**Rules and goals in game compositions**

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There are many examples of indeterminate compositions that use rule systems to generate activity. Such work is typically process oriented rather than result oriented: it specifies conditions and constraints as opposed to aims and goals. Rule-based indeterminate compositions require players to negotiate their way through the constraints provided by the rules, making decisions that produce sonic or behavioural outcomes. Games also use rules to limit the actions of their players, but tend to be goal-directed, with players negotiating their way through the constraints provided by the rules to complete a goal, or win-state.

**[SLIDE]** While both games and rule-based compositions create a ‘temporary world within the ordinary world, dedicated to the performance of an act apart’ (Huizinga 1955: 10) and share some attributes, there are therefore key differences that are delineated by the way games and rule-based compositions are defined. In games players generally focus on achieving the win-state, while in rule-based compositions players generally focus on the aesthetic result. In this paper I will present key definitions of games, focusing on their use of rules as a way to create decision spaces for players linked to goals, and consider how these systems might be applied to music to create game pieces that promote purposeful play. **[SLIDE]** [1’10]

**Definitions**

In order to determine the way in which compositions might qualify as games, therefore, it is necessary to consider some possible definitions of games. **[SLIDE]** Jesper Juul compares seven previous game definitions in order to develop his own *classic game model* which has six attributes: rules; variable, quantifiable outcomes; value assigned to possible outcomes; player effort; player attached to outcome; and negotiable consequences (Juul 2003: 36).

The definitions he considers also point towards rules as one of the core attributes of games. **[SLIDE]** For example, Katie Salen and Eric Zimmerman define a game as ‘a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome.’ (Tekinbaş and Zimmerman 2003: 96). Here rules create a system by providing a constraint, resulting in a competitive situation with an end state.

Equally Elliott Avedon and Brian Sutton-Smith’s 1971 definition states that a game is ‘an exercise of voluntary control systems in which there is an opposition between forces, confined by a procedure and rules in order to produce a disequilibrial outcome.’ (Avedon and Sutton-Smith 1971: ??) Again, a control-system is generated by rules, creating opposition and an outcome. Both definitions point towards rules as a means to delimit the available play space and constrain the actions of participants, with the aim of engineering an end-state for the ensuing process. They also produce a ‘variable, quantifiable outcome’ through the presence of goals and the notion of opposition and conflict.

**[SLIDE]** Chris Crawford highlights these competitive attributes of games in his *taxonomy of creative expression*, which differentiates games from toys and puzzles through the presence of four attributes: interactivity, goals, competitors, and attacks. More informally he notes that games are conflicts ‘in which the players directly interact in such a way as to foil each other’s goals’ (Crawford 2003: 8) and can be metaphorically characterised as situations in which the other guy ‘shoots at you in a manner that convinces you he’s out to get you.’ (Crawford 2003: ??)

Opposition and conflict also form part of Greg Costikyan’s definition, **[SLIDE]** which suggests that a game is ‘An interactive structure of endogenous meaning that requires players to struggle toward a goal’ (Costikyan 2002: 24). For both Crawford and Costikyan, impeding other players’ progress towards a win-state is a fundamental attribute of games. The space in which this struggle is facilitated is controlled by the game’s rules, and its purpose is to achieve the defined end condition(s).

For a composition to display game traits, arguably it has to satisfy these definitions of games. I will consider this by examining the way rules and goals affect such definitions in musical contexts. **[SLIDE]**

[4’00]

**Rules**

Rules create a *formal identity* for a game. While each playing of a game of *Cluedo* is different, depending on luck and player decisions, the game itself is always the same. The rules remain constant, but the routes through the space it creates are always different. Rules define the underlying structure of a game to create its formal identity. **[SLIDE]** This identity is not articulated by the game’s ‘aesthetic qualities (such as the names of the suits) or representational identity (such as its ability to be recognized by an observer)’ (Tekinbaş and Zimmerman 2003: 121), but the system which underpins it. This is important as it differentiates between superficially similar or different outcomes from rule sets.

**[SLIDE]** Salen and Zimmerman (2003: 127-139) define three different levels of rules in games, and consider the way these intersect to present a game’s formal identity.

