness and unproductiveness of games proclaimed by Caillois; the relation between game activity and the outside world can be to some extent determined by the rules, but often they are instead negotiated by the players. Juul further notes that, even though all definitions of games contain the need for rules, their fixedness is questionable. It is possible that players subvert them, play "with" the rules or against them, in order to establish an alternative outcome. Juul calls this "player-organized criticality" (Juul 2003).

3. Game Pieces and Game Elements in Composition and Performance

3.1. Game Pieces

Many diverse historical links between games and music exist. There are a wide range of games that involve playing or "making" music, from festive games in Renaissance Italy like the *Giuoco della Musica* (Haar 1962) to video games like *Sing Star* or *Guitar Hero*. Musical games are used in children's education and music pedagogy², and many examples³ of program music, music theatre and concert dance illustrate games musically.

² See for example the improvisatory games in Trevor Wishard's book *Sounds Fun* (1990).

³ Curiously, tennis seems to be a game particularly often used in such works from the 20th century, with examples by Satie, Debussy, Kagel and others. See *Wimbledon's here, anyone for tennis music – from Satie to*

This leads me to my own particular area of interest and object of research, which are "game pieces". Under the term "game pieces" I understand works of music whose performance either integrates the activity of playing a game, or works in which the performance has a strong resemblance to playing a game. I see them as separate from games incorporating musical activity, educational music games and games as musical program, as presented above, though there might be borderline cases. I am trying to avoid both giving a fixed definition of "game pieces" and taking one of the many definitions of games, of which some were outlined in the previous chapter, as their basis.

It seems to me that many definitions of games compete with each other by focusing on certain game "elements" while leaving out others. With game "elements" I refer to central attributes of game definitions and categories, of which I identify the following as the principal ones: rules, the player's agency, uncertainty, skills, goals, obstacles, conflict, competition, chance and roles. These game characteristics can group in different constellations with varying accentuation in single instances of games. When looking at examples by Christian Wolff and John Zorn, and finally also at my own compositional work, I want to examine how these game "elements" are used and if they constitute a game-like or "gameful" activity among the performers.

Deterding et al. (2011) propose the term "gamefulness" as the "experiential and behaviour quality" of games as a complement to playfulness and relate these to Caillois' concepts of *ludus and paidia*. Furthermore, the concept of "gamification", a term that originated in the digital media industry, can be compared to my approach to conceptualise "game pieces" and may help to make it clearer. Deterding et al. (2011) define "gamification" as "the use of game design elements in non-game contexts." "Whereas 'serious game' describes the design of *full-fledged* games for non-entertainment purposes, "gamified" applications

Shostakovich? by Anthony Bateman, The Guardian Music Blog; <https://www.theguardian.com/music/musicblog/2015/jun/29/wimbledons-here-anyone-for-tennis-music-from-satie-to-shostakovich>.

merely incorporate *elements of games*" (Deterding et al. 2011, original italics). The authors further add that these elements "should be conceived more in terms of affording gameful interpretations and enactments, rather than being gameful" (Deterding et al. 2011). Simplified and related to the present purpose, even if a "game piece" or "gamified composition" does not fulfil a strict definition of a game, game elements can afford a game-like activity among the performers.

When the performance of music involves playing a game, relevant questions arise: What is the relation between the game and the music? Is the game aspect necessarily extra-musical or how does the game aspect influence the sound or the music? Or can these two realms even form a unity?

3.2. Indeterminacy and Uncertainty

The game-related compositions that I will discuss in the following are to greater or lesser degrees connected to the concept of indeterminate music, a term which got shaped by John Cage and other mostly American composers in the 1950s and 1960s. Even if driven by different motivations and ideas and using different methods, a common feature is that control over certain aspects of the notation or performance of the work was deliberately given up by the composer. By letting the performer take choices that were previously made by a composer, and that go beyond what is traditionally understood as interpretation, the role of the performer underwent some kind of empowerment. The tradition of indeterminacy of the 1950s and 1960s is commonly seen as a contrary development to European serialism, which tended towards control over all musical parameters by the score and rigid execution by the performer.

It may be that some examples of "game pieces" do not seem to fit into the tradition of indeterminate music at first glance. But independent from the used definition of games, three characteristics seem to be essential: Firstly, a game has rules. Secondly, it involves activity of the players, which is limited by the rules. And thirdly, the course and outcome

of the game are not fixed. This means that all game activity fluctuates between freedom and limitation. Thus the agency of the players, their ability and freedom to act – according to the rules – is an absolute precondition for any game situation. In relation to the performance of music: if it has anything to do with games, then it must have some degree of indeterminacy. The players must be able to make choices and the process of the piece is to some extent uncertain.

Closely related to indeterminate music is the term "experimental music", that is equally compatible to the uncertainty of games, considering that John Cage related the word "experimental" to "an act the outcome of which is unknown" (Cage cited in Nyman 1999, 1). According to Caillois this game characteristic could also be a source for the joy of playing games:

An outcome known in advance, with no possibility of error and surprise, clearly leading to an inescapable result, is incompatible with the nature of play. [...] The game consists of the need to find or continue at once a response, which is free within the limits set by the rules. This latitude of the player, this margin accorded to his action is essential to the game and partly explains the pleasure which it excites (Caillois 2006, 126).

It might be necessary to emphasize that not all examples of indeterminate music refer to the factor of uncertainty of the performance, but to the process of composition. Other works are indeterminate in regards to the performance but the performers are not meant to make active choices. Cage's use of chance operations in many of his works gives examples for both cases. While in some works he generated or structured material by throwing dices or using the Chinese oracle book *I Ching*, in other cases the performers apply such chance operations during the realisation of the piece but are not meant to make choices.

3.3. The Role of the Performer – Agency and Co-Creatorship

The role of authorship is different between games and works of art or music. An artist as the author of a work is crucial for the concept of the work, even if it is possible that there is more than one author or that the author deliberately disguises his identity. Most classic games cannot be attributed to one or more authors. Instead generations of players changed their rules and means while playing. Even modern commercial board games like *Monopoly*, *Scrabble* or *Risk* are usually more associated with their publishing company than their authors or "inventors". Only with the rise of computer games does this seem to have changed, in the way that besides the companies also few game "designers" get recognised as inventive creators among players.

However – very often a game is not particularly inventive, but consists of simple and arbitrary rules that can be turned into something elegant, imaginative or complex by the players. The players make a game happen not only by their effort and agency during the game, but also by their motivation to play and the acceptance of the rules. In "game pieces" the players take over control over the musical outcome from the composer, which makes them "co-creators". Clemens Gresser defines the "co-creator" as "a person who is given certain freedoms of what, as well as when and how, to play, when realizing indeterminate notations", adding that this "goes beyond what is traditionally understood as part of the performer's interpretation" (Gresser 2010, 193-194). By looking at what is in fact indeterminate in an indeterminate piece of music he distinguishes three generic types of "co-creators": the "structuring co-creator", the "improvisatory co-creator", and the "creative co-creator" (Gresser 2010, 193-194). "Structuring co-creators" have clear instructions about the musical content, as notated in the score, but they decide on the order of musical events. The second type, the "improvisatory co-creator", can be identified in pieces, in which this relationship of content and structure is inverted in comparison to the first type. In this case a formal framework for the order of events is determined, but the actual sounds are not fixed at all or the instructions are so vague that it is finally left to the performers what they play. The third type Gresser calls "creative co-creator", which applies, when "the notation sets a

general idea or gives musical ideas, but neither the structure nor the exact sonic ideas are determined absolutely by the notation" (Gresser 2010, 194).

Gresser acknowledges that "creative co-creatorship may sound tautological" (Gresser 2010, 195), but he claims its importance for central works of indeterminate music. It shall emphasize that the performer's role includes actions that are usually connected to the composer, namely "choosing material as if composing music, and deciding when the chosen material should sound" (Gresser 2010, 195). Gresser's classification is useful for differentiating the role of the performer in "game pieces" and other indeterminate music.

3.4. Christian Wolff – *Duet II* (1961)

3.4.1. The Piece

The music of Christian Wolff from the late 1950s to mid 1960s has been repeatedly related to games (Nyman 1999, 17; Thomas 2010; Saunders 2015). It has been described as having "game-like features" (Behrman 1965, 67), involving "game-strategy" (Rzewski 1998, 14), and counting as "game-pieces" (Schwartz 1993, 312). In a conversation with Cole Gagne (Zorn 1998), the composer at first rejected this analogy by saying that he wrote music and did not construct games. But following this statement, he acknowledged this analogy used by others as obvious and mentioned that he also used it "trying to explain how the music worked" (Zorn 1998, 258). In the following paragraph I will try to determine which aspects of his music might have led to the common belief, that his music "works" like a game and re-examine this idea. The British pianist Philip Thomas wrote about Wolff's music from a performer's perspective:

The beauty of performing Wolff's music is to be found in the balance between control and freedom: of being situated in such a way that one is faced with new and unusual contexts and yet also having the freedom to make individual choices within that context (Thomas 2010, 213).

This statement shows a fundamental similarity to games: the rules of a game set up a situation with an unpredictable structure and course, and create possibilities of action and choice for the players. The "balance between control and freedom" corresponds with Caillois' terms *ludus* and *paidia*. In indeterminate music the score sets up the situation. According to Philip Thomas, "Wolff is rarely involved in lengthy collaborations prior to the composition of a work. Instead, he is interested in the working relationship between composer and performer through the medium of the score" (Thomas 2010, 211). Wolff said about how he understands the function of the score:

A composition (a score) is only material for performance: it must make possible the freedom and dignity of the performers; it should allow at any moment surprise, for all concerned, players, composer, listeners" (Wolff cited in Thomas 2010, 215).

I am arguing that surprise is central for the game-like quality in Wolff's music. He mainly creates these moments of surprise through innovative use of "cueing systems". I use the word "system" in regard to these cues for musical events, as they are not organised in a linear way, like traditional music notation or more conventional graphical notation. Instead they use a distinctive graphical vocabulary of notation, rely on complex coordination between the performers and involve choice. *Duet II* (1961) for horn and piano is a striking example of one of Wolff's "gameful" pieces. The score consists of one page, with an additional two and a half pages of performance instructions and explanations of the graphical notation. The piece consists of six sections or modules varying considerably in their number of events and in their character. Two of these are solo sections for horn or piano. The performers decide on the order of sections, on how often sections shall be repeated or even left out, and also when to end. The degree of determinacy and freedom in regard to pitch, duration, timbre, dynamics or the number of tones changes from event to event. While exemplarily describing a part of one of the six modules in the following, I will explain some types of events and ways of coordination or "cueing" between the performers, illustrated with quotes from the performance instructions (Wolff 1961).

