IM-OS

Improvised Music – Open Scores

Issue 3, Winter 2020

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IM-OS, Issue 3, Winter 2020

Editorial

Third time! A new collection of open scores, and more thoughtful text.

A word about related audio or video materials: those who seek them are generally encouraged to search the net by themselves. In many cases there is good documentation, even if we see it as our prime task to make the scores available – which could be for your own, different versions, of course ;-)

There is no risk for the time being of us running out of material, but after the first issues reactions have been sparse. We would like, however, to hear some opinions from our readers. Especially about the scores it's all about and on what are the urgent issues of today.

Why do open scores matter? How were your most significant experiences? In terms of art and culture, what are we dealing with? How are we doing within concert and other institutions? Which compositional ambitions and challenges do you see? Etc...you are invited to consider this an enquete and to pass it on. Write us at im.os@gmx.com .

CBN

LINKING

80 cards

designed for Ensemble Dedalus dedicated to Tom Johnson for his 80th birthday

Samuel Vriezen, 2019

Components

Linking is a deck of cards with which many different musical scenarios (games or pieces) can be played. Not so much a piece as a tool for creating musical situations.

Every card in *Linking* has musical material on it, and the general instructions (below) determine when a player can begin playing a card. Since players will always have to try to enter at the same pitch (class) as another player, every distribution of cards creates its own possible set-ups for creating melodies that pass from player to player, or that generate counterpoint, or that may feature isolated gestures that can't be linked to other cards.

Linking uses a basic six-note scale, which gives the pitches at which links exist between cards: C, D, E, F, G, A.

The deck is structured as follows:

Sixty cards contain every possible interval from one pitch to another, once both in ascending and descending form. These form the heart of the deck.

Twelve more cards feature only one pitch. Six of these can only be played as a single note, but six also indicate an asterisk, which is a wild-card: any of the six notes can be played for the asterisk.

Finally, eight cards were added to create the eighty cards in honor of Tom Johnson's eightieth birthday. These cards contain three pitches and add some simple, occasional chromatic voice leading. These cards create a slight asymmetry in the deck's pitch distribution, since D and A appear both two times more than C, E, F, A in total.

(In certain scenarios, you might wish to remove some of these cards.)

How to play

1.0	You may play a motive from any card in front of you
1.1	starting to play when it is silent
1.2	or when the same pitch(class) is being played by another player
1.2.1	joining that player preferably at the unison, but occasionally (e.g. if the unison is not feasible) in another octave.
1.2.2	When joining another player this way, this is called a <i>link</i>
1.2.3	Links may be repeated, but only when the note linked to has itself been re-articulated.
1.3	If the motive is transposed to another octave, it is transposed as a whole rather than each note separately.
2.0	If you have more than one card from which to play, and two or more of them contain the same pitch,
2.1 2.1a	you might link them to one another treating each card as a separate action, each following the rules above
2.1b	forming longer lines (or, if your instruments allows, polyphonies, even).
3.0	When repeating a link, you may vary (tempo, rubato, phrasing)
3.1	trying to express the link or sequence of links together with the other(s) as a shared melody or polyphonic gesture.
4.0	An asterisk indicates any choice of c, d, e, f, g, a in any octave.
5.0	Mostly legato.
6.0	Do not dominate.

Example scenarios

Using the cards and the general instructions, various scenarios can be played, for example:

Simple Exploration for any number of players

a number of cards (say, 6-12) is dealt to all players, such that everybody has (almost) the same number of cards the players then explore the possible sequences then change the cards for new ones etc, until a set number of rounds have been played, or until it feels like it has been enough

Evolutions for about 7 players

players start with zero cards the first player takes a card sequences can be played (only by the first player, at this stage)

after a while, proceeding clockwise, the next player takes a card more sequences can be played etcetera, until all players have a card

after a while, the first player replaces their card by a new one (sequences can be played) proceeding clockwise, the next player replaces their card etcetera, until a predetermined number of rounds have passed

then players, starting from the first player, discard their cards one by one the game is over when the final card has been discarded

for more density, players may be allowed to have two cards (or even more, for small groups)

8

Growing Complexity Game

as above, but players can work with higher card limits no cards are discarded when everybody has a pre-determined number of maximum cards to play from, one by one (in clockwise order) the players will drop out the game is over when the final player stops playing

in this version, players are encouraged to find links among their own cards and repeat those

Building a Loop

(not using the 6 single note cards and the 6 asterisk cards)

as above, but players keep drawing new cards until a melodic cycle has been established that repeats all six notes then start again

(variant: a cycle that includes one card by every player)

Competitive Game

form a random deck of a predetermined number of cards (say, 4 per player) deal each player two cards the rest of the cards are put within reach of all players

when a player has at least three times successfully linked a card, joining another player, as well as three times managed to have another player link to the final note on the card, the card may be put aside in the player's private pile, and be replaced by a new one drawn from the deck

when a card must be drawn but the deck is empty, the game ends every card in a player's private pile is worth one point the player with the most points wins

