Audio only computer games – *Papa Sangre*

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Abstract

This article attempts to analyse the audio-only game *Papa Sangre.* It discusses the background to the analysis and the history of of audio-only games, before concentrating upon *Papa Sangre* itself. It locates the game within the survival horror genre and explores how the gameplay operates from both a technical and player's point of view. It then locates the analysis within a field of film and game sound analysis, considering how audio-only games differ from videogames. It outlines several theoretical approaches to the typology of videogame sound, before proposing a hybrid approach that is more appropriate to audio-only games. It applies this to the sound world of *Papa Sangre* and analyses some captured gameplay. The essay concludes by suggesting a relationship between *Papa Sangre* and musical performance and composition.

Keywords

audio, gaming, analysis, music

1. Background

A preliminary study for this article was first published by Andrew Hugill on the OREMA (Online Repository for Electroacoustic Music Analysis) website on January 30th 2012, under the title 'Towards an analysis of *Papa Sangre,* an audio-only game for the iPhone/iPad'. The article was written in response to discussions that took place during the first symposium of the AHRC-funded project *New Multimedia Tools for Electroacoustic Music Analysis.* One of the project leaders, Leigh Landy, expressed the view that the playing of computer games could produce an algorithmic electroacoustic musical composition, regardless of the intentions of the player. Hugill suggested that the genre of audio only gaming (which was unknown to all present) offers peculiar opportunities in this respect.

Interactive work presents a particular challenge for electroacoustic music analysis, since the fixed object that is typical of most examples is no longer present. Furthermore, the experiences of the user, who acts as both 'composer/musician' and 'audience' in interactive music, are central in a way that is substantially different to the passive listener at an acousmatic concert. Hugill consequently adopted an 'aestheticist' approach to the early study, using the 'pleasure framework' first identified by Brigid Costello (Costello 2007, 370-371). *Papa Sangre* was selected because it offered the clearest examples of electroacoustic sound design and processing as part of the gaming experience.

The preliminary study considered only the first three levels of game play. To prepare the present article, more substantial research into the entire game

was conducted. Student subjects were invited to play the game and record their experiences. Accounts of the gameplay given in various gaming forums, and a detailed description given on the Enongo blog (Enongo 2012) were added to the documentation. Finally, Panos Amelides joined the analytical team and combined his gameplay experiences with Hugill's own.

At the heart of this article is not simply an analysis of *Papa Sangre,* but a consideration of the applicability of various analytical frameworks and methods. Given that this is an audio-only game, how useful are approaches from electroacoustic music analysis, or should it only be considered in terms of gaming? The article tentatively explores this question, first by using frameworks that are common in gaming analysis, then by proposing a hybrid approach that overlaps with electroacoustic music analysis.

2. Audio games

Audio-only games, or audio games, have a rich history that may be traced back to the Atari game *Touch me* (1974), a memory test which combined visual and audible signals, but could be played using the sounds alone. A more popular version of the same idea was the Milton Bradley Company's *Simon* (1978), which used a handheld mobile device comprising four coloured buttons that had to be pressed in sequence to match an audio cue. This game became very popular, spawning many imitations and to some extent defined the generation gap at the time (Edwards 2006).

Text-to-speech (TTS) applications such as MacInTalk, which was installed on Apple computers from 1984, opened up the possibility of audio versions of text-based adventure games. These acquired a wide following, particularly amongst visually impaired gamers, who subsequently represented the primary constituency for audio games. As the video capabilities of computers developed, however, games creators increasingly moved away from text-based games, leaving an ever-dwindling group of audio gamers apparently lagging behind developments. This led to a culture of amateur enthusiasts and very small companies, who either adapted video games for visually impaired users or, increasingly, created audio-only games. This culture is still very much in evidence, particularly on dedicated sites such as audiogames.net. Two typical examples of such games are *Terraformer*, in which the gamer has to fight robots in order to gather terraforming tools, a process which is made possible by 3-D sonar navigation; and *Seuss Crane: Detective for Hire*, which is effectively a drama in which the gamer plays the detective.

Meanwhile, console games makers began to show an interest in audio games. Probably the most important early example was Kenji Eno's *Real Sound: Kaze No Regret* (1999), which was made available on the Sega Saturn and Dreamcast platforms. In this game, a narrative builds around themes of fear and love, governed by critical decisions made during the game. Nintendo entered the market subsequently, producing a series from 2006 onwards called *Soundvoyager*, in which users navigate using only sound clues. The advent of smartphones has opened up this market still further with many popular new titles, such as *Ear Monsters* (shooting audible monsters), *Freeq* (futuristic audio adventure), *Audio Archery* (archery shooting), and *Zombies, Run* (running game).