[illegible]

The other seven tones are played respectively in a lower octave and also either a semitone higher or lower than given in the stave. Two of the seven tones are released simultaneously ("2J") and two others are held longer until a new tone is played by the horn, of free pitch and duration. The release of the two held piano tones and the new horn tone (of free duration) should happen "as simultaneously as possible" (vertical line between players notes introduced by a tie). Additionally, the release of the horn initiates a glissando to another tone of free pitch and duration, whose attack and release should again be "as simultaneous as possible" (vertical line without tie), although the piano tone, which is taken from pitch collection "h" but transposed to a lower octave shall be "depressed silently".

To make it even more complicated, the hornist has the option to not end the glissando with the coordinated event at this point, but change its direction to another tone of free pitch and duration. But before the simultaneous event, coinciding with the horn glissando direction change or end, the piano has to do a plucked ("pizz") tone in a pitch from "h", which immediately cues a horn event consisting of two tones of free duration, whose pitches are also from "h", but transposed to a lower octave and by a semitone up or down. After these two tones the piano makes four short tones in pitches of "h" in the indicated octave but a semitone higher or lower while the horn continues with three tones of free duration and pitch, but particularly "unequal" character. The duration of silence before the next event is free, "though it will be found useful to consider relative location in space as an indication of when to play something", as Wolff notes. The last event of the example shown in Figure 1 consist of two coordinated short tones; the one of the horn is of free pitch and played pianissimo, while the piano transposes a pitch of "h" to any lower octave. Both attack and release of the tones of the two players should happen as "closely as possible", "without any intentional signals". The section continues with coordinated events of a similar degree of complexity.

David Behrman assumes that the "complexities of this notation are directed less at an arrangement of sounds resulting from performer's actions than at the conditions under which their actions are to be produced" (Behrmann 1965, 73). The described example clearly demonstrates a seemingly exaggerated complexity, which indeed does not relate to a complex organisation of sound or difficult playing techniques but to complex modes of interaction between the players; of anticipation and response.

It has to be said though that this module seems to be the most complicated of the piece, and the given freedom of choice allows for simplifications. For example very long durations are possible to slow down the process. It would also be possible to leave out a section by intention. Other sections are much shorter and easier to execute, as can be seen in Figure 2. It shows a complete module consisting only of few events with only one of them optionally involving coordination between the players in the form of a simultaneous release of tones.

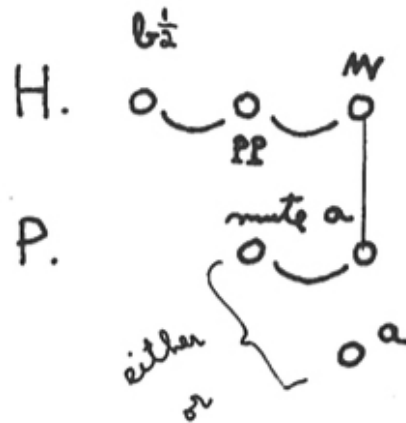


Fig. 2 - Detail from score of *Duet II* (Wolff 1961).

Wolff's "cueing systems" build a specific kind of tension, which arises from the expectation of the performer awaiting his cue. The most extreme form is a cue in which the responding performer has to execute both the attack and the release of his sound as simultaneously as possible to the other (see last event of Fig. 1). Even though he knows what he has to respond to, it is absolute not clear, when these cues actually happen, until they happen. Wolff himself said about the musical result of his "cueing systems" that "the rhythm produced by that situation is like no other rhythm. [...] [I]t's a rhythm that depends upon feedback, rather than on an idea about rhythm" (Zimmermann 1976, 26-27). By comparing recordings of performances of *Duet II*, Behrmann identifies "characteristic sound combinations, recognizable as the composer's 'signatures', just as a game has its characteristic 'moves'" (Behrman 1965, 73). He describes them as "grace notes jumping back and forth among players, the sudden cut-off of a long sound just after another begins, [and] the thin sustaining sound made by a player who is waiting for his cue and is not sure whether he may have missed it" (Behrman 1965, 73).

3.4.2. The Game Character

Caillois (2006) identifies the moments of surprise and tense expectation as an aspect of games, which arise through the impact of chance. But, as Wolff demonstrates, surprise can also evolve from the interaction between the players if the actions of the players involve a degree of freedom and depend on mutual responses. Wolff's game-like pieces thus seem to be orientated towards the experiential qualities of the performance, experienced both by the performers and the audience as tense expectation. But these characteristics also shape the peculiar nature of the music, like the musical qualities attested by Behrman or the rhythmic character described by Wolff himself.

Another "gameful" aspect can be identified in the way the modularity of the sections is carried out. The piece starts with one player choosing a section and playing its first sound, though it is not defined which player. The same procedure applies for any further section after the first has finished. The other player has to identify the fragment that this sound belongs to and continue with the cued events. This is a complicated task as there are six fragments and the initial sound is often only partly determined. Only in the one section that both players can start, the pitch of the starting sound is free for the horn player to choose, otherwise the initial event always relates to one of the pitch collections. Several single pitches appear in two collections, and one module begins with a pitch from collection "b" transposed a semitone (Fig. 1), thus further extending ambiguities of these starting signals by overlapping pitches. This not only allows mistakes, it seems that the possibility of making mistakes is created by the composer, because it could have easily been avoided by distinct starting cues and non-overlapping pitch collections. Caillois identifies the possibility of making errors as a constituent factor for games of skill and their attraction:

Every game of skill, by definition, involves the risk for the player of missing his stroke, and the threat of defeat, without which the game would no longer be pleasing. (Caillois 2006, 126)

In my opinion Wolff stresses this game quality by giving instructions about how to proceed in this case: "As soon as either player realizes that the two are not playing together, he should make some signal to that effect and both should stop and start again, at any section, as they started the piece" (Wolff 1961). Behrman emphasizes that such "breakdowns in coordination are a part of the piece and have musical characteristics, in performance, of their own—rhythms and pitch structures, for instance, which have a quality different from the rest of the music" (Behrman 1965, 67). He further mentions the possibility that a player might want to trick or confuse the other player by playing sounds that serve as ambiguous cues by starting a fragment with an undetermined pitch cue and choosing a pitch that is part of another cue. (Behrman 1965, 67)

Duet II can be called a game of skill that affords a masterly training of specific skills and a profound knowledge of the rules and possible moves of the game. The rules determine how the notation translates into actions and interactions of or between the performers. Needed skills involve the ability to make fast reactions and decisions, listening skills like recognising pitches and other sound characteristics and relating these to different pitch collections and the modular form parts of the piece. For achieving this, a deep knowledge of the material of the piece, like the beginnings and courses of the single modules and the pitch collections, is essential and can be compared to the knowledge of moves and tactics in a game. But besides the importance of skills, there is also a creative component, which according to Thomas not only evolves from the possible choices of the performer about with pitch to use, how long to play a sound or if playing an optional event, but also from both the written instructions and the actual events of the score that involve traces of "ambiguity or even perversity" (Thomas 2010, 216):

Whilst a set of rules are in place to guide the performer's involvement in the piece, it seems that often there is something which serves to steer away from a straightforward playing of the game. The composer acts as *agent provocateur* to encourage the performer to deal with a complex situation creatively, usually involving dialogue (musical or verbal) with other players. (Thomas 2010, 216)

More than pure games of skill, pieces like *Duet II* represent "creative games" that involve performers as "creative co-creators", who have freedom and choice on various levels: in what sounds they play, in deciding which modular form parts to play, in which order and how often, and also in how the rules are interpreted and the game is played. Rzewski noted that other composers of the 1950s and 1960s had similar approaches to indeterminate music, but he attributes Wolff "particularly elegant solutions – precisely because he was not so concerned with the final result, but with the game-process itself as a work of art" (Rzewski 1998, 14).

3.5. John Zorn - *Cobra* (1984)

3.5.1 The Piece

The American John Zorn seems to be the first composer using the term "game pieces", relating to a series of works for improvisers dating from 1976 to 1990. *Cobra* (1984) is the best-known example of "game pieces", performed by improvisers all over the world until today. All titles of his "game pieces" derive from existing games⁴, even though the relations to these games are very loose. Scores of these pieces have never been published, apparently as an intentional act to emphasize the importance of oral instructions in rehearsal (Zorn 1998, 196-197). An unofficial "score" of *Cobra* (Figure 3) though, consisting basically a list of all the possible cues, and further notes by Stephen Drury about their execution have circulated through circles of improvisers (Brackett 2010, 48). Still this material does not answer all pragmatic questions about the application of the rules, which, according to Brackett, attached *Cobra* with an "enigmatic aura" (Brackett 2010, 47). About his motivation to create rule-based systems for improvisers, Zorn said:

⁴ These are *Baseball* (1976), *Lacrosse* (1976), *Dominoes* (1977), *Curling* (1977), *Golf* (1977), *Hockey* (1978), *Cricket* (1978), *Pool* (1979), *Archery* (1979), *Tennis* (1979), *Track and Field* (1980), *Jai Alai* (1980), *Goi* (1981), *Croquet* (1981), *Locus Solus* (1982), *Sebastopol* (1983), *Rugby* (1983), *Xu Feng* (1985), *Hu Die* (1986), *Ruan Lingyu* (1987), *Hwang Chin-ee* (1988), *Beziue* (1989) and *Que Tran* (1990).

Game pieces came about through improvising with other people [and] seeing that things I wanted to happen weren't happening. I'd wonder, 'Why aren't people leaving more silences?' So I'd write a piece for improvisers that inherently had a lot of silences. Or, 'Why doesn't everybody, all of a sudden, change at one time?' So then I'd create a little system and write a piece involving that (Zorn cited in Brackett 2010, 62).

Apparently Zorn does not relate to inspirational abstract ideas or concepts, as composers often do. Instead he calls the experience of his practise as an improviser his starting point. While trying to create something that he misses in common practice, he implicitly compares composition to an innovative form of "problem solving" (Brackett 2010, 61). Zorn himself mentions his aspiration to avoid any inhibition of the personal style or language that characterise improvisers, as followed:

I wanted to find something to harness the personal languages that the improvisers had developed on their own, languages that were so idiosyncratic as to be almost unnoteable (to write it down would be to ruin it). The answer for me was to deal with *form*, not with *content*, with *relationships*, not with *sound*. (Zorn 2004, 199, original italics)

Cobra is an interactive rule-system for collective improvisation. Its rules control the relationships between the performers and their action while hardly limiting "what" they play. Though the number of performers of *Cobra* is open, Zorn mentioned 10-20 musicians as an appropriate size of an ensemble (Lange 1991).