Building Loops – strategy game for 4 or more players

(not using the 6 single note cards and the 6 asterisk cards)

players freely draw cards, up to a predetermined limit, maybe

4 players	_	3 cards
5-6 players	_	2 cards
7 or more players	_	1 card

players may replace their cards by drawing new ones

once two or more players establish a melodic cycle and have played it twice in a row, they will 'score' all **cards** that are part of that cycle, discarding and replacing those cards by new ones,

and scoring a number of points for each card, depending on the number of **players** in the cycle, as follows:

2 players	1 point / card
3 players	2 points / card
4 players	3 points / card
5+ players	4 points / card

(a referee decides when a cycle has been established, and keeps the score)

after a predetermined number of cards has been drawn, the game ends, and the player with most points winsSolo Puzzle

(play without the asterisk and the single-note cards)

form a deck of 12, 18 or 24 random cards draw up to seven cards play sequences then you may discard any cards that you managed to play as a link and draw any number of new cards, up to a maximum of seven active cards if you manage to get the entire deck discarded, you have succeeded

Collaborative Puzzle

(play without the asterisk cards)

a variation on the solo puzzle game

all players form decks of a predetermined number of cards two, three or four times the maximum as defined below

each draws up to a maximum number of cards:

2 players	_	4 cards
3 players	—	3 cards
4-5 players	_	2 cards
6 or more	_	1 card

play sequences

cards that have been successfully linked to other cards may be discarded and new ones drawn at any time up to the maximum

when all players manage to have discarded all their cards, the group has succeeded

MAKING A GAME FOR TOM

When Ensemble Dedalus's Didier Aschour asked me if I wanted to contribute a piece of mathematical music for Tom Johnson's 80th birthday, I immediately said yes, even though the word 'mathematical' did give me some pause. Perhaps with the exception of *Within Fourths/ Within Fifths*, a piano piece from 2006 that directly acknowledges Tom's influence, I don't really think of my music as 'mathematical' the way you can think of Tom's work as mathematical. Rarely do I write audibly 'logical' sequences or didactic performances. Rarely do I try to just get to the simplest and most naked exhibition of some combinatorial structure.

Of course, in my work I do apply a thinking that is honed by mathematics. Numerical structures and rigorous architectures are everywhere, but mainly as something that helps me figure out as precisely as possible what the piece needs to be, rather than as the subject in itself. Luckily, Didier also indicated that it didn't have to be 'mathematical', just a birthday piece was okay.

But Didier's question did make me think about what Tom's music means to me, and if I could somehow express it in my contribution. I've gone back to Tom's work often and in various contexts: there is of course *The Chord Catalogue* that I play and have recorded, but there's also his use of text, the self-reflective nature of many of his works, the way the music invites you to think along, without forcing you to (and in this I think there's something like an implicit ethics of listening, maybe even a politics of music). But just as importantly, the sense of pleasure, simple delight in discovery – and the sheer joy of playing something. (And how odd to think that this seems like a rare quality in contemporary composed music!)

In fact the unabashed presence of *play* may be one of the key things about Tom's work for me. To his music I attribute my insight into mathematics itself as a kind of social performance. If you read about the life of a mathematician like Paul Erdős, this is immediately clear: for him doing mathematics was a group effort, you question together, you think together, you marvel at the answers together. I don't think such activity is very far removed from the delight in simply counting that Tom's work exhibits, and that is often so infectious to audiences. The Italian movement of *Counting Languages* is an easy piece to get an audience to join in, without any prior preparation, and then you realize that counting is actually a fun collective exercise (until everybody gets their tongues twisted at the 'quattro quattro quattro quattro quattro duattro' bit).

Mathematics is play with rigor. But not only mathematics is like this. It also happens in another life-long interest of mine: games, especially games that feature a high degree of player interaction. Here, too, rules and discovery are key. A good game is a machine that creates exciting narratives out of rules for interactions. (Sounds a bit like chamber music?)

In 2011, Tom organized a ten-day tour through France with five younger composer friends on the theme of music and mathematics. It was a great week and a half, and I cherish the memory of working and discussing music and mathematics with Tom, Mike Winter, Brian Parks, Chris Adler and Steve Gisby. One topic that came up was whether you could consider my very simple game piece *Ensemble* as 'mathematical

music'. We decided that you could, because of the way the game rules structure it; later I presented my views on this at a conference in Mexico (at the invitation of Juan Sebastian Lach Lau) and wrote them down in a chapter of a Springer collection on music and mathematics, *The Musical-Mathematical Mind*.

Another recurring discussion during that tour in 2011 was about how Tom's music – and that of many of us – would often feature enumerations of complete sets. For instance, *The Chord Catalogue* is <u>all</u> chords within an octave. Often, these pieces would seek formal balance and symmetrical closure by being complete combinatorial structures.

A consequence of this is that their gestural scope is necessarily limited, and this in turn demands great musical rigor and awareness. If you want to present every single instance of some musical phenomenon, you have to define your musical parameters very clearly. You can only include the ones you're really interested in. Include too many parameters, and the number of possible combinations will just explode, your piece becoming impossible to play within anybody's lifetime. So you have to choose the expressive form very well, finding something that is musically interesting in itself, but that also stays fresh and lively in all of its, often minute, variations, sometimes across quite long stretches of phrase.