Games such as *Papa Sangre* may be said to be a synthesis of all these historical developments, representing both a conscious effort to address the visually impaired market, while also opening up the experimental potential of audio-only gaming to a wider audience. This is reflected in market share which, while it remains a tiny fraction of the games market as a whole, has nevertheless seen a significant expansion. Interviewed by the BBC in 2005, the co-author of audiogames.net said "my guess is that about 3,000 audio or blind-accessible games are sold a year" (van Tol, 2005). However by 2012 the director of the *Papa Sangre* project announced, at a BAFTA 'What's App' event in London, that the game had sold "about 70,000 copies" on iOS (Bennun 2012). It seems most likely that this market has gone well beyond visually impaired users, an impression which is confirmed by the various Youtube reviews and discussions in gaming forums. At the time of writing, Somethin' Else are about to launch a new version of *Papa Sangre* and another audio game, *The Nightjar,* so clearly the market offers significant opportunities.

Mobile phone games are, as Karen Collins points out, "distinguished from handheld gaming in that games are not the primary intended use of the machines" (Collins 2008, 77). Nevertheless, the capabilities of smartphones are such that they can now deliver high quality and, most importantly, binaural sound through headphones. Their portability and mobility make them ideal devices for visually impaired gamers. The pervasive nature of these media also allow audio games to be presented as a fascinating experimental corner of the videogames market, something which is apparent in all the marketing for *Papa Sangre.* It is now possible to imagine an audio game achieving the same iconic status within mobile phone gaming as *Simon* did in the pop culture of the 1970s.

3. *Papa Sangre*

Papa Sangre is an app for the iPhone and iPad that was developed by a team at *Somethin' Else*, a London-based content design company, including Paul Bennun, Ben Cave, Adam Hoyle of Do Tank, Peter Law, Margaret Robertson, Nick Ryan and Tassos Stevens of Coney, with support from *4iP.* The game was launched in 2010, and rapidly attracted attention, both for the novelty of the approach and for the quality of the sound design and gameplay. The game was developed in software (including the *Verb Session* reverberation tool and the *HEar* binaural encoding tools from IRCAM), but also through playing a theatre game called 'Sangre Y Patatas', a kind of Blind Man's Bluff using nachos on the floor and other sound cues to simulate the gaming interaction (Papa Sangre Blog, 2010).

Papa Sangre is a 'first person' game, in which the gamer navigates through a virtual world using only aural cues. Movement is enabled by left-right-left-right touching of the lower half of the screen, corresponding to footsteps. Orientation is adjusted by scrolling the upper half of the screen. There are graphics (feet and a dial) that correspond to these regions, but there is no need at all to be able to see them.

All the audio in the game is binaural and is designed to be experienced wearing headphones. Some was pre-recorded using a dummy head wearing a pair of microphones positioned at the outer ears. The resulting Head Related Transfer Function (HRTF) compared the arrival times and intensity differences of the binaural cues received at the different ears in order to simulate a '3D'

effect that effectively mimics the way humans actually hear. The same effect may also be applied to synthesized sounds, which was done in *Papa Sangre* by using the Create Signal Library (CSL, pronounced 'sizzle') (Fastlab 2009). This is a C++ library for digital signal processing which offers the scalability, complexity, flexibility and portability that is essential for a game that changes as rapidly as *Papa Sangre.*