Besides the musicians there is a "prompter", who can be understood as a kind of moderator. He receives requests for specific cues from the musicians and shows the respective cue card to the performers. The "prompter" also indicates downbeats when the cues are taken into action. He represents an authority for the group through his power to not accept requests and to even initiate cues on his own.

3.5.2. The Rules of *Cobra*




The following description of the cues and rules is based on the notes by Stephen Dry (Brackett 2010, 48; Saunders 2016a). The main cues, as shown in the left column of Fig. 3, are grouped into six categories that are linked to different parts of the body – mouth, nose, eye, ear, head, and palm. To request or "call" for a specific cue, the musician has to point to the corresponding part of the body with his finger and show the associated number with the fingers of the other hand. If the prompter accepts the request for a cue, he puts it into action by indicating a downbeat with his hand.

The mouth cues are related to changes of the currently playing performers. Previously active players stop and inactive players enter abruptly with "Substitute Change" or gradually with "Substitute Crossfade". "Pool" is a cue similar to "Substitute Change", but with the option for active players to change their way of playing radically instead of stopping. Nose cues include: changing "Duos", found through eye contact or a single steady duo in the case of "Buddies"; with "Events 1, 2 or 3" the initiator chooses a number for how often everybody has to play an event; "Trades" means that the performers pass around to each other "who is playing", like in a bucket brigade. When in "Cartoon Trades", the players have to rapidly pass around and connect short sounds by eye contact. The "Ordered cartoon trades" follow the seating of the musicians in rounds.

The ear cues refer to group inversions and changes of dynamics. "MΔ" means that the currently playing musicians keep playing, but change the character of the music radically. "GΔ" is the opposite of "MΔ" and tells currently inactive players to displace the active ones, but continuing the character of the music. "VolumeΔ" means diminuendo or crescendo, chosen and indicated with gestures by the initiator. Head cues contain "Sound Memory", which means that the current musical situation has to be memorized with the aim to be recalled later, optionally with the help of making notes. Three different instances of these "Sound Memories" can be used. The palm cues relate to the end of the piece, implying either an abrupt "Cut", a "Coda" of six to ten seconds or "Hold and Fade".

COBRA

COPY OF ZORN'S
SCORE

MOUTH Yellow	1	P	Pool	GUERRILLA SYSTEMS Squad Leader + 2
	2	R	Runner	
	3	S	Substitute Δ	
	4	SX	Sub Crossfade	
NOSE White	1	D	Duos	TACTICS ↗ 1 Imitate ↔ 2 Trade - 3 Hold ↓ 4 Capture ↻ 5 Switch/Crossfade
	2	T	Trades	
	3	E	Events 1, 2 or 3	
	4	B	Buddies	
EYE Orange	1	CT	Cartoon Trades	OPERATIONS (Squad Leader ONLY) Called with FIST (I) DIVISI Memory Drone, Squad Leader Tactics and Systems Control (II) INTERCUT Locus Unit Return to Same Sound (III) FENCING Unit with alternates
	2	CO	Ordered Cartoon Trades (with guests)	
EAR Blue	1	MA	G=G MA	
	2	GA	M=M GA	
	3	V	Volume Δ	
HEAD Red	1	1	Sound Memory 1	Some Locus Hand Cues ↓ thumb = stop ↗ hand = rhythm ? finger = pip. - hand = drone ↔ back and forth = trade ↓ one = intercut ↻ cut = change
	2	2	Sound Memory 2	
	3	3	Sound Memory 3	
PALM Black	1		Cut	
	2		Coda	
	3		Hold & Fade	

John Zorn © October 9, 1984 NYC

Fig. 3 - Score of *Cobra* (Saunders 2016a).

Besides these main cues and their corresponding rules, there is a complicated system of playing "against" them, called the "guerrilla systems", all communicated with specific hand signs. These work either for a single player or a "squad" or "unit" of three players, which can be active for up to seven downbeats. Wearing a headband indicates their "guerrilla status". "Guerrilla fighters" or "squads" may ignore the cues given by the "prompter", but still can make "calls". They can apply "Tactics" ("Imitate", "Trade", "Hold", "Capture", "Switch/Crossfade") to the other players or "Operations" within the squad. When

applying "Divisi", all "non-guerilleros" stop playing and the "Squad Leader" takes over the function of the "prompter", controlling the game by initiating cues. An "Intercut" means that only the "Guerrilla Squad" plays a trio section, while they can direct each other through the "Locus Hand Cues" that represent certain musical events or types of material. In "Fencing", also called "Ivesian Trio", the "Squad Leader" improvises in a recognisable genre, while the other squad members have to play simultaneously in a contrasting genre.

3.5.3. The Game Character of *Cobra*

As the last paragraph demonstrates, *Cobra* features an extensive catalogue of rules. Rules build a necessary condition for games, but not a sufficient one. Thus, what makes *Cobra* a game? The title of the piece is taken from a strategic board game that simulates a battle of the Second World War, which was fought 1944 in Normandy. Brackett notes that "[the] rules – spread out over eight, tricoloured pages – describe permissible moves and strategies available to the various British, American, and German infantry, air and tank (Panzer) divisions and units fought in this decisive European battle" (Brackett 2010, 44-45). Even if the relation between the board game and the game piece is loose, basic similarities can be attested: both rely on a large set of rules and both involve conflict and cooperation between (war) parties. By comparing different performances of the past⁵, it seems that the main conflict in *Cobra* is the conflict of interests between the individual performers. While trying to make their "call" for cues, the performers also call for, or "fight" about, the attention of the prompter.

The motivation to call for cues has to come from the performers themselves. Even if every performer is always free to call for a cue, no one forces him to do so. The performer needs to have a motivation to do so, which may derive from the joy of playing the game. Although the prompter can initiate cues on its own, it is the agency and initiative of the players that

⁵ Many video documentations of performances of *Cobra* can be found on Youtube.

can make it a "gameful" situation. Besides the egoistically driven, and potentially musically motivated conflict between performers, also a form of cooperation can emerge, like the alliance between British and American forces against Nazi-Germany in the namesake board game. It is present in the formation of the "guerrilla squads", which can subvert the rules and impose command-like "tactics" on the other players. The role-playing "guerrilla fighters" with their headband masquerade exemplify the game principle of *mimicry*. The "guerrilla fighter" represents an outlaw, which is not bound to the rules and authorities. This possibility of going against the rules or playing "with" them can be seen as an aspect of loosening the regulations and discipline of *ludus*, a step towards *paidia*. Overall, if the "elementary need for disturbance and tumult" exists, as Caillois calls the origin of *paidia*'s "unruly character" (Caillois 2005, 141), it can definitely be realized and recognised in *Cobra*.

The mentioned conflict between the performers' intentions is not a real competition that leads to a winner of the game, although among several players requesting a cue only one can prevail. There is no global goal, so it is not a game in a strict sense according to systemic definitions. It seems that Zorn shows no interest in games that create artificial equality and competition, but sees games as a metaphor for society or an experiment about social behaviour by setting up rules and instances of control, power and collaboration:

I basically create a small society and everybody finds their own position in that society. It really becomes like a psycho drama. People are given power and it's very interesting to see which people like to run away from it, who are very docile and just do what they are told, other try very hard to get more control and more power (Zorn cited in Bailey 1992, 78).

Zorn emphasizes the importance of having performers with different personalities and skills playing or rather fulfilling different roles, which make the performance versatile and vibrant, while the roles can also be explicitly musical, or musically motivated:

Some players are really kind of conceptual, thinking about structuring a piece of music, using these signals and trying to create some kind of compositional flow in their heads spontaneously. While others are, you know, creating problems (Zorn cited in Bailey 1992, 78).

Based on his experience of performing *Cobra*, Dylan van der Schyff (2013) refers to the high demand of attention and information processing skills. Citing Jeff Pressing, he specifies these skills as followed: “real-time sensory and perceptual coding, optimal attention allocation, event interpretation, decision-making, prediction (of the actions of others), memory storage and recall, error correction and movement control” (Pressing cited in der Schyff 2013, 5). This challenge for the participants suggests calling *Cobra* a game of skill.

Consequently, I am arguing that *Cobra* employs several game elements that make its performance not only a playful but also a "gameful" activity for the performers. It is playful and "gameful" because both poles of the *paidia-ludus* continuum are richly developed, to stay with Caillois terminology, and "game elements" like the player's agency in the form of "creative co-creatorship", the unpredictability of events and changes, the deployment of skills and the role-playing character of *mimicry* are present.

In an interview led by Art Lange (1991), Zorn talks about the spectacle character of *Cobra* and compares it to a sport event in the way it attracts the interest of the audience. Indeed, the physicality of the prompter's gestures while signalling cues and downbeats, and trying to see everybody and everything from the performers, as well as the hand signs of the performers while fighting about the attention of the prompter, give the piece a highly specific and energetic performative quality. Zorn admits that this happening on stage can distract from listening to the music, but adds that in the end it is still essentially about making music and about listening (Lange 1991, 35). The extent of the spectacle probably varies within different performances and depends on the constellation of performing musicians.

My impression is though that in *Cobra* the spectacle dominates the overall character of the piece strongly, and that the large number of partly complicated and partly contrasting rules and possibilities inevitably lead to conflict, confusion and turbulence. But these factors also constitute a part of the game character of the piece. None of the cues of the game relate to sound.

The musical material and the qualities of sound solely depend on the performers, their style and taste. According to van der Schyff, "the non-idiomatic nature of *Cobra* allows musicians from various backgrounds to meet on neutral ground, where acquired techniques and attitudes may need to be reconsidered" (van der Schyff 2013, 7). Although *Cobra's* rules do not control musical material or sound, they nevertheless strongly shape the musical outcome. The resulting music represents a collage aesthetic typical for Zorn's music, which is characterised by fast changes and in the case of *Cobra* also represents the hectic quality of the performance and the clashes of personal styles.

4. Composing 3x3

4.1. Concept

The practical part of my research culminated in a piece for 9 musicians with the title *3x3*. It was informed by my investigation of games and "game pieces". My aim was to create a playful and "gameful" situation for the musicians during performance, which is both challenging, fun and to some extent unpredictable. The game qualities I tried to create are though not meant to work separately from the music. Instead I tried to integrate rules, interaction among the performers and their musical possibilities.