It now occurs to me that a (finite) game is also very much like that: a combinatorial structure of a limited set of moves, each of which are interesting and meaningful, by themselves, but also again and again in varying circumstances. In a good game, however, the possible combinations do explode quite beyond any player's ability to overview completely. This is what calls for taking risks and strategizing. It is how games achieve their sense of openness, even if the structure itself is, strictly speaking, closed. So the particular challenge in game design would then lie in how to make a game postpone the sense of its own finitude.

If list pieces, like the ones at which Tom excels, are 'small' combinatorial structures, then could game pieces be the natural setting for 'large' combinatorial structures?

As I mentioned, player interaction is another thing that interests me enormously. A recurring reference for me is Christian Wolff's *For One, Two or Three People*, which I look at in the book chapter mentioned above. From my experience with this piece I have developed an interest in cueing structures, and especially, in how they may generate musical form – almost like spontaneous creation. Cues are powerful musical resources, because they create interdependency and interaction among players. They keep players at one and the same time playing and listening, trying to see the whole and their own part in it, and make players at every moment in the piece responsible for its group timing. A clearly defined type of cue will shape the player's subjective state in playing, determining what they listen for and react to and how. At the same time, linking together various cues in specific ways can create larger patterns, musical form emerging from accretions of individual actions. So I wanted to try varying such cueing architectures. Given a certain set of admissible cueing links, what sort of melodies and counterpoints and phrases and mentalities might arise from them? And if you change the structure a little bit, how does that change what music might emerge?

Furthermore, I like the idea of simultaneous activity without a central point; I like the idea of a counterpoint growing from that; I like the idea of playing melodically together, forming webs.

All this led to *Linking*, one attempt to shape these ideas in a minimal way. It is just a deck of cards. The deck itself is a simple combinatorial structure: an enumeration of all possible transitions between six notes (with a few extra cards to get the full deck to 80 items, adding some spice to the bare structure). Yet the amount of polyphonic situations that could be generated by them number into the billions.

Linking then presents a set that can never be complete. Every performance of a game you could play with these cards will break the rigorous symmetry of the deck itself in one way or another, to explore just one singular set of musical possibilities. And you can play *Linking* employing many different sets of game rules. Below, I've provided rules for various games, some more like regular pieces, but collaborative and even competitive musical games could also be played.

Eighty cards, a closed and complete set, but creating open worlds, inviting connection.

GENERATED STRUCTURES

Taking only the sixty two-note cards as a starting point, any choice of such cards could be represented as a *graph*. This graph would have six vertices (points), standing for the six notes of the scale, and every card represents one transition which you could draw as an arrow from one note to another. In this way, every subset of the cards gives rise to a graph that contains all the possible transitions.

A path on this graph, linking together multiple transitions, is a melody.

A vertex that links to multiple other vertices is a point of potential bifurcation, where a single line might turn into counterpoint.

The total number of graphs is high: over a billion. Since any graph is isomorphic to at most 720 other graphs, this means that *Linking* features well over a million possible musical scenarios that are each, somehow, essentially different.

A graph that contains a cycle would correspond to a musical scenario in which you could keep linking melodic cells to one another, and keep playing ad lib. In order to intuit the emergent musical balances when coming up with game rules, I wanted to know what the chances are of such cycles occurring, given a certain number of cards in play. I wrote a C program to calculate this, and the results are shown on the next two pages.

Of course, since the full deck also contains the single-note and three-note cards, use of the full deck would lead to a somewhat different chance distribution. Still I hope the table will be useful if anybody should like to design their own games to play with the cards.

total #	A - A - I //	total # of graphs containing proper n-cycles				
of arrows per graph	of graphs	2	3	4	5	6
1	30	0	0	0	0	0
(chance)		0	0	0	0	0
2	435	15	0	0	0	0
(chance)		0.03448	0	0	0	0
3	4060	420	40	0	0	0
(chance)		0.10345	0.00985	0	0	0
4	27405	5565	1080	90	0	0
(chance)		0.20307	0.03941	0.00328	0	0
5	142506	46410	13860	2340	144	0
(chance)		0.32567	0.09726	0.01642	0.00101	0
6	593775	273455	111900	28890	3600	120
(chance)		0.46054	0.18846	0.04865	0.00606	0.00020
7	2035800	1212120	634800	224100	42840	2880
(chance)		0.59540	0.31182	0.11008	0.02104	0.00141
8	5852925	4205565	2681250	1217685	321120	33120
(chance)		0.71854	0.45810	0.20805	0.05486	0.00566
9	14307150	11744590	8737390	4897230	1690440	241680
(chance)		0.82089	0.61070	0.34229	0.11815	0.01689
10	30045015	26969943	22529544	15055539	6596124	1249020
(chance)		0.89765	0.74986	0.50110	0.21954	0.04157
11	54627300	51831780	46947120	36175200	19645200	4830000
(chance)		0.94883	0.85941	0.66222	0.35962	0.08842
12	86493225	84629545	80660055	69240195	45435090	14392380
(chance)		0.97845	0.93256	0.80053	0.52530	0.16640
13	119759850	118899690	116540880	107692560	82671120	33559380
(chance)		0.99282	0.97312	0.89924	0.69031	0.28022
14	145422675	145176915	144166005	139149165	120120090	61742400
(chance)		0.99831	0.99136	0.95686	0.82601	0.42457
15	155117520	155084752	154782576	152673096	142214040	90217524
(chance)		0.99979	0.99784	0.98424	0.91681	0.58161