*Constituative rules* are the underlying rules that determine the abstract relationship between game resources. **[SLIDE]** For example, the link between squares 29 and 52 by a snake in *Snakes and Ladders* is a fundamental constraint on the movement of players landing on square 52, but this does not form part of the game instructions as a specific case. Were the board to be set up with a different configuration or balance between snakes and ladders, the constituative rules would be different. **[SLIDE]**

The *operational rules* are the instructions for play. These are the rules communicated to the players that explain what they must do. This could be explained explicitly, as in a board game’s rulebook, or more implicitly, as in a tutorial level in a video game.

The *implicit rules* are those that are not formally defined but are expected of players, such as not taking extreme lengths of time to make a move, the need to take turns, or not turning the TV off while playing with an XBox.

Salen and Zimmerman suggest that the formal identity of a game is determined by both its operational and constituative rules, **[SLIDE]** noting that ‘As much as the formal identity of a game is tied to its constituative logic, the material way that players experience that logic, as proscribed by the operational rules, is equally important.’ (Tekinbaş and Zimmerman 2003:135) Games are defined both by the underlying structure of the play space and the constraints on players’ interaction with it.

**[SLIDE]** Salen and Zimmerman also suggest six general characteristics of game rules: rules limit player action; rules are explicit and unambiguous; rules are shared by all players; rules are fixed; rules are binding; and rules are repeatable (Salen and Zimmerman 2003: 122-3). For example in a classic game such as draughts, all of these characteristics are clear.

Some games seem to present exceptions to this framework however, such as the **[SLIDE]** continually changing set of active rules and goals in card game *Fluxx* (1996), or the unequal resources and movement possibilities in traditional games such as **[SLIDE]** *Tafl*.

But these apparent variations are covered by the constituative rules that account for such variation. It is, for example, part of the rules of *Tafl* that the two players have different goals, game pieces, and movement and capture rules, but that both players know this in advance. In stating these six characteristics, Salen and Zimmerman note that this represents ‘quite a classical way of understanding games’ (Tekinbaş and Zimmerman 2003: 123), and that it is possible to create games which do not necessarily demonstrate all of these characteristics.

When we translate these two frameworks to rule-based music, there are many similarities. Salen and Zimmerman’s three game rule levels also present a useful way to consider the formal identity of a composition. The constituative rules present the underlying process or formal structure of a composition. The operational rules instruct players, and are mostly articulated through the score. The implicit rules are the performance practice.

**[SLIDE]** For example in Alvin Lucier’s *I remember* (1997), the constitutive rules define the setup for the piece: a collection of resonant found objects that can be activated by the performers singing pitches into them. Once set up, these resources create the formal structure for the performance environment, resulting from the acoustic characteristics of the selected objects. The operational rules are located in the main part of the score that explains what the performs must do: sing slowly sliding pitches into the objects in order to discover and explore their resonant frequencies, occasionally interjecting prepared statements about personal memories. These rules are different from the constituative rules as they determine player behaviours, rather than the constraint of the system that defines the space for their actions. The implicit rules are unwritten and include creating an effective balance between voices, appropriate performer movements and staging, and an awareness of the broader performance practice of Lucier’s work. These are in part communicated through documentation of previous performances to present a model, but they are outside of the core specification of the piece presented in the score as constituative and operational rules.

**[SLIDE]** Most of Salen and Zimmerman’s six characteristics of game rules also translate clearly to indeterminate music. Some are traits of scores in general: rules limit player action in order to prescribe a specific space for the piece; rules are shared by all players, even if individual variations are prescribed (i.e. separate parts); rules are fixed, regardless of the variations they might create in realisations; rules are binding, in order to produce a valid realisation; and rules are repeatable to enable multiple realisations of a piece.

There are, however, many instances of rules in indeterminate compositions that are not explicit and unambiguous. Obvious examples are found within some of **[SLIDE]** George Brecht’s event scores, such as *Concert for Orchestra* (1962) which comprises the additional text ‘( exchanging )’. Brecht’s scores are often very ambiguous, and problematize the relationship between rules and identity in verbal notation. In contrast to Salen and Zimmerman’s view that constituative and operative rules give a game its formal identity, with Brecht it is arguably the implicit rules – the performance practice – that determine the experience of the work.