3x3 uses a projected computer-generated screen score, implemented with *Max/MSP/Jitter*. This screen score mainly consists of graphical symbols that were designed in collaboration with Robert Shuttleworth. The audience can also see the projected screen score during performance and relate it to the performers' actions and the music. By doing this, members

of the audience can possibly empathically re-enact the "gameful" qualities of the piece, in a similar way to spectator sports.

The graphical symbols of the screen score represent a limited number of playing instructions that I call playing modes. These playing modes barely relate to qualities of sound, but are open and abstract. They represent very basic musical relations and at the same time means for the performers to relate to each other: foreground and background, imitation and opposition. *3x3* requires spontaneous articulations of musical ideas, while creative interpretations of the playing modes and the expression of a performer's personal style are encouraged. Improvisation builds a general framework for *3x3*, though the piece also involves non-improvisatory elements.

A different type of playing mode is called the "blind mode", in which the performer has to cover his eyes with a sleep mask, which disconnects him from the screen score and the visual communication with other performers. A player in "blind mode" is allowed to freely improvise under the unusual situation of blindness and the possibly resulting limitations. The end of the "blind mode" is signalled to the blind player through a sonic cue by the other musicians.

A non-improvisatory element of *3x3* consists of the so-called "signature sounds". For these each performer has to determine one short sound and one longer sound or phrase before the performance. When cued by visual elements of a different kind than the playing modes, the short or long signature sound should be immediately played once. While the short signature sounds have signalling functions and are used rhythmically, the long ones create recurring musical events as points of start and return.

Furthermore, the performers can interact with the screen score through the use of foot pedals. By pressing the pedal, a performer can either reject his current cue and playing mode or call for "free play mode". During "blind mode" the function of the pedal changes and allows the player to take all other players out of their currently active modes for a limited time.

4.2. Personal Paradigms: Openness and Flexibility

The piece is not just open in its instrumentation, but also concerning the background and skills of the musicians. For now I try to find musicians experienced in free improvisation with a range of instruments as well as personal styles or languages that reflect their personality. I am interested in the possible mediations and clashes of these personal styles and idioms. What I stated here reflects my momentary interest and preference but in the future I can also imagine very different realisations: with a group with maximum unity based on their musical background or philosophy of improvisation, with a group of the same instruments, realisations within a genre like jazz or rock, as well as adaptations or inclusions of dancers or actors.

One limitation on the choice of performers or rather the instrumentation is the need to be able to react fast and to be able to play without the need to look at their instrument – or at least not constantly and for longer durations – but being able to look at the projection instead. One example from an early workshop session in the process of composing this piece was a performer playing a modular synthesizer who just could not react fast enough both to start and stop playing. He further needed to look at his instrument and missed cues on the screen.

Under flexibility I firstly understand the possibility to make changes in the piece and secondly allow different technical realisations. Concerning the first point, I developed the software system in a way that its structure and form, the durations and modes can be changed for each performance and for group of musicians according to their instruments, personal style or language, as well as based on the experience gathered from previous performances and from the rehearsals. Also the overall duration of the piece can be varied. As I plan to continue to work on the piece and find different ensembles and groups of musicians to perform it, I see all future realisations and versions as part of the same piece – as part of a longer process of composition. I advocate the primacy of the performance over the work. The technical flexibility has the aim to allow performances in small venues and off-

spaces with limited technical facilities. If amplification is used, its main aim is to establish an equal balance of loudness levels between the instruments. It is also possible to perform "non-interactive" versions of the piece without the use of the foot pedals.

4.3. Playing Modes

The playing modes consisting of "leading voice", "background mode", "imitation mode", "opposition mode", "blind mode" and "free play" are indicated by symbols. With the exception of the "blind mode", the performers, especially as "leading voice" and "opposition mode", are supposed to start playing as soon as possible after the corresponding symbol appears. This does not mean that the performers have to play constantly, but long pauses should be avoided. If a player has reasons not to play or does not want to play, he can always reject by pressing the pedal (see below).

The following performance instructions are meant to give a basic understanding of my ideas about the playing modes, partly involving examples of types of musical material and structures. They do not substitute an oral instruction to the playing modes and other issues relevant for the performance. The meaning of the playing modes is finally collaboratively determined through discussion with the musicians during rehearsal.

"Leading Voice":

"Play free as a leading voice! If you are the only one in this mode, you do a solo. Otherwise, you play together with the other leading voices. Try to keep some consistency in your playing during a single cue. Play for example strong ideas, expressive phrases or gestures."

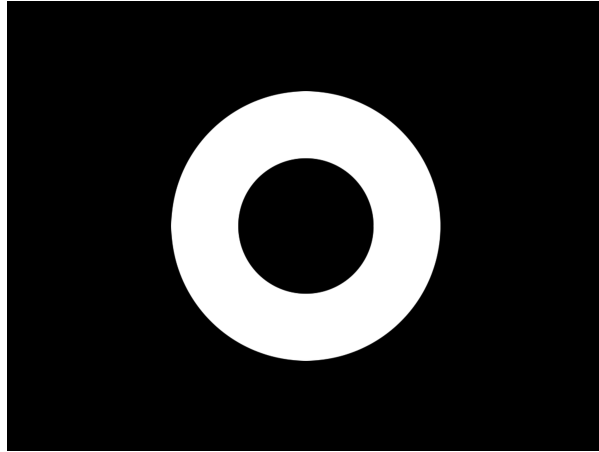


Fig. 4 – Symbol for Leading Voice.

"Background Mode:

“Play in the musical background together with the other background voice(s) or alone when it's only you. You can accompany the leading voice(s) if there is one or more of them active. Don't be louder than the leading voice(s). If there is no leading voice, refer to the blind player. Musical material could for example be textures or sparse noises, drones or sustained sounds, repetitive structures and simple or consistent rhythms.”

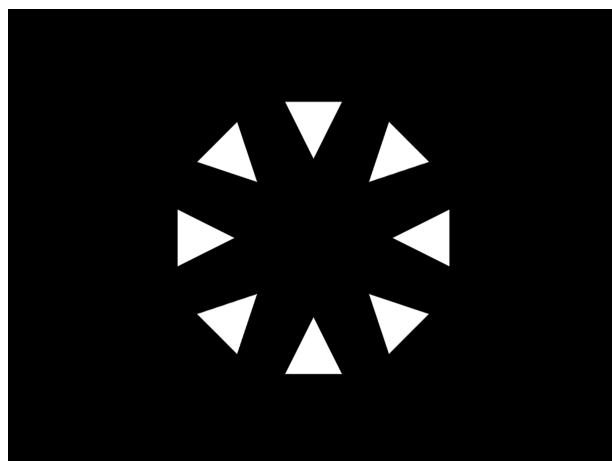


Fig. 5 – Symbol for Background Mode.

"Imitation Mode":

"Imitate or translate what the leading voice or one of the leading voices is playing. You may repeat it, vary it and develop on it. If there is no leading voice, refer to the blind player."

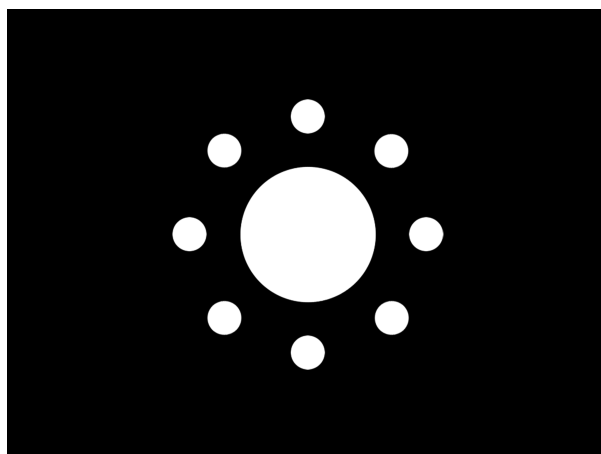


Fig. 6 – Symbol for Imitation Mode.

"Opposition Mode:"

"Play against the leading voice(s)! For example play contrasting material and structures. If there is no leading voice, refer to the blind player."



Fig. 7 – Symbol for Opposition Mode.

"Blind Mode":

"Put on your sleep mask. You can play freely. Put your sleep mask off when you hear the short signature sounds from all players. Pay attention to this! For as long as you press the pedal, all active players turn inactive. You can use this to play a blind solo, or to create pauses or silence. But the overall duration of turning the others off is limited to 20 seconds per minute"

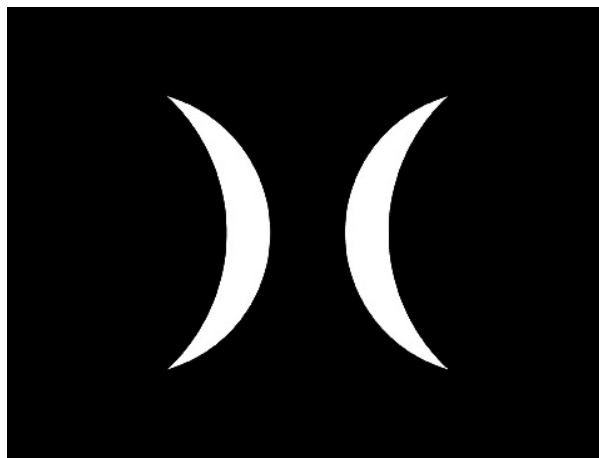


Figure 8 - Symbol for Blind Mode.

The possibility to play freely when "blind" has different implications for every performer, mainly depending on his type of instrument. Some performers would need to prepare special techniques or material for this purpose. The duration of the *blind mode* is between 40 and 80 seconds.

4.4. Signature Sounds

All musicians determine one short sound (less than 1 second) and one longer sound, gesture or phrase (ca. 3-7 seconds) before the performance as their signature sounds. This does not imply that they should be or have to be characteristic of a personal style of the player; they are rather the respective performer's signatures for the performance of the piece. The two shall be different from each other in character. Especially for the short signature

sound the performers are encouraged to use a very specific (extended) technique or generally something that they would not play "anyway" or incidentally. A short bright flash on the performers' screen division cues the short signature sound, while the long signature sound is indicated by a colourful pattern for about three seconds. When the cue appears, the performer has to play the short or long signature sound immediately and only once. The signature sounds can be varied slightly during the performance, but the common essence should be recognisable.