total # of graphs containing proper n-cycles

16	145422675	145422675	145365420	144695505	140497980	105643800
(chance)		1	0.99961	0.99500	0.96614	0.72646
17	119759850	119759850	119754420	119591370	118336290	100482030
(chance)		1	0.99995	0.99859	0.98811	0.83903
18	86493225	86493225	86493035	86462455	86173080	78969670
(chance)		1	1	0.99964	0.99630	0.91302
19	54627300	54627300	54627300	54622980	54569640	52181400
(chance)		1	1	0.99992	0.99894	0.95523
20	30045015	30045015	30045015	30044595	30037035	29367891
(chance)		1	1	0.99999	0.99973	0.97746
21	14307150	14307150	14307150	14307130	14306440	14151640
(chance)		1	1	1	0.99995	0.98913
22	5852925	5852925	5852925	5852925	5852895	5825145
(chance)		1	1	1	0.99999	0.99525
23	2035800	2035800	2035800	2035800	2035800	2032200
(chance)		1	1	1	1	0.99823
24	593775	593775	593775	593775	593775	593475
(chance)		1	1	1	1	0.99949
25	142506	142506	142506	142506	142506	142494
(chance)		1	1	1	1	0.99992
26	27405	27405	27405	27405	27405	27405
(chance)		1	1	1	1	1
27	4060	4060	4060	4060	4060	4060
(chance)		1	1	1	1	1
28	435	435	435	435	435	435
(chance)		1	1	1	1	1
29	30	30	30	30	30	30
(chance)		1	1	1	1	1
30	1	1	1	1	1	1
(chance)		1	1	1	1	1











Radschlag



for a group of people Alexis Porfiriadis 2013

- At least five performers
- Form a circle
- Musically circulate (clockwise and/or counter-clockwise) the elements chosen. The elements to be performed should be chosen collectively prior to the performance. The resultant realization should be the product of a conversation between the performers and it should by no means be decided by one single person. Two different directions can be followed at the same time (i.e. clockwise and counter-clockwise) provided that a maximum of two elements (e.g. a note and a sound, a noise and an instrument, etc.) are being circulated.
- Vary the duration (short/long) and the dynamics (loud/regular/quiet) of the elements chosen. The only thing you have to decide collectively is the overall circulation speed (fast/regular/slow).
- "Circulation of an element" doesn't imply that everyone has to play the element in the same way. It is preferable that every one of you will find his/her way of performing every element chosen.
- There are no pauses between the circulation of different elements.
- If the duration of an element is 'long', the first player does not have to stop playing for the second to begin. He/she can continue playing for as long as he/she desires, until the last player finishes his/her performance of the same element.
- Similarly, if you chose to use the element 'melody', the second performer should not necessarily wait for the first performer to finish his/her melody. It is preferable to have a 'blurring' of melodies rather a 'lining up' of melodies.
- Minimum duration 7 minutes.



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Circulate

a hard noise a soft noise a beautiful noise a wooden noise a wooden noise a metal noise a plastic noise a glass noise a glass noise an unknown noise an electronic noise an everyday noise a natural noise a happy noise

a light instrument a heavy instrument a string instrument a wind instrument a strange instrument an unknown instrument a keyboard instrument a friendly sound an ugly sound a provocative sound a wind sound a trivial sound an experimental sound a sad sound a wrong sound a natural sound a percussive sound a string sound an anxious sound a meditative sound

a bourgeois melody a conventional melody an inquisitive melod an essential melody a political melody a conservative melody an entrenched melody a committed melody a private melody a transitory melody an unknown melody a strange melody a furious melody a sad melody a cruel word a sexy word an unthinkable word a provocative word a meaningless word a loving word a poetic word a religious word a political word an empty word a friendly word a musical word a funny word

a messy note an immobile note a falling note an ascending note an ascending note an European note an American note an electronic note an innocent note an innocent note an expressive note an expressive note a blurring note an essential note a soft note a historical note

> Alexis Porfiriadis, 2013 *Radschlag*



l'heure du panurge

Peter Schuback 2004



The twelve symbols are to be played as short fragments with pauses in between. Musicians choose individually where to start (which "hour" within the clock dial). The order is given, but musicians, 3 or more, do not need to synchronise. Choice of instruments is entirely free. All 12 statements are to be played after another, clockwise.

After the first cycle, that is, starting with the second cycle, one freely chosen fragment is left out for each cycle until there is only one left. Then one fragment is added for each new cycle. When all fragments are played again, that is, after the twenty-fourth cycle, musicians play their last fragment over and over again until all have arrived at the same stage in the process. Then the piece is over.

Game pieces as games - part 2

Editorial intro

"Game is in balance where it doesn't tend to a single scenario", Adam Wasążnik wrote in the first part part of the following article about game related theory and its possible application to music. Games should be able to surprise us, it appears. Improvised music may also surprise us, both when it is freely improvised within a loose concept and when players are following experimental scores. The author uses the notion of "game pieces" in a broad sense, potentially covering both music forms.