**[SLIDE]** Rules create the formal identity of a game, allowing us to differentiate between games at a fundamental level. While these frameworks can be translated to music, they do not adequately differentiate between game pieces and rule-based compositions more generally, as demonstrated by the previous examples, none of which could be characterised as game pieces. In addition to rules, games and game pieces also require ‘variable, quantifiable outcomes’, or goals. **[SLIDE]**

[10’40]

**Goals**

Although rule-based compositions often encourage a playful and interactive attitude, this does not necessarily result in a game. **[SLIDE]** For example in Antoine Beuger’s *ein ton. eher kurz. sehr leise* (1998) two players are tasked with making a single sound in alternating 30 second periods. There is no aim here other than making the sounds within the constraints provided. The players are tasked with specific actions, defined by operational rules, but not necessarily required to strategise their articulation of these actions with regards to a goal. Rules are used simply to prescribe a set of activities. Players engage in these activities, and the piece is the result. There is no explicit goal presented, other than the successful completion of the tasks and an implied aesthetic result.

This is not a game, but it is playful in the way the duo’s sounds may be placed close together, only to force separation in their next repetition. Of course, making a game composition may not be the aim of composers making rule-based pieces. But if we do want to reframe this kind of playfulness as game play, goals are required. In games, goals direct players in particular ways, **[SLIDE]** such that if you ‘add a goal to informal play…you will usually have a game’ (Tekinbaş and Zimmerman 2003: 258).

A goal, in its simplest form, **[SLIDE]** is ‘a specific achievable state of affairs’ (Suits 2005: 50). It needs a quantifiable outcome, such that it is ‘designed to be beyond discussion, meaning that the goal of *Pac Man* is to get many points, rather than to "move in a pretty way".’ (Juul 2003) While a player’s actions might exhibit structure or direction when playing in an open-ended way (Crawford 2003: 7), a goal is something that can be measured or tracked. Goals also imply the presence of conflict (Crawford 2003), whether this is between players attempting to reach a mutually exclusive goal, goals which themselves are conflicting, or where there is the possibility of not reaching a specified goal (Juul 2003). Goals in games might be simple, **[SLIDE]**  such as avoiding drawing an exploding kitten card such that ‘if you explode, you lose … if you don’t explode, you win’ in card game *Exploding Kittens* (2015), or they might be complex and multi-layered, **[SLIDE]** such as completing many sub-quests in order to finish the overall quest in video role-playing games such as *Baldur’s Gate* (1998).

Goals vary in quality. In addition to the scope of a goal, from ‘quick, low-level goals’ to ‘long-term, higher-level goals’ (Church 2006: 373), and its permanence (Juul 2010), the compulsoriness of a goal shapes the ensuing game play. **[SLIDE]** Juul suggests that there are three approaches to goal specification in games: obligatory goals, optional goals, and no goals (Juul 2007).

Obligatory goals are ‘explicitly communicated’ and the sole arbiter of success. Obligatory goals might measure progress or a final win state, although may not necessarily be achievable, such as in a game which generates increasingly difficult levels each time one is completed and where success is measured against a high score table.

**[SLIDE]** Optional goals are found in games that ‘let players decide for themselves what goals they wish to pursue’ and can ‘vary from player to player’ (Bjork and Holopainen 2005). In such games the player is ‘is free to deviate from the official goal of the game and make up personal goals’ (Juul 2007). Typically role-playing games do this, allowing for ‘a diversity of goals, allowing players to pick and choose among them, to find one that appeals.’ (Costikyan 2002: 14)

Juul’s final category, no goals, is perhaps the most significant for music. Although classic game definitions suggest the need for goals, Juul notes **[SLIDE]** that this model is changed by removing goals or by ‘not describing some possible outcomes as better than others.’ (Juul 2003) He notes elsewhere that ‘Games without goals or with optional goals can accommodate more playing styles and player types, in effect letting players choose what kind of game they want to play.’ (Juul 2007) By making goals optional, or removing them completely, it presents a space for players who may ‘care more about the aesthetic or sentimental value of game choices than about the optimal way of playing the game.’ (Juul 2007)

In rule-based compositions, the necessity of achieving a specified goal has significance for the way a realisation proceeds. **[SLIDE]** For example, there is an obligatory goal in the fourth section of Christian Wolff’s *Burdocks* (1970-71) which requires a group of players to ‘play as simultaneously as possibly with the next sound of the player nearest you’, before widening this activity out and culminating by playing with ‘the player farthest away from you’. This obligatory goal is transient, with conflicting choices by other players making it hard to reach. Here the obligatory goal gives players a reduced amount of agency as all choices must necessarily resolve to the goal for the realisation to be successful, or at least valid.