The signature sounds work independently from the other playing modes, meaning that the latter, with the exception of the blind mode, are interrupted by the signature sounds. Especially the long signature sounds build recurring events that are meant as starting points for different developments and can be the source for imitation and opposition modes. The short signature sounds can function as signals to either mark changes of sections or leading voices. As mentioned before, when the whole ensemble is meant to play the short signature sound, it signals the end of blind play. Generally speaking, the signature sounds are meant to form a contrast to the other more open or improvisatory playing modes by the introduction of these predetermined elements.

4.5. Interaction through pedals

The use of the pedal is not essential for the playing modes, but meant to enhance the "gamefulness" for the players by extending their agency. More specifically, by using the pedals they are able to affect the screen score and react to it. I chose sustain pedals as used with electronic pianos or keyboards as the ideal interface for my purpose, because they are small, easily available, compatible between models and controlled by feet, thus keeping the hands free for playing.

Even though the software is only processing the input of the pedals like an on/off switch without any continuous data, they have advantages compared to footswitches, especially by avoiding both click noises and the need to press a second time to turn the switch of.

Because the sustain pedals are analogue and only produce a change of voltage when pressed, they are connected to the computer via the *ipson_compact* OSC interface, which was developed at the Institute of Sonology. This device translates the analogue input into digital signals using the *Open Sound Control* protocol, which *Max/MSP* can process. To connect the Jack plugs of the pedals to the pin inputs of the *ipson_compact*, a custom-built solution had to be developed.

Besides the mentioned advantages of using pedals as control interfaces, they also impose a clear limitation of control compared to other control interfaces like for example MIDI-keyboard, -pad controllers or touch screens: because the pedals work like single switches, they can only control one thing at a time; parallel channels of information or choice between alternative options are not possible. Even though the functions of the pedal use has been changed during the compositional process, I decided early to give the pedalling different functions depending on if the player is "active" or "inactive" in the given situation. Active and inactive mean in this respect that the player is currently in one of the four modes and told to play or if his screen division is blank and he shall be quiet. This separation of functions allows me to make the most out of the given limitation imposed by the nature of the pedals.

The functions of the pedal in the recent version are called "call" and "reject". A player can for example "call" for a cue, when he wants to play, has a good idea or believes that he can add something valuable to the current musical situation. By "calling" a player gets into "free play", which will last 30 seconds, if not caused to cease before by "rejecting" through pressing the pedal again. The player can also change from a cued "playing mode" into "free play" by first rejecting, then "calling". "Free play" (Fig. 9) can only be attained by the choice of player himself, but is limited by the software to happen only once in two minutes. If the player tries to call, but already used the blind play within the last two minutes, this is indicated on the screen by a yellow frame.

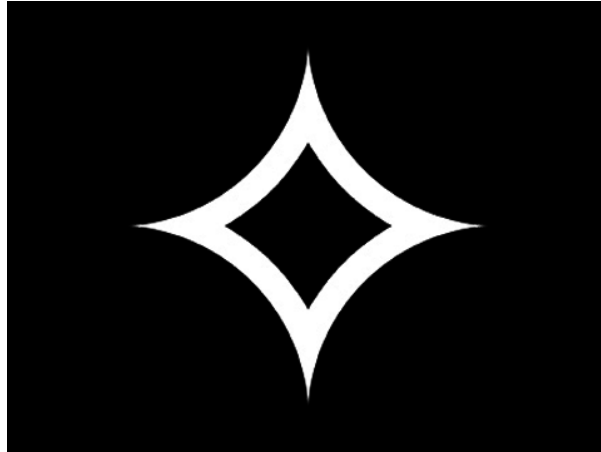


Fig. 9 – Symbol for "Free Play".

A player can reject a cue when he for example does not want to play, when he has no good idea what to play in the given mode or if he believes the musical situation would not benefit from his contribution. Every player can always reject, except when he is "blind".

4.6. Screen Score Module

The computer-controlled screen score of *3x3* makes use of *Jitter*, part of *Max/MSP/Jitter*, which generally deals with processing matrices and more specifically is meant for graphics and video use by defining each pixel as an element of a matrix. Musician and graphic designer Robert Shuttleworth designed the visual elements used in the screen score in close collaboration with myself. What my screen score module of the software does, on a very basic level, is to receive a stream of lists with nine numbers from other modules of the patch. Each of these numbers represents one field of the split screen or one performer, and its values select image files. Furthermore, the use of the pedals by the performers to interact with the score is visualized as a kind of feedback to show them that the software recognizes the pressing of the pedal. This is done with red or green frames around the symbols.

The general layout is a split-screen, as for example employed in non-networked multiplayer video games. In such games, each player has their own active game screen in one of usually two or four divisions of the screen, but he/she can also see what the other players are seeing and how they move in the game. Popular examples of games using this feature are the go-kart racing games of *Super Mario Kart* and *Mario Kart 64*, allowing two respectively four players to play together using one screen. The fact that in 3x3 neither two nor four but nine players share the same screen has further implications, because the size of each field is rather small and the all the other fields are also visible to the players. This primarily means that the amount of information given should be limited, resulting in displaying mainly single graphic symbols, while additional information like the visual feedback of the pedals use a different type of graphical elements, which are colourful frames. For the programming realisation of the split screen, *Jitter* already offers an ideal object for this purpose called *jit.glue*, which has inputs for image or video matrices of a defined number of rows and columns (in my case 3x3), and outputs the combined or "glued" video matrix.

4.7. Combination of Semi-Random Structures and Fixed Sequences

The durations of the cues for performers, the playing modes which are active in a given moment and how these changes, follow two alternating or interleaved methods: semi-random structures generated in real-time and pre-determined sequences.

The semi-random structures are generated by separate modules for each playing mode that randomly pick one or two players for the next cue among the players that are not active at the given moment. As shown in figure 9, there is only a limited number of control parameters: the "on-off-state", the number of players (either one or two), the rate of player changes in seconds and an optional proportional duration (only for Imitation and Opposition Mode).

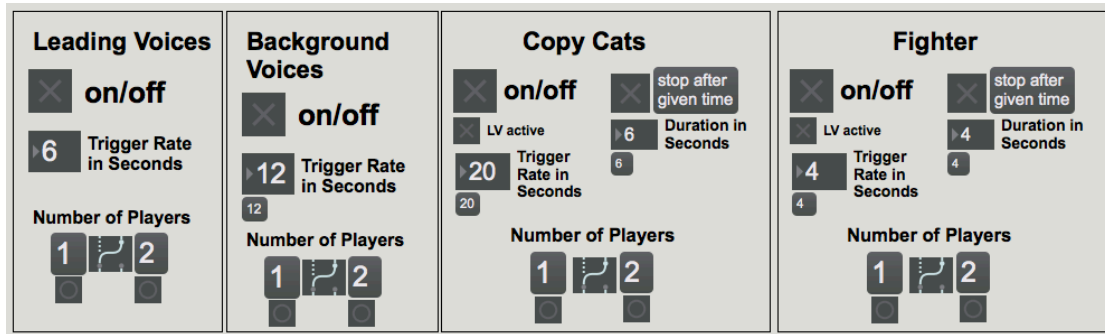


Fig. 10 – Control Interface for real-time generated semi-random structures.

I call the resulting structures semi-random because their character is shaped by these limited control parameters and the limited range of their values. This limitation is most obviously represented by the limitation to only two players per mode. The durations of single cues vary between few seconds and about one minute. The values and "on-off-states" of these parameters are saved as presets, which are sequenced by the *qlist* module. It includes a list, in which the succession of these presets and their durations can be fixed (see Fig. 10).

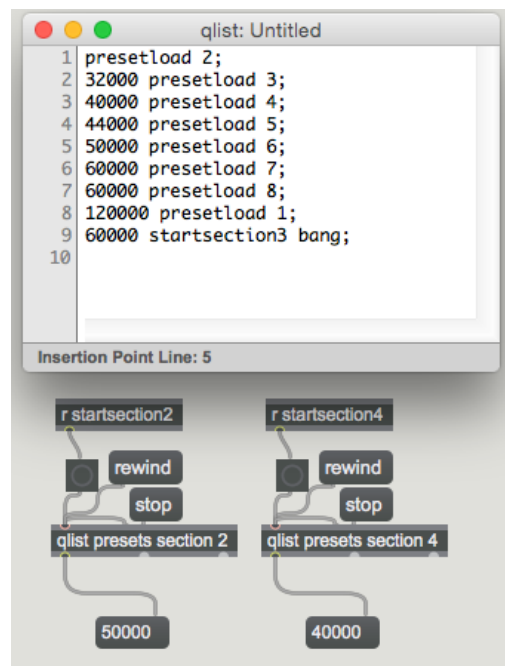


Fig. 11 – Example of Preset Sequence.

Fixed sequences are used to compose specific developments and progressions of playing modes and the number of active players. Also specific rhythmic structures, changes and rests can be realized easier and more precisely than with the semi-random generators and their preset control. Technically these fixed structures consist of text files incorporating lists of number with attributed indexes, which are processed by Max/MSP's *dict* object.

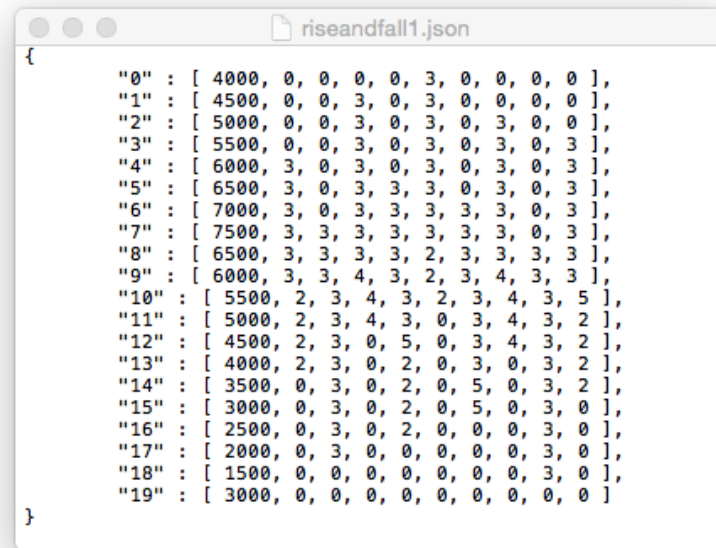


Fig. 12 - Example of Fixed Sequence.