Take a look at those concepts discussed below:

- #1 Fairness
- #2 Challenge vs. Success
- #3 Meaningful choices
- #4 Skill vs. Chance,
- #5 Head vs. Hands
- #6 Competition vs. Cooperation
- #7 Short vs. Long
- #8: Rewards
- #9: Punishment
- #10: Freedom vs. Controlled Experience
- *#11: Simple vs. Complex*
- #12: Detail vs. Imagination

Going through them one by one, what could each have to do with the motivation for playing music in your opinion? And if you are a composer, which attractions are you offering players?

CBN

Game pieces as games - part 2

by Adam Wasążnik

In *Game pieces as games – part 1* (IM-OS, issue 2, autumn 2019) we presented introductory remarks on the newest history of game related expertise and used terms. The main topic of the current article is **game balance**. As a technical term in gaming it is commonplace and is of interest to players, designers and game scholars alike. Let's explore how this notion may inform music-making, especially improvised.

Jesper Juul in his systematic book that provided us with definitions for part 1 describes balancing as "tuning the relation between different weapons, units, or sides of a game" (Juul 2005: 207). As with many terms from game design, the exact contents of the term is less important than successful practical application. We can accordingly imagine the task of "Game pieces as games" as a tutorial on what to do to make a balanced music game. This might be the basic mode of writing, but connections between game balance and game pieces are hoped to be shown in the process as deeper than only practical.

In the article we will put the notion of game balance in the context of game related thought and define it. Then we will dissect a wide understanding of the term and examine the parts that we excluded from our narrowed down definition. The following chapter will examine for whom game pieces are. At last we will follow the typology from *The Art of Game Design* by Jesse Schell (2008) and apply different balance types to forms of guided improvisation.

Definitions of game balance

Although the term is used abundantly, the exact definition is most often omitted and individual takes on the term differ. In *Game Design Architecture*, chapter 5, "Game Balance" (Rollings, Morris 2004: 105-140) the topic is directly connected to the **beauty of the game** and is elaborated in separate aspects:

- (1) player/player (balance as fairness),
- (2) player/gameplay (learning curve in the game),
- (3) gameplay/gameplay (elements of the game balancing each other).

As the book is a very practical approach to video games creation (whereas game pieces have more similarities with board games), balancing is mainly treated as a stage in a development process. It indeed is, both for board and video games, and is usually placed rather towards the end of it (close to testing). However, balance of the game should be taken into consideration throughout all stages.

In different wide and narrow understandings that are in use, the (1) – player/player, balance as fairness, is a core that belongs to all definitions, unfortunately, in its basic form it will not be very useful for music games as it is related to winning and losing. In competitive games when one of the sides tends to win more often than the other, the game is imbalanced and it is usually considered a heavy drawback of the game.

Nevertheless, let's look at Chess where White wins more often than Black according to accumulated official match statistics. This shows that imbalance is not binary and when slight it isn't game-breaking. As long as players feel that a game is worth playing on a disadvantaged side, it's OK, and you can still find players that prefer Black. In Go the first player advantage is compensated with *komi* – additional points given to White (in Go it's the first player playing with Black). Since its relatively late, 20th century introduction to Go there are ongoing discussions about what is a "fair" *komi*.

But the imbalance of the very sides of conflict isn't the only nor main. When looking at a game you might find specific elements (strategies, moves, virtual or imaginary items) that give so much advantage that players choose a considered element any time they have a chance. It's like they have no choice.

Connecting balance with proper amount of restriction on choice is done in the book *Rules of Play: Game Design Fundamentals* (Salen, Zimmerman 2004: 210). Interestingly, here it's noted in the context of system theory. In this model we want to examine not only the amount of choices a player is given, but also the influence that the choice will bear on a game state.

Brian Upton introduced the distinction between *horizon of action* and *horizon of intent* (2015: 47-49), first is related to actual possibilities (system) and the second takes player's perspective into consideration. In this context we can see that systems approach of Salen and Zimmerman undervalues both individual perception and the time factor. There is not much use of a choice that is technically given, but always overlooked due to different pressures or subjectivity. Such choices have a place in a game as they add depth, but balance should rather not be based on them (see also later in the section about balance type #3: Meaningful Choice).

There is some general confusion as for what is the essence of balance, what are the effects of balance and what are the means to achieve a balance in the game. The definition for the following chapters is an approach from the opposite side than those above, but it should be useful both in context of improvised music and practical applications: *The game is balanced if it doesn't tend to a single scenario.*

The definition reflects the broadness of the term, as the scenarios can be considered at many different levels. The definition covers balance aspects of player/player (the scenario of one side winning) and gameplay/gameplay (usage of some element of the game). The definition is usable in single-player and cooperative games.

Games targeting

We are not to ignore the understanding (2) – player/gameplay. We already discussed in part 1 to what extent we can treat performing experience as the main result of engaging in a game piece. How the player engages with the game is extremely important. But we will treat adjusting the learning curve not as a technical use of the term "game balance" but as a use of rich metaphorical connotations of balance in general, thus excluding it from our definition.

The player/gameplay interaction needs to be examined now more closely. First, let's see how the topic of target audience typically works with board games. When the designer considers the group of potential players, he or she firstly might focus on a basic player dichotomy between "casual" and "hardcore" gamers. Games are now a popular hobby and more and more people spend a lot of time with them, develop a collection of games and gather knowledge about titles and trends.