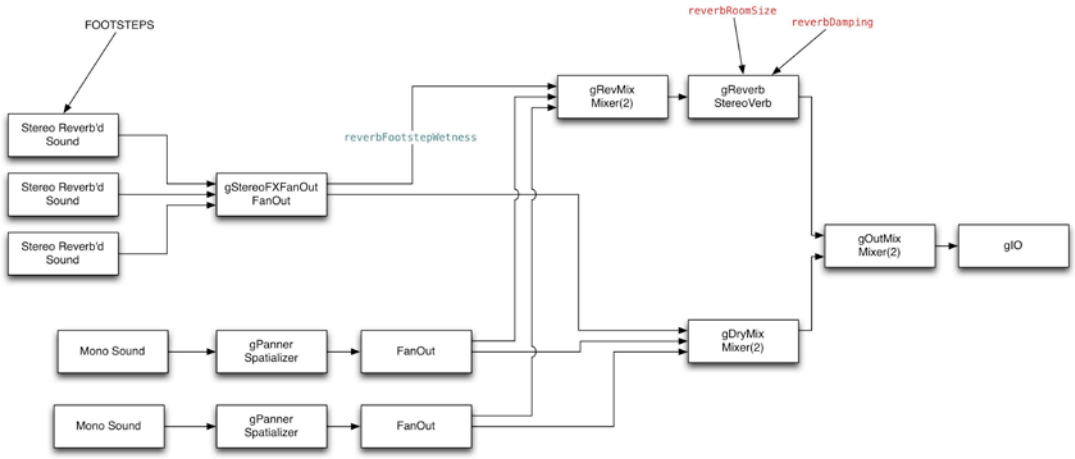

Figure 1: *Papa Sangre*: CSL Graph

Figure 1 shows how the reverberant characteristics of the gamer's 'footsteps' are combined with the virtual space or 'room', and any other sounds that are present, to create an overall mix at any given moment. This mix provides the locative precision that enables navigation during the game. In addition to the CSL processes, the pre-recorded 'dummy head' binaural sounds are also fed directly to the gOutMix Mixer to be combined with the synthesized material when triggered by the gameplay. The result is an 'immersive' environment which has the capacity to deliver both general atmosphere and precise location detail.

Papa Sangre is an example of 'survival horror', a genre that is typified by a "total atmosphere [that] is densely creepy" (Whalen 2004) in which the gamer is powerless, with survival dependent upon successful completion of puzzles and avoiding dangerous enemies. The narrative of *Papa Sangre* plunges the gamer into the land of the dead, a dark and frightening place whose blackness parallels the situation of the unsighted gamer him/herself. The whole story has a Cinco de Mayo, voodoo quality that owes a lot to the tradition of B-movie horror.

The gameplay involves puzzle solving which is constantly hampered by hostile creatures that block your path. These hostile creatures come from voodoo nightmares, such as: flesh-eating snuffle hogs (the main enemy from the start); a slasher bird that tries to "peck your skull clean" (first introduced at Level 8); the grim reaper, complete with scythe, who multiplies and giggles from Level 9 onwards. Your mission is to "save a soul in peril", a goal which is announced during Level 1 (Into the Dark):

> The sound of a telephone ringing in my left ear (left channel) and I hear a child singing “twinkle, twinkle little star” in my right ear (right channel). The telephone continues ringing and I hear distant cars and it feels like being in the sidewalk of a big avenue in London(?) as the phone ringing continues. Then, a door closing sound and a click as the player (me?) apparently picks up the ringing phone. At the other end of the line like a person with a funny Spanish accent is greeting me in my right ear: *“Buenos dios compañeros. The soul of someone dear to you is in grave danger. To save him you must leave this world and follow me into the*

> *kingdom of Papa Sangre. No time to lose!"* (Panos Amelides, gameplay notes)

To achieve this goal, you are aided by a disemodied female voice that has a distinctly 'correct' English accent (Enongo likens her to Catherine Zeta Jones). She provides training and advice, but her role becomes increasingly ambiguous as the game progresses, sometimes disappearing for long periods and at other times appearing to be rather treacherous. In Level 17, for example, she teases the gamer by repeatedly changing location while calling to you to follow her. As Amelides remarks:

> Her voice continues to be audible and I have the feeling of being Ulysses and she is one of the Sirens. Is it possible that now she will prove to be untrustworthy, against me and trap me?

She defines herself from the start as the Fluttery Watery Thing (FWT) and has a metaphysical presence that is part narrator, part guide, part trainer, and part mischievous fairy.

Red herrings are also often thrown across the gamer's path, especially in the form of morally challenging decisions relating to the central rescue mission. In Level 12 (The River), for example, you are given guidance by the FWT that saving the old man who pleads for help will be "more trouble than it's worth". But by Level 18 (Little Girl) you are left to choose whether to rescue the little girl. If you try to do so, her loud voice acts as a further barrier to completing the level. Papa Sangre himself comments: "You're learning that charity may get in the

way." Such "lessons" set up the ambiguous ending (Level 25, Elysium), which offers a choice of two possible outcomes to the entire game.