In contrast, optional goals, or potentially no goals, are apparent in **[SLIDE]** John Zorn’s *Cobra* (1984), perhaps the single piece most commonly referred to when considering game compositions. *Cobra* comprises a set of rules for interaction between a group of improvising musicians and a prompter. **[SLIDE]** The piece presents a series of cues that the improvisers may request from the prompter, who then articulates these through showing coloured cue cards and giving downbeats that initiate the requested change. The improvising musicians are therefore controlled by the cues they are given, but are also able to request cues to give. The prompter selects the cues to give from the available player requests, but is also able to initiate cues directly. **[SLIDE]** The types of cue Zorn uses define relationships between players, time and material. For example, the cue SX is ‘Substitute Crossfade’ which requires ‘all must fade either in or out’, resulting in a crossfade between those playing at the time of the cue and those that are not playing. The core rules may also be subverted by a player forming a guerrilla squad (by putting on a headband). When acting as a guerrilla, players can ignore the rules, capture other players, play anything, make any calls and form new sub-groups.

Clearly the options to ignore the rules, play anything, and silence other players create more individualised possibilities, despite the dominance of ‘quick, low-level goals’ (Church 2006: 373) that shape moment-to-moment interaction. But despite the richness found in the vibrant interaction, competition, and attacks, *Cobra* has no stated long-term goals. It creates a complex and ever-changing decision space for the players, enabling them to negotiate a musical output with respect to specific rules and short-term goals, but there is nothing for the players to aim for in an objective sense: no win-state, or even an end condition other than the three arbitrarily applied ending cues.

[17’20]

**Conclusions**

Although some of these examples of game compositions conform to classic game definitions, as with games themselves the situation is more complex. The absence of clear long-term goals in pieces like *Cobra* point to what Juul, talking about games rather than music, **[SLIDE]** terms an *expressive game* which ‘allows players to arrange and combine the elements in the game in a large number of different ways in a way that players interpret to have a wide range of meanings.’ (Juul 2007) This is also noted by Costikyan who suggests that the freedom found in a good game allows players to ‘experiment with alternate strategies and approaches’, making the game structure ‘multi-dimensional, because it allows players to take many possible paths through the “game space.” (Costikyan 2002: 20)

This freedom, or player agency, is due to the interaction between constituative, operational and implicit rules and obligatory, optional and no goals in both games and rule-based compositions. Obligatory goals present a clear aim for players, but the means of achieving them varies depending on the space afforded for action by the rules and conventions of play. Optional goals may also present clear aims, but an additional level of agency is presented to players as they select specific, personal aims. Having no goals reduces the gamelike state under some definitions, but provides greater agency through developing an environment that promotes constrained play. Games and rule-based compositions balance these constraints in order to mediate the way players interact with their systems.

It appears then that there are two converging trajectories here: games that seek to create greater agency for players by opening up or removing goals, and rule-based compositions that use goals and decision-making to imbue a piece with values and direction. While some games and theory suggest that the ‘aesthetic or sentimental value’ of ‘expressive games’ (Juul 2007) is of increasing significance, game compositions are beginning to explore this from the opposite direction, using rules and goals to create purposeful play within such aestheticized spaces. The convergence of these two trajectories opens up the possibility of new hybridised forms that consider the relationship between playing games and playing music as a way to communicate values and identities.

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This paper applies theory drawn from game studies to music composition in order to consider ways in which rules and goals create environments that promote critical play (Flanagan 2013). Game studies research shows that games rely on interactivity, goals, competitors and conflict (Crawford 2003), and consequently effort from its players so as to attach value to its outcomes (Juul 2003). To do this, games use rules in order to create a ‘temporary world within the ordinary world, dedicated to the performance of an act apart’ (Huizinga 1955: 10). In game compositions, rules are used to present choices, allowing individual players to make autonomous decisions that are focused on achieving a specified goal. Individual decisions may influence the overall outcome of the music, but other players’ actions prevent individual control through obstructing these goals. While rules might be simple, complex individual and group behaviours emerge, presenting models of social interaction. The paper explores correspondences between rules in games and indeterminate music, and considers how constraints create agency for players through presenting them with choices and goals.