This group is much more critical toward cliché solutions used in design (like "roll a dice and move" from Snakes and Ladders) and at the same time players from this group are willing to spend much more time with a game including also the time even before playing, spent to learn the rules in hope that the playing experience resulting from it is then worth their earlier effort. In extreme cases, especially with simulation games or complex wargames you can treat first playthroughs as rehearsals!

The subdivisions of intended audience-performers of a game go deeper than hardcore/casual and involve age groups (both for learning pace and themes) and context of usage, which informs time lenght for the game, difficulty, style or the allowed amount of players. Here the popular category is a "party game" for many players (>4), rather short (<1h and much shorter) and preferably with a light theme and social interactions between players. Close to the other end there is a 2-player, strategic, lengthy game for a much different intended user base. As special cases, let's also list games with a very specific target, developed for educational or training purposes.

There probably is no game idea that could fit any potential player, a game is intended to be played by as many players as possible for what the given concept allows. Hence, unnecessary complication is the number one enemy. Indeed, many music games used in classical music, jazz or other styles that are used as didactic devices are usually extremely simple, unfortunately sometimes down to the point of being uninteresting themself and serving their purpose less effectively.

It is worth noting that game balance proper is in contradictory relation with the widening of the target described in this chapter. Examples might be seen at many levels, but it's easy to recognize that including the rule to the game is a straightforward way of providing additional choice to players if needed, yet every rule adds complication and increases the entry threshold. Same with smaller adjustments where you might for example find a perfect balance with a value 2.531. But such a precise number instead of 2 or 3 is harder to remember which might contribute to overall difficulty.

Experimental popular music

Experimental music is diverse, but it might seem that this sort of appeal towards a wider audience that was implied in the previous chapter is not in its spirit, but we can find examples that suggest otherwise. Rzewski's "Les Moutons de Panurge" combines demanding parts intended to be played by professional musicians with easier parts for non-musicians. A quote from "Draft Constitution of Scratch Orchestra" by Cardew (1969) shows how this "group of enthusiasts" intends to perform "Popular Classics". [A] qualified member plays the given particle [voice, page, a gramophone record, etc.] while the remaining players join in as best as they can, playing along, contributing whatever they can record of the work in question, filling the gaps of memory with improvised variational material.

This could easily be more demanding... For a last example let's look at a statement from Michael Pisaro (2009) when he analyses the notation of pieces by Christian Wolff:

Another feature of these prose pieces is that nearly anyone can do them. The entry level, in terms of the amount of previous musical training or technique one might need to perform it, is, compared to most classical music, quite low. It is usually possible to use sound sources that are available to just about anyone: the voice, everyday objects or some kind of simple instrument. The score also makes it possible, in most cases, to produce music right away.

So it seems that as for performance the movement toward extending the participation is strong. Hence, we will again treat game pieces just as we would treat other games and we will assume that the more players can have a go at the piece the better. As we have shown this is appreciated both in experimental music and in other approaches to music games. As the previous chapter stated, such an aim will make it harder to find balance in game pieces.

Balance in game pieces

For a closer look we now will turn to game balance typology presented in *The Art of Game Design* by Jesse Shell. For our topic the book is especially useful because the author (experienced game designer) addresses diverse types of games (not only for a computer) and in the chapter "Game Mechanics Must be in Balance" (Schell 2009: 171-205) described in detail 12 types of balance. Not all will fit our definition as Jesse Schell operates with a wider understanding of balance, but all might be of interest to creators of game pieces. We will list all types in the order presented in the book and will more closely analyse some of them.

#1: Fairness

The first category applies only to multiplayer games. Although it is not the greatest of lenses to apply to music, Schell analyses it in a useful context of symmetry. Implementing differences between sides in a regular game requires substantial effort from the designer, so symmetrical organisation is there a natural state. It's not so in game pieces due to differences between instruments. You can make music games for specified families of instruments, but a desirable directive "for any instruments" implemented reliably is hard to come by and is misleading if you want to work with sustain or pitch for example.

The parameters that seem to be musically the most universal are **density** (how many players at once) and **duration** of a musical event (we return to this topic in #7. Long

vs. Short). Yet, both become not so clear-cut when we consider electronic instruments capable of staying right at the edge of perception or generate music when unattended or operate mainly by transforming other sound sources.

To apply fairness it's useful to soften the criteria of "success" in the game, not stay just with winning/losing. Then we can see that "unfair" might be letting some players influence the gameplay less or otherwise make their participation constrained due to limitations of the instrument.

#2: Challenge vs. Success

This is for single-player and cooperative games, so it's fitting for game pieces as competitive elements are relatively rare here. It seems that most results from regular games will not be of much use to us, because the game part is not a main source of challenge in game pieces. Rather the difficulty of music games is that there is a game and music-making **at the same time**.

Main focus for us will be two last of five tips from Jesse Schell provided as follows:

- Increase difficulty with each success
- Let players get through easy parts fast

- Create "layers of challenge" [which work by using simultaneous criteria of success, first for meeting some of them, and for meeting all of them by experienced players]

- Let players choose the difficulty level
- Playtest with a variety of players

Letting players choose is a method used often in music games, maybe even too much and maybe for wrong reasons. Sometimes for a music game many variants are suggested and players might be encouraged to mix and match rulesets. It might be that actually the reason for it is that the game was... not playtested with a variety of players, so the game designer doesn't know what works and what doesn't.