Papa Sangre, whose name immediately conjures up voodoo (the voodoo priests are called 'Papa') and blood ('sangre'), is a grotesque vocal presence who appears only infrequently, at the start (through a telephone) and in the later levels. He is clearly positioned as the 'boss' (Collins 2008, 91) towards whose palace you travel, in the manner of a platform game. His menace is sonified as a cackling laugh, and as sound effects during instructions: "*They* (bells) *bring Papa to your side and he'll tape you* (sound of tape being stretched) and nail you (sound of hammering) *and burn you to hell"* (Level 24, The Fate Bell). The FWT occasionally fulfils the 'miniboss' role ("*Of course you can trust me, I only speak what Papa Sangre says",* Level 17).

These strong narrative elements provide the framework for the aural navigations which are the core mechanics of the game. They rely on detailed and accurate listening in three dimensions. The key items on each level are musical notes, which must be gathered before the level may be completed (by finding the exit). So, for example, in Level 12, The River: "as the slasher bird makes its way back from my right ear to the left ear, crowing the entire time, the music note beeps ahead of me, alternating back and forth between a low and a high, string sound (Enongo 2012). The player must navigate through many different terrains, avoiding obstacles and enemies, and at varying speeds (walking or running) appropriate to the situation, while constantly adjusting orientation. Failure to do so adequately may lead to "death" at the hands of an enemy, following which the player is reincarnated (your soul enters a new body) to restart the level. Such

operations provide much of the sense of timing, with its attendant tension and release, in the game.

All players commented on how the game developed their listening skills as they learned to "see with [their] ears" (Level 1, In the Dark). The skills change with the different demands of the various levels, increasing from simple orientation while standing still, to sophisticated skills such as listening while you run, discriminating between sound types, listening past masking sounds, and using aural memory to recall the locations of various sonic objects. These skills require a high level of hand-ear coordination through making manual responses to particular audio stimuli.

Given the filmic qualities of the narrative, it is is interesting to compare the function of sound and music within *Papa Sangre* with its traditional role in film and indeed within video games. Michel Chion's *synchresis,* which refers to "the spontaneous and irresistible weld produced between a particular auditory phenomenon and visual phenomenon when they occur at the same time"(Chion 63) is clearly incapable of unifying the functional interaction of image and sound in an audio-only environment. Instead, we have to rely on *imagination* to supply the visual component, allowing for some amusing creative possibilities within the game, such as the sound of squeaky toys that are heard when you step on 'bones' that might alert the snuffle hog. The gamer's footsteps themselves, which are the most constant sounds in the game, are examples of this kind of imaginative anomaly, since they have the audible appearance of Cuban heels regardless of location.

This is emphasized still further when considering the role of *music* in the game. As Zach Whalen observes:

> In general survival horror games rely on conventions of horror film sound to effectively create the mood of horror required for the game (echoing effects, screeching violins, dissonant bursts of symphonic noise at "startle" moments, etc.)" (Whalen 2004)

In *Papa Sangre,* this role is only partially fulfilled. The primary musical elements are the 'notes' that must be collected. Music that resembles orchestral movie accompaniments only begins to appear at Level 13: Pathway to Pain, which is accompanied by " a simple, somber and yet theatrical song, with a longing violin, and deep horns in the background alternating between 3 chords" (Enongo 2012). But even such conventional elements fulfil an ambiguous role, being gradually subsumed into the soundscape of Papa Sangre's kingdom. Thus the ritual drum beating and chanting of Level 15, or the Xylophone Road of Level 16 (in which brass instruments and cymbal clashes denote the right and wrong steps), move from 'music' to 'sound', simultaneously enriching the sonic environment and musicalising the gameplay.

Such subtle and clever orchestration represents an important aspect of the *emotion map* of the game (Collins 2008, 91) which corresponds to the scripted events. In *Papa Sangre* the audio emotions are not simply evoked by the soundtrack, they are *embedded within it.* Collins cites two composers discussing the role of emotion within game sound:

> As composers Charles Deenan has described, there are six basic audio emotions: happiness, sadness, surprise, disgust, anger, and fear, and each

> of these can be mapped to major scripted events. Composer Scott B. Morton (2005) writes: “The musical arc is often more important than the literal events themselves because it can infer deep meanings…Is the final boss battle more important than the miniboss battle? Show it in the music. A player should be able to subconsciously interpret the importance level of events based on the music that accompanies them (Ibid. 92).