Figure 11 shows an example of such a text file. The first of the ten numbers in the brackets indicates the duration in milliseconds of this screen situation. The other nine numbers represent the fields on the screen for each single player. A zero value represents a blank field and an inactive player, while each non-zero value represents a specific playing mode.

The given example shows a sequence used in the first performance. It was used once in the shown original form and was repeated as a "rotated" variation with the same development of modes and same durations but assigned to different players. The development follows a symmetric arch form. One player starts in background mode and others follow gradually. A kind of climax happens from the indexes 8 to 10 when all players are active and single players change into imitation or opposition mode. Following this phase one player after another turns inactive until a rest of three seconds happens. A number of such low-level

sequences can again be sequenced on a higher level by another *dict* object processing a list of sequence files that contain the low-level sequences.

If a performer is pressing his pedal to "reject" a cue that arises from a fixed sequence, he is "taken out" of the current sequence for at least 20 seconds. It is possible that he then enters a "semi-randomly" generated cue after a break of a minimum of 10 seconds. Semi-random structures and fixed sequences can also be interleaved to combine planned processes with the moment of unpredictability and surprise. On the software level this mainly works in the way that only few players are active in a fixed sequence, which get filtered out of the "lists of available players" of the semi-random generator.

4.8. Compositional Process – Development, Problems and Abandoned Ideas

4.8.1. The Beginning

I decided to place the following paragraph after the documentation of the piece instead of before, so that the reader can better understand the issues that relate to the concrete components of the piece. At the very beginning of the project, I had only vague ideas about what I wanted to do, but these ideas pointed towards something very different compared to what my work developed into. In my initial project proposal I planned to make a piece for a single performer with computer. The number of performers grew from one to three or four to finally nine. I wanted to employ many different materials and tools, that I discarded one after another, for example combining different forms of musical notation (traditional, graphic and text), using audio content analysis of the musicians' instruments for the interaction with the rules of the "game system", or integrating pre-recorded material. I spent much time implementing different mechanisms in *Max/MSP*, many of which did work on the software level, but were based on strongly questionable assumptions about musical and performance-related implication.

I was often struggling between different and often antagonistic intentions and strategies, sometimes having difficulties in setting priorities. On the one side I wanted to make a game piece in the sense of designing a game and in this vein making the game fun and interesting, yet keeping the rules simple, believing in the credo that beauty in a game can arise from simple rules and complex outcomes. On the other side it is primarily a piece of music to be performed, and I sometimes had to remind me of this and leaving the mindset of "game design".

From an early moment on, for me it was clear that I wanted to employ a kind of screen score for the musicians. But my first plan was to use laptop computers for each performer, thinking about four performers, and building a network to send data between them. There are two mutually supportive reasons why I abandoned this idea. Firstly, I wanted to avoid an overly complicated technical setup. Building a network between four computers for every experimenting and rehearsal session, probably with different computers each time, would have made complications very likely. Secondly, I became aware that the piece should in some way deal with group behaviour and dynamics, even though my ideas were still vague, in what way these aspects should be treated. I finally tended towards a larger number of performers to explore this element.

During the composition process a number of workshop sessions were held with changing small groups of musicians to try out ideas and get feedback. These sessions started with experiments in guided or conducted improvisation, trying out elements of *Cobra*. Another important source of advice and feedback along this process were the meetings with my mentoring teachers Gabriel Paiuk and Richard Barrett, as well as with Johan de Kreij, whom I consulted about programming problems with *Max/MSP*.

4.8.2. A First Performance and the Consequences

A first performance of a simplified version of the piece took place on April 15th 2017 at the Research Concert Cycle in Studio Loos, Den Haag. It was performed by Laura Agnusdei (tenor saxophone), Riccardo Marogna (bass clarinet), Abel Fazekas (E♭ clarinet), Volkan Turgut (trumpet), Jacok Lodico (recorders), Orestis Willemen (electric guitar), Reto Weiche (guitar), Vladimir Vlaev (guitar) and Annick Odom (double bass) and mixed by Michele Abolaffio.

The simplified version was missing the use of the pedals for the performers because of technical problems encountered at the final rehearsal on the day of the performance. I also had to take out sections that depended on the use of the pedal, which made the piece a bit shorter, leading to a total duration of about 20 minutes. Before the performance started I gave a short introduction to the piece, explaining the meaning of the symbols and also giving insight about the missing function of the pedals.



Fig. 12 – Performance at the Research Concert, Studio Loos, Den Haag on April 15th 2017.

After the performance the audience – which consisted to a big part of composition students – had the chance to give critique and comments or ask questions. One audience member commented that for her it was exciting to follow the video-score not knowing how it would develop and when changes would occur and to observe how the musicians react to it. They also mentioned that the visual part – though it was captivating – was reduced enough to not distract too much from the music – a danger I was aware of and tried to avoid by the design of the screen score.

This confirmed my observations and made me think about changing the way of the intended, but absent pedal use and its visual feedback with green and red frames around the performers fields on the screen, which would have made the overall visual characteristics more turbulent and could have led to an sensorial overload for both performers and audience. At the very least, I would make these frames thinner and the colours less bright. My considerations about changing the use of the pedals were enhanced by my observation of the performers during the piece. These additional tasks would be probably too much to concentrate on simultaneously, and would undermine the musicians' ability to react quickly.

Some players mentioned that often the rate of change of the visual cues was too fast to react and that cues were often not long enough to develop musical ideas further. With regards to the first of these complaints, my compositional motivations may actually be quite opposed to the idea of making all the cues comfortable to play - I want to challenge their skill and reactions to fast-changing cues until they reach their own performative threshold, at least at moments. I identified these moments of overload and confusion in the performance as having a certain attractive tension, which might be comparable to the stated tension of expectation in Wolff's *Duet II*. It is, however, important for me to limit these moments of overload and keep them in balance with sections of longer durations. In these sections of longer durations more elaborated or developing parts are encouraged.

In fact, during the compositional process I planned and tried out different ways of giving the musicians either signs for a forthcoming change (which would set the performers in an a state of what I called "attention mode"), or visually indicating the durations of cues.

For different reasons and for both options, the implementation in the software and a consistent use in the piece were problematic. In an earlier version, I implemented a visually well-integrated and appealing clock, but at a later state it badly interfered with other important mechanisms of the software, so I left it. Although some musicians at moments wished to have this function back, I was actually happy about the version without it because of the tension of anticipation and the moment of surprise it created. Thinking about what alternative ways might prevent this tension from becoming perhaps too stressful for the performers, I decided to introduce a way to rest. It can be seen as a kind of compromise towards the performers: I keep it challenging for them by not showing a clock or advance notice of changes. But instead I introduced the "blind play" with sleep masks, which detach the performer from the screen. I also decided to make longer pauses between sections that add another rest.

Another issue which one of the performers brought up and which I consider a weakness of this early version as well, is that some sections of non-random pre-defined sequences were repeated with different players by permutation or rotation. These variations of sections were recognisable as such and thus their development was very predictable. They were originally based on the democratic idea to not favour single musicians, but to grant everyone a certain playtime and equal "chance" to play in different modes. I thought originally that it could be interesting to see how different players interpret the same sections. But although the interpretations were different, the formal development was too static. Although the idea of equal chances and playtime is still important for me, I will definitely try to avoid such predictable repetitions of structures, because uncertainty and surprise should be a prime characteristic of the piece. One way to prevent predictability in repeating structures I decided to employ is interweaving fixed and random structure so that they work in parallel. And more directly, I also want to simply reduce these simple variations in players and increase the variety in inner structure.

4.9. The Visibility of the Score and Questions of Empathy

Mauricio Kagel's indeterminate works *Diaphonie* and *Prima Vista* (1962-64) employ projections of slides depicting a combination of graphical notations, images, traditional notation and text, which are changed by an operator and reacted to and interpreted the musicians. Kagel's use of projected graphical notation represent an early predecessor to animated notation and screen scores (Hope & Vickery 2011).

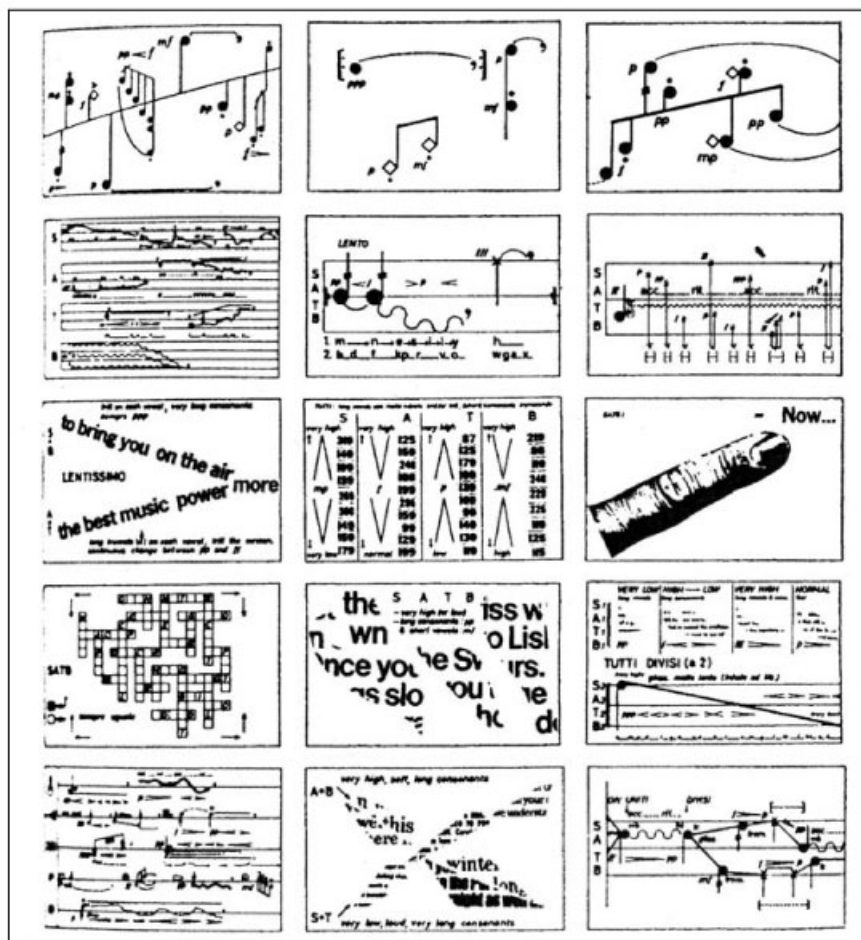


Fig. 13 – Slides from the score of *Diaphonie* (Broqua 2006, Fig. 2).