Another (again inglorious) reason might be that it is an attempt to claim ownership over any possible game created using a mechanic described in rules. It's a striking cultural difference between the disciplines, because in game design, the central mechanic of a game decides on its genre. New genres of games appear even more often than in electronic music.

#3: Meaningful Choices

There are some classical examples of pure-chance games like a Goose game and it's many spin-offs, but most games give players some choices. In game pieces players always have choices to make, however, in this section we will not refer to all of them, but only those that change the game state (explained in part 1), whereas many choices influence only the music that is played. According to Schell a choice is meaningful having two features: it is influential, and there is a proper amount of alternatives.

As for influence, choosing if you play with a "shoe" or a "hat" in Monopoly has no gameplay consequences, so it's an example of an illusive choice. Another "trap" in balancing the game is to provide choices to a player but clearly undesirable. If nobody chooses an option it doesn't contribute to diversity of playthroughs.

The proper amount of choices is impossible to determine apriorically as it always depends on the context. Players' perception is key here: if there is too few choices, players will feel frustrated and if there is too many, they will feel overwhelmed. Schell suggests comparing choices with desires of players at the given stage of the game.

One additional feature of meaningful choice I think should be here added is that a truly meaningful choice is informed, unless you really want to explore the topic of blind trial and error with your game. Possible consequences should not be a total mystery.

According to Schell one type of meaningful choice is especially important. He calls it "triangularity" but it's more known as "risk/reward". It's when players are given a choice between a safe play for a small reward and taking risk in hopes to gain more. Risk here is not just randomness, but rather uncertainty and Schell finds this mechanics in all successful games, even in Chess.

"Musical Tetris" by Marcus Staniec has a visible "risk/reward" mechanism. The original, difficult variant lets players take turns to enter one note per turn at an unoccupied place in the two-bar ongoing loop. In a game there is a safer strategy to put new notes from the start of the bar one after another. If all players follow it, they can shape the final result by choosing other parameters of their entries, but the musical result is drastically less interesting. An evolution of the piece where new sounds are interweaving with a previous pattern is much more satisfying (provides a bigger reward).



#4: Skill vs. Chance / #5: Head vs. Hands /#6: Competition vs. Cooperation

The basics of these three categories are described as something to be purposefully shaped. These are included in the scope of the extended balance as player/gameplay interaction. In any case the game might land on a different place in the "versus" spectrum. Providing a mix of Skill and Chance is recommended by alternating on a small scale, by throwing a dice (chance) and choosing a direction of movement (skill) etc. Head and Hands are used simultaneously and focus on them might be interchanged not as often. Competition and Cooperation are conveniently combined for example in the form of teams.

For now, all of these options seem to be underused in game pieces, so this is one of the areas left open for future developments. A music game tends to be just about skill or clearly aleatoric, but at least instead of chance, unpredictability is considered important. Some game pieces are challenging intellectually while others are devised as a way to escape the unwanted domination of the "head" (notice the metonymy, "Breathing Instructions" by Frederico Pozzer from last IM-OS works as "hands" too). All three categories get in the scope of balance as understood here, if it is decided that players can use these different approaches as options in their attempts. Then balance would mean that all of them seem attractive enough to players to be not excluded from use. So far the most potential lies with Competition and Cooperation.

The term that is now used for a game that can be played cooperatively and competitively during a single playthrough is "co-optional game". It's a relatively new type in video game design, and for a co-optional game to work players need to stay engaged by proceeding from one exciting task at hand to the next without too much focus on overall goals of the game. Time pressure and dexterity testing are great contributors to the approach, to make sure that both types of interactions appear you need to provide a lot of opportunity for each.

It would be very hard to implement co-optionality with board games, and for computer games, balancing is not easy. But, surprisingly, it is actually the natural state of some music games where during improvisation players can easily cause some difficulties to each other "in good fun" or in the hopes of making better music. The situation in this regard is quite close to theatrical improvisation games. Making both competitive and cooperative options realized might need only some verbal encouragement.

#7: Short vs. Long

We come back again to the topic of duration, and stray away from Jesse Schell's remarks for a moment. As the topic is as important for music in general as for games, this section is more comparative. We treat here the duration as a parameter, but we need to beware the readers versed in parameter domain about possible confusion: in the systematic overview of musical parameters by Bergstrøm-Nielsen (2006) what is useful for us (the length of the event) has just a short mention as an additional understanding and the focus is rather on the duration of individual sounds.

Game pieces that play around duration of parts ("when you play and when you stop") are closely related to games about constellations ("when who plays with whom"), and this type of a game is notable for being successfully "for any instrument". It is achieved by avoiding any musical directions regarding performers' material. In this group there are early games of John Zorn (like "Archery") and also for example Jennie Gottschalk's "Imagined Seconds" where the length of solo entries is measured and compared with earlier guessing. Amusingly, the duration of this game as a whole is a dare, because it is marked as "for any number of players" who play consecutively, so it could last a year.