Here the "major scripted events" are themselves sonic events. Thus, the finding of a musical note is accompanied by a "joyful bell-like sound" (Student B) and the level exit is signalled by a "sparkling" sound towards which one must navigate, and which, once passed through, provides the release of tension through the sound of a closing door. Searching for these key items provides much of the tension that is enhanced by the various environmental sounds and effects. Screeching ghouls wistle past, buzzing flies (perhaps around corpses) obscure the navigation sounds, crowing birds threaten. Successful navigation often depends on speed as well as direction: sometimes one must move slowly, other times one must run or stand still. The echoing footsteps which are your presence in the world are therefore also significant builders of tension.

This elision of the underscoring of the action traditionally provided by video game music and soundtracks, into its direct mainfestation in the fabric of the game itself has a direct effect of heightening the emotion. In *Papa Sangre,* the primary emotion is fear, and all the gamers commented on how powerful this is:

- the voice of Papa Sangre interrupts everything and I am suddenly filled with fear and anxiety (Enongo)

- Specifically, emotions are closely related to fear of the unknown, anxiety, nervousness, fear of threat (Amelides)
- The sense of danger is surprisingly realistic, especially given the compromises in verisimilitude that are of necessity made by the game's design. This sense lasts beyond the game, at least for the present author, who experienced a rather unpleasant nightmare that was clearly derived from the gameplay (Hugill).

Such strong emotions are often accompanied by physical symptoms. Gamers make references to exhaustion and "adrenaline all over my body". The immersive experience seems to be heightened by its audio-only nature. The gamer *becomes* the medium for the game, through which the game-space is projected. All the gamers reported feeling themselves to be *inside* the game, a participant rather than just a "user".

Analysis

Traditional game sound analysis (and film sound analysis, for that matter) makes a distinction between diegetic and non-diegetic sounds, where "diegetic" refers to sounds emanating from visually represented objects within the game environment, whereas "non-diegetic" sounds are the opposite. This distinction is not as straightforward as might at first appear, especially when music is added into the mix. As Whalen points out:

> The music/sound problem is further complicated by a distinction between diegetic and non-diegetic music in that the diegetic music functions similarly to the incidental diegetic sounds that populate an environment (Whalen 2004).

In a game that consist *only* of sound, the diegetic/non-diegetic distinction may at first appear to be redundant in any case, since there are no visual representations from which the sound may appear to emanate. Yet *Papa Sangre* nevertheless makes use of quasi-diegetic videogame sounds. In fact the vast majority of sounds in the game fall into this category, because the gamer's navigations rely upon the locations of the *imagined* objects from which they emanate. Thus the grunting of the snuffle-hogs or the giggling of the reapers or the echoes from the walls or the click-clack of your footsteps provide the very location cues on which your survival depends. Even the music, which is deliberately held back until the later levels (perhaps to avoid confusion), is absorbed into this signifying soundscape, as we have seen.

Papa Sangre's world, then, is an acousmatic environment in which the emphasis is thrown very much upon *causal* listening, or "listening for the purpose of gaining information about the sound's source" (Chion 1994, 25). *Semantic* listening (listening for the purpose of gaining information about what is communicated in sound) is also present, most notably in the spoken instructions of the FWT and Papa Sangre. The extent to which Pierre Schaeffer's *reduced* listening ("listening to the sound for its own sake, as a sound object by removing its real or supposed source and the meaning it may convey") is present is a matter of discrimination by the gamer. There is relatively little in the game

that functions as incidental sound which is barely noticed *(ouïr).* The level of understanding *(comprendre)* is deliberately simplified to facilitate game-play. Since every sound is in some way a clue, discrimination between sounds *(entendre)* is encouraged (Chion 2009, 11).

Such listener choices in the gaming context are generally born out of necessity rather than any specifically musical intention. Nevertheless, several of the gamers reported moments at which they enjoyed playing the soundscape of the game for its aesthetic properties as much as for its gaming aspects. This became more frequent as their listening skills developed. As Nicolas Bourriaud remarked, in a very different context:

> The artist works in the real field of the production of goods and services, and aims to set up a certain ambiguity, within the space of his activity, between the utilitarian function of the objects he is presenting, and their aesthetic function (Bourriaud 2002, 35).

An artist playing *Papa Sangre* may well be able to appreciate this ambiguity in the interactions with the game. There remains a further possibility that gamers themselves may also enjoy the ambiguity and relish the soundscape for the aesthetic pleasures it affords as well as its functional aspects. Leigh Landy, referencing Chrisopher Small's concept of 'musicking', suggests that this is often the case, whether or not the players themselves realise the fact:

> [Small] includes not only composing and performance but also listening and dancing as pertaining to the music experience. Yet, is it not true that

> the installation and the computer game also form new ways of musicking? (Landy 2007, 8).

Environmental factors beyond the virtual world of the game itself are important. At first, the very mobility of the iPhone/iPad platform was seen to offer possibilities for enhancing the gaming experience. As Student A commented, while playing in a bright, daylit room, "I can imagine playing this in a dark room at night", an idea that was echoed by all players (including 'under the bedclothes'). However the game also proved sensitive to external location in ways which could sometimes be disruptive. Enongo experimented by playing in a pizza parlour:

> I realized that I have begun to think of the game as a part of my body, operating within the same framework of rules that applies to sound in the "real world." When the voices in the pizza shop became too loud, I started leaning closer to the screen as if that would increase the volume, until I remembered that I could only make the volume of the in-game sounds louder by moving closer to certain objects within the virtual space.

Panos Amelides similarly observed:

> I played *Papa Sangre* in the privacy of my room, during the night and with reduced lighting, in order to enhance experience. But, when I tried to play it during the day, in my living room, various sounds coming from outside the house would 'mask' the sound design of the game.

Complete immersion into the virtual environment was therefore seen as a priority for the best (i.e. most frightening) experience.

In their study of the acoustic ecology of first-person shooter games, Grimshaw and Schott introduce a concept of *navigational* listening, in which localisation is designed into the resonating space of the game (Grimshaw and Schott 2007, 476). Building on R. Murray Schafer's soundscape theories, they identify the spatial and temporal elements of a virtual acoustic environment, with "keynote sounds" (ubiquitous and pervasive background) and *aural figures* or "signal sounds" (which the player will attend to and interpret). This goes a considerable way towards providing a perceptual and phenomoenological framework for analysing *Papa Sangre,* but founders somewhat once the diegetic/non-diegetic relationship with the video component is introduced.

Other typologies proposed by game audio theory, which are similarly focused upon the relationship between visible objects and sounds, also tend to have the same problem. Thus, for example, the IEZA (Interface, Effect, Zone, Affect) framework created by Sander Huiberts and Richard van Tol develops Stockburger's technically derived categorisation of 'sound objects' into *score, effect, interface, zone* and *speech.* They place sounds within a diegetic/non-diegetic field centred on the player, in which *Interface* expresses the activity in the non-diegetic part of the game environment, *Effect* expresses the activity in the diegetic part of the game, *Zone* expresses the setting or environment (e.g. geographical, topological, etc.) within which the diegetic part of the game takes place, and *Affect* the non-diegetic equivalent (e.g. emotional, social and/or cultural) (Van Tol and Huiberts, 2008). Likewise, Ingmar Ekman's division of

sounds into diegetic and non-diegetic signals and referents relies upon a perception of the relationship between the video image and the sounds that are heard by the gamer (Ekman 2005).

Most commentators criticise the limitations of the approach adopted by Friberg and Gärdenfors, whose system is based on the implementation of the audio rather than the perceptual aspects. Their typology comprises: *avatar sounds, object sounds, (non-player) character sounds, ornamental sounds* and *instructions.* Van Tol and Huiberts comment:

> Besides the considerable overlap between the categories of this categorization (for instance, the distinction between object sounds and non-player character sounds can be rather ambiguous), this approach is very specific to only specific game designs. It says very little about the structure of sound in games (Van Tol and Huiberts 2008).

Despite these reservations, Friberg and Gärdenfors' typology is the only one conceived for audio-only games. They analyse *TiM's Journey,* a game in which "the avatar is moved around a three-dimensional soudscape to unravel a hidden mystery" (Friberg and Gärdenfors 2004, 150). One stated objective of the game design is "to maintain an ambiguity between what are object sounds and what are ornamental sounds" (Ibid. 151), which is similar in both concept and realisation to the design of *Papa Sangre.*

In audio-only gaming, *every* sound has a function within the game and we may only really speak of quasi-diegetic and quasi-non-diegetic sounds. The only truly non-diegetic sounds are those created by the physical environment within

which the player is seated and which may intrude upon gameplay as already discussed. The diegetic and non-diegetic functions of sounds such as avatar footsteps and music, for example, are only *relative* within an audio-only game. *Papa