According to Bjorn Heile, "Kagel dramatizes the social nature of performance since the playing depends on the interaction between projector operators and performers, *Diaphonie* being premised on cooperation and *Prima Vista* allowing for disinterest or even sabotage", concluding that the notation's "raison d'être lies principally in providing an impulse for the social process of performance" (Heile 2006, 72).

Heile sees in the fact that the audience can follow the relationship between the score, the sound and the "ensuing social drama" "quite a radical empowerment" of the audience, also supported by the fact that skills in music reading are not helpful for most of the non-conventional notation (Heile 2006, 72-73). In his description of the performative quality of these pieces as "social drama", Heile uses a very similar vocabulary to John Zorn, who says *Cobra* is about the "psycho drama" between the performers. The "empowerment" of the audience, as stated by Heile, arises from the visibility of the score that allows the audience to relate the playing of the performers to the score.

In the case of *Cobra* it is not a score that is visible to the audience, but the audience can see the hand signs for "calling", the cue cards of the prompter and headbands of the guerrilla fighter, and maybe figure out some of the underlying principles. Similarly, also the cueing technique of Wolff can possibly be transparent to the audience by observing the performers' "body language" and listening to the relation of sounds resulting from the different cues. In a blog entry James Saunders wrote about how he is concerned about this possibility of empathy by asking if "watching and listening to people play music [can] communicate the experience of making it, and especially of making decisions in indeterminate music" (Saunders 2016b). In his short reply of this open question he affirms this idea, comparing the concert situation to watching a football game and the feeling of "kicking every ball" or the relatively new phenomenon of "e-sports" (Saunders 2016b), in which audiences watch video game competitions.

4.10. Evaluation of the Imagery of 3x3

In their article *Notational Semantics in Music Visualization and Notation*, Lindsay Vickery (2014) points to Moody's *Physics of Notations Theory* (Moody 2009), which gives central design principles for the evaluation and improvement of graphical symbols based on cognitive effectiveness and a defined design goal. Moody's propositions are originally aimed at software design, but can be equally applied to other fields and, as Vickery says, "particularly pertinent to creators of music that challenges existing paradigms" (Vickery 2014, 101). To analyse the use of graphical symbols in my screen score, five of Moody's nine principles seem to be especially meaningful: Semiotic clarity, perceptual discriminability, visual expressiveness, semantic transparency and graphic economy. The rest of the principles, which consist of cognitive fit, complexity management, cognitive integration and dual coding, will be ignored in the following because they do not apply in this case. These design criteria also interact, showing synergetic or negative effects upon each other. (Moody 2009)

The design goal for the graphical symbols can generally be described as effectiveness, meaning that the performers should be able to identify the graphical symbol rapidly and easily to be able to react to it immediately. Of course, having to react immediately to symbols representing more or less abstract instructions on how to improvise and relate to the other musicians is already a challenge. But it should not be made more demanding by "bad design". As the most relevant principles for the screen score of 3x3 I identify "perceptual discriminability", meaning that the symbols should be clearly distinguishable, and "graphical economy", which favours a limited amount of symbols to avoid cognitive overload. (Moody 2009)

"Visual expressiveness" indicates the extent to which range and capacities of visual variables like position, size, colour, brightness, shape or orientation are used (Moody 2009). The "visual expressiveness" in this case is very low. The symbols all – purposefully – share a basic similarity in their circular or concentric shape, while shape is still the main characteristic in

which they differ. Neither different colours, nor orientations or degrees of brightness are used. Still they seem to be simple to be distinguished individually.

The "graphic economy" is already fostered through the corresponding limitation of the number of instructions or modes that represents a central objective for the piece. Furthermore, each "semantic construct" or instruction corresponds to one symbol; in the terms of Moody this ensures "semiotic clarity", which in turn favours "graphic economy". The relatively reduced or calm imagery – which is here called "graphic economy" – is an important factor for my aim to minimise the distraction from the music by the screen score for the audience. (Moody 2009)

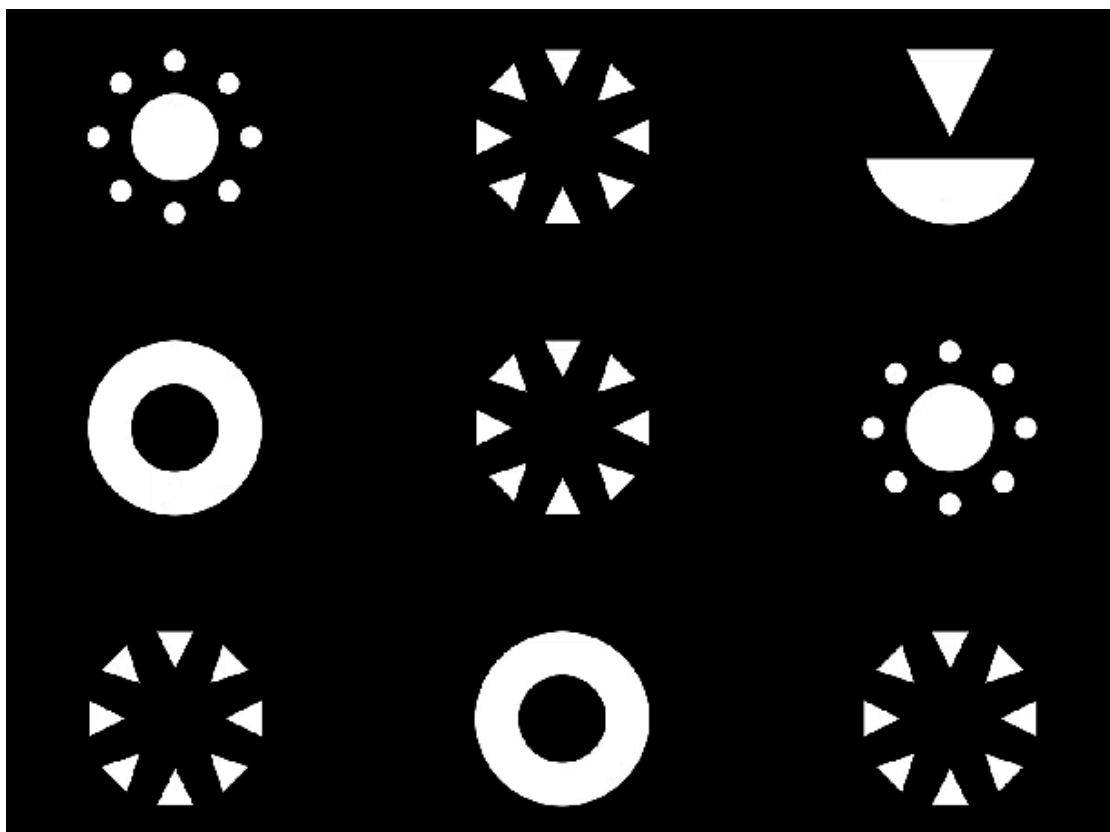


Fig. 14: Example of the Screen Score of 3x3.

I would also claim that the symbols' appearance is – albeit to different degrees – evocative of their meaning. This is what Moody calls "semantic transparency" (Moody 2009). The symbol for the background voice consists of small triangles arranged in a circle and pointing towards the centre. This periphery-middle relation evokes taking a lead and playing in the background. The fact that the centre is empty could be understood as indicating that the background voice – paradoxically – can also work autonomously without a foreground or leading voice. In a similar periphery-centre relation, the symbol for the imitation mode has a big filled circle in the middle, which is surrounded by eight small circles. The big circle corresponds to the leading voice, which gets imitated by surrounding voices bearing the same shape. The only asymmetrical symbol is the opposition mode. Its antagonistic character is further represented by two contrasting elements – a semicircle and a triangle. The symbol for the leading voice is the least suggestive. Compared to the background and imitation symbols it has the more filled space and thus appears brighter on the screens black background.

Feedback from musicians confirmed these claims of effectiveness and suggestive quality and attested a improvement in the graphic symbols compared to the earlier tests, in which free icons from the Internet were used. As the symbols for the "blind mode" and "free play" only were developed at a very late of the process of writing this thesis, they cannot be discussed here.

4.11. The Game Character of 3x3

I am arguing that 3x3 is both "playful" and "gameful". As particularly "playful" I identify the "blind mode" with his exploratory and experimental character and possibility to play free together with other players, but blind. The "blind mode" not only detaches the player from the screen score, but also suddenly prevents the ability of the audience to relate the performer's play to the screen, thus potentially creating awareness about this process.

Rules are a necessary condition for any game situation. The open character of most of the "playing modes" ("leading voice", "background", "imitation" and "opposition") not only allows different ways of interpretation by the performers, but explicitly encourages a personal and imaginative approach. I do not necessarily consider them as rules because of their openness. Only few definite rules can be identified in 3x3. One of these consists of the constraint not to play when the players' screen division is blank. This rule already marks an essential difference to free improvisation, in which only the performers themselves decide when to play and when not. It further introduces the possibility to make mistakes and subverts the commonplace statement that mistakes in musical improvisation do not exist. In games the unintentional violating of rules are considered mistakes, whereas the intentional violation of game rules is regarded as cheating. A performer that is intentionally playing when his screen division is blank is a cheater. Such mistakes and cheats can possibly be recognised by the other players and the audience through the score. But the possibility to "call" for "blind mode" should avoid the need to cheat in this way.

The "blind mode" also features binding rules: the player has to put on the sleep mask when indicated by the respective symbol and has to take it off when signalled by the sonic cue of the other performers. Other rules are written into the software, like in computer games that define the range of possible actions by the players. In 3x3 this is represented by two pedal functions. Both "free play" after "calling" and the blind players possibility to "turn off" the other players are limited in their duration by the software. On the one hand these limitations build a safety measure against excess, because both of these features act contrary to the rest of the piece in their own way. On the other side through their limitation and special function these features can be compared to game resources like a joker card. A joker is valuable, because he has power and because there is only one of it.

The instruction to react as fast as possible to the cues of the screen constitutes a task rather a rule. The moment of surprise and the tension created through the expectation of cues, and the need to react quickly, as attributed to Wolff's *Duet II*, equally applies in 3x3 and marks a central characteristic of its performative quality. Furthermore, like in *Duet II*, it also has musical consequences. For example, when two or more players get a cue in the same time,

they will usually not start to play at the same time but have different reaction times. In detail, the challenge of reaction is different though, because the performer does not know when a cue comes, as it is often based on randomness, pointing towards *alea*. Additionally, it is not only uncertain when a player will get his next cue, but also which playing mode this cue will demand. A certain tendency towards fast changes should provoke a constantly shifting situation and keep improvisers from entrenched playing habits.

Similar to Zorn's understanding of *Cobra*, the playing modes also do not only represent musical but also social relations and forms of power and control. While the blind player's mask already evidently alludes to *mimicry*, he represents a twisted role, being handicapped, but free in his play and powerful through his possibility to mute the other players. When no leading voice is active, he also becomes the source for imitation and opposition. Generally, the pair "leading voice" and "background voice" (resembling another pair, dominance and subordination) inevitably installs a hierarchy in the performance, which is contrary compared to the democratic spirit of free improvisation and its actual musical configuration. But this hierarchy can be broken by an imaginative use of the "opposition mode" and the possibility to change to "free play". Imitation mode "plays with" the usually claimed originality in improvised music and relates to the strange feeling of being imitated.

5. Epilogue

In the previous chapters it was aimed to investigate the point of intersection between games and music. It was tried to avoid adopting common generalist analogies and metaphors between the two, but to look at existing works instead. After certain basic terms and conditions were clarified, it was tried to prove the concept of "game pieces" with the help of examples by analysing their "game elements". The existence of rules, the player's agency and the uncertainty of the game's course are considered necessary "game elements", while others include skills, goals, obstacles, conflict, competition, chance and roles.

In "game pieces" the performer's agency to take actions and choices about musical material and structure gives him the status of a "co-creator" of the work, taking over control and responsibility over the outcome from the performer. As in games, the performer's actions and choices always require his acceptance of the rules, and often rely on his personal motivation and initiative. Similar to spectator sports, "game pieces" can open up ways for the audience to emphatically re-enact the "gameful" activity of the performers, for example by simple or transparent rules, or, when facilitated by visual elements like gestures, hand signs and cards, as in *Cobra*, or by a visible score, as in *3x3*.

All three discussed pieces show very different approaches to notation and openness. They do not meet the criteria for the mentioned definitions of games, because they do not lead to a quantifiable outcome or the players do not have a goal to achieve. But, as it was argued, all examples favour "gameful" activity by drawing on distinct configurations of "game elements". All three pieces demand specific skills that go beyond those traditionally associated with the performance of contemporary music and allow the comparison with games of skill. A particular game-like feature of *Duet II* consists of the possibility to make mistakes, which seems to be deliberately enhanced by the composer, underlined by a defined proceeding after their occurrence. *Duet II* and *3x3* emphasize the surprise created by the tense expectation of performers awaiting cues and having to react to it immediately. In *Cobra* the conflict between different individualistic intentions of the players, and their fight about the attention and acceptance of the prompter to enforce these, as well as the possibility to cooperate and play against the rules, characterise the game quality. Both *Cobra* and *3x3* allow the players to play different roles in relating to each, representing both musical and social relationships or hierarchies.

That certain "game elements" like goals or competition are not present in the discussed examples, does not mean that examples do not exist. These examples were in fact selected, because they are related to my practical work. Generally, the theoretical and practical parts of my research are not independent, but characterised by feedback and reciprocity. Zorn's *Cobra* was in fact a starting point and inspiration for *3x3*, at least in an early stage of its

composition. Though, this does it mean that I deliberately tried to adapt or take over aspect of this or other pieces, neither that I felt obliged to avoid it by any means.

This thesis only presents the current version of 3x3. As mentioned before as one aspect of flexibility as a personal guideline, the piece is not in a fixed state but open for changes and adjustments. My compositional process was strongly influenced by workshop sessions with musicians and I plan to continue to work in this way. As only the players make games possible, in the case of 3x3 the musicians determine the musical outcome for the a big part as "co-creators". I hope that the influence of game rules and playing modes on the imagination and possibilities of the musicians is more stimulating than restricting and that they accept the rules and playing modes as meaningful for the piece. Considering further development of 3x3, I want to try to find less hierarchical and less abstract playing modes, for example by setting up rules about responses to specific musical events. Also a further investigation of the possibilities of blind play as a way to set up an artificial situation, which focuses on listening and non-visual communication, possibly breaks with playing habits, and fosters unconventional techniques, seems fruitful for me.

In the introduction I mentioned that fun and playfulness as opposed to "serious music" might have built a starting point for my interest in "game pieces". About what causes the fun of games I still can just speculate. I suppose that fun in the end is highly subjective, but could for example be driven by the social encounter of playing games with others, the challenge imposed on the players, his freedom to take choices within the limitation of the rules and the uncertainty of the course and outcome of the game.

I believe that the joy of playing games also partly derives from the relation of the game to the world outside. Even though real-life consequences of games are generally negotiable and can also get out of the players control, as in gambling or video game addiction, most often games do not have serious consequences and are limited in time and space. One further reason for fun in games can be based on the fact that the player can act in ways, which are only possible or accepted in the game, and are often contrary to the norms and

laws outside the game. The fact that players can try out specific behaviour or playing certain roles in games constitutes their basic exploratory and experimental character. Playing games is thus an activity, in which playfulness and fun is not necessarily separate from serious activity and serious matters, as games also relate back to rules and roles outside the game.

List of References

- Bailey, D. (1993). *Improvisation: Its nature and practice in music*. Boston: Da Capo Press.
- Behrman, D. (1965). What Indeterminate Notation Determines. *Perspectives of New Music*, 3(2), 58–73.
- Brackett, J. (2010). Some Notes on John Zorn's Cobra. *American Music*, 28(1), 44–75.
- Broqua, V. (2006). Muésie et poésique aux États-Unis ?. *Revue française d'études américaines*, 109(3), 54–68.
- Caillois, R. (2005). The Definition of Play and The Classification of Games. In K. Salen & E. Zimmerman (Eds.), *The game design reader. A Rules of Play Anthology* (pp. 122–155).
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: defining gamification. In *Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments* (pp. 9–15). New York: ACM Press.
- Frissen, V., Lammes, S., de Lange, M., de Mul, J., & Raessens, J. (2015). Homo Ludens 2.0: Play, Media and Identity. In Frissen, V., Lammes, S., de Lange, M., de Mul, J., & Raessens, J. (Eds.), *Playful Identities. The Ludification of Digital Media Cultures*. Amsterdam: AUP.
- Gresser, C. (2010). Prose Collection: The Performer and Listener as Co-Creator. In S. Chase & P. Thomas (Eds.), *Changing the System: The Music of Christian Wolff*. Farnham: Ashgate.
- Haar, J. (1962). On musical games in the 16th century. *Journal of the American Musicological Society*, 15(1), 22–34.
- Heile, B. (2006). *The Music of Mauricio Kagel*. Farnham: Ashgate.
- Hope, C., & Vickery, L. (2011). Visualising the score: Screening Scores in Realtime Performance. In *Proceedings of Diegetic Life Forms II: Creative Arts Practice and New Media Scholarship*. Retrieved from http://imjournal.murdoch.edu.au/?media_dl=358
- Huizinga, J. (1949). *Homo Ludens. A Study of the Play Element in Culture*. London: Routledge.
- Juul, J. (2003): The Game, the Player, the World: Looking for a Heart of Gameness. In *Level Up: Digital Games Research Conference* (pp. 30-45). Utrecht: Utrecht University Press.
- Lange, A. (1991). Der Architekt der Spiele: Gespräch mit John Zorn über seine musikalischen Regelsysteme. *Neue Zeitschrift für Musik*, 152(2), 33–37.
- Moody, D. (2009). The “Physics” of Notations: Toward a Scientific Basis for Constructing Visual Notations in Software Engineering. *IEEE Transactions on Software Engineering*, 35(6), 756–779.

- Nyman, M. (1999). *Experimental music: Cage and beyond* (2nd ed.). Cambridge: Cambridge University Press.
- Rzewski, F. (1998). The Algebra of Everyday Life. In G. Gronemeyer & R. Oehlschlägel (Eds.), *Cues: Writings & Conversations* (pp. 10–16). Köln: MusikTexte.
- Saunders, J. (2016). *I tell you what to do: autonomy, control and play in game compositions* [Presentation]. Retrieved April 18, 2017, from <https://prezi.com/2opglgm-wkx9/i-tell-you-what-to-do-autonomy-control-and-play-in-game-co/>
- Saunders, J. (2016). *Values and motivation*. Retrieved April 18, 2017, from <http://www.james-saunders.com/2016/12/18/values-and-motivation/>
- Schiller, F. (2005). *Über die ästhetische Erziehung des Menschen, in einer Reihe von Briefen*. Retrieved from <http://gutenberg.spiegel.de/schiller/aesterz/aesterz.htm>
- Schwartz, E. (1993). *Music since 1945: Issues, Materials, and Literature*. Boston: Cengage Learning.
- Suits, B. (1978). *The Grasshopper. Games, Life and Utopia*. Toronto: University of Toronto Press.
- Sutton-Smith, B. (2006). Play and ambiguity. In K. Salen & E. Zimmerman (Eds.), *The game design reader: A rules of play anthology* (pp. 296–313). Cambridge: MIT Press.
- Thomas, P. (2010). Playing the Game? Five Reflections upon Performing Christian Wolff's Music. In S. Chase & P. Thomas (Eds.), *Changing the System: The Music of Christian Wolff* (pp. 211–218). Farnham: Ashgate.
- van der Schyff, D. (2013). The Free Improvisation Game: Performing John Zorn's Cobra. In *Journal of Research in Music Performance*, Spring Issue. Retrieved from <https://ejournals.lib.vt.edu/JRMP/article/view/726/1040>
- Vickery, L. (2014). Notational Semantics in Music Visualisation and Notation. In *Proceedings of the Australasian Computer Music Conference 2014* (pp. 101–112).
- Wittgenstein, L. (1958). *Philosophical investigations*. Oxford: Basil Blackwell.
- Wolff, C. (1961). *Duet II. Horn and Piano*. New York: Edition Peters.
- Wolff, C. (1998). In a Kind of No-Man's Land. Conversation with Cole Gagne. In G. Gronemeyer & R. Oehlschlägel (Eds.), *Cues: Writings & Conversations* (pp. 234–276). Köln: MusikTexte.
- Zimmermann, W. (1976). *Desert plants: conversations with 23 American musicians*. Vancouver: Aesthetic Research Centre of Canada.
- Zorn, J. (2004). The game pieces. In C. Cox & D. Warner (Eds.), *Audio Culture. Readings in Modern Music* (pp. 196–200). New York: Continuum.