Single-player computer games may allow saving and reloading, so players can have breaks in their attempts at the game. Speedrunning communities form around many titles where players try to play as fast as possible using any available trick. Some elevate their skill to incredible levels, contributing to sort of a spectator e-sport on its own (summer 2019 event of Games Done Quick raised \$3 millions in donations for Doctors Without Borders). With that the span of playing times for a single playthrough might be huge, for example in "Dark Souls" game, the average 50 hours for first completion goes down to about half an hour world record. In classical board games the necessary and average playtime might be also diverse. Mind sport approach used to be to play long games (hours sometimes split on separate days) now it is rather to play with a timer to limit this excess. But in modern board games the time of the game tends to be more and more controlled (by the set number of turns, sandclocks...), often being featured on a game box together with a number of players and age range. The reason for it is practical, probably two most popular ways of playing is at home when a game is fitted into a free time schedule or during the events where there are more people playing simultaneously and then swap places. Both modes benefit from available information about the expected time of the game.

In game pieces, strong influence over the length of the piece seems to be often appreciated as it is significant for a musical result. Modes of performance also don't favor so much the restrictions over the duration. It is much harder to organize events where a few music games are played simultaneously, there is more practical gain in having games flexible as for the number of players participating.

The designer's indirect control over the length over the piece makes a game playable for a larger variety of players. Probably the best result would be making the duration expandable and contractible with players actions, but introduce some mechanism for naturally tending to a set length. It is good for players new to improvisation – a decision on when to end might be one of the hardest to make in free music and if the game extends too much, it's discouraging for players to play it again. But hinting at the ending might be useful also for experienced improvisers coming from different backgrounds. Game pieces are of interest to improvisers with a classical upbringing and those from contemporary/popular scenes. As for points of reference, the shortest symphony is (probably) longer than the longest hardcore punk song...

#8: Rewards / #9: Punishment / #10: Freedom vs. Controlled Experience / #11: Simple vs. Complex / #12: Detail vs. Imagination

Basically these types of extended balance belong to a player/gameplay category. These are quite arbitrary dimensions along which you need to shape a game – and I'd like to stress, that also game pieces can be analysed with the same categories. The one exception that might not be useful during the creative process would maybe be #12: Detail vs. Imagination that is related to narratives and simulations quite rare right now in music games.

Even if types #10 and #11 don't outline the spectrum along which we try to differentiate gameplay they are strongly connected to balancing as they are changed with every decision in the process. There is a neat analogy concerning the saying that a video game is between movies and real life and should provide agency in comparison to movies while getting rid of tedious tasks abundant in daily life. As for control, open composition is similarly on the spectrum between free improvisation and classical music and should provide the best of both worlds. Game pieces are again in the middle of the pack between graphic scores and modular notated open pieces.

Schell comments on #11 by distinguishing *innate complexity* (complication of rules) and *emergent complexity* (complexity of gameplay) pointing to Go as an example of a game with low innate and high emergent complexity. He also introduces two categories: Elegance and Character; these are indirect opposites visible in different scales. Character stresses the game's identity and makes it likable; it may effect from a short creative burst. Achieving Elegance might be considered the essence of game design and it requires a lot of effort during balancing and testing. In the words of Schell:

We call simple systems that perform robustly in complex situations elegant. Elegance is one of the most desirable qualities in any game, because it means you have a game that is simple to learn and understand, but is full of interesting emergent complexity. And while elegance can seem somewhat ineffable and hard to capture, you can easily rate the elegance of a given game element by counting the number of purposes it has.

As the potential role of these factors in music games is most seen in the design process, I will refer to my own experiences with working on a "Into the Labyrinth" (published along *Game pieces as games – part 1* in the previous issue of IM-OS). As with many games in general it was an ongoing struggle for simplicity, it started with a bigger labyrinth for every player (which limited the number of them) and some additional objects in it. Parameters used for traversing the maze were also at first left for players' agreement until settling down on the set that provided best results in testing. In my opinion, the reduced game right now lacks a bit in Character, but it serves its purpose.

Closing remarks

Metaphorical contents of "balance" are very rich as it refers both to fairness and to harmony and quality of composition. I hope that in the course of the above work the similarities between games and some forms of structured improvisation were visible and two disciplines may inform each other.



I also hope that the approach might prove useful even for people not exposed before to gaming culture, those that care mostly about listeners, and not about performers of music or those who think that targeting any art-form at its performers yields too small an audience. It is yet another type of balance: Games vs. Music (or Experience vs. Spectacle). For game pieces it is surely better if more people play them, and maybe in the future this will be the case.

The information in both parts was intended to be very general. There is potential in games also if we approach them from a position of some specific normative preference. It is so far the most visible for points #4–#6 in the typology – "should" games be about skill? "May" they be about competition? I think there is a prospect for games to be a safe platform to share differences even on such delicate issues.

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Pieces and games

Archery, John Zorn Breathing Instructions, Federico Pozzer Chess Dark Souls Go Imagined Seconds, Jennie Gottschalk Into the Labyrinth, Adam Izaak Wasążnik Les Moutons de Panurge, Frederic Rzewski Monopoly Musical Tetris, Marcus Staniec Royal Game of Goose (*pictured right*) Snakes and Ladders Tetris (*pictured in text*)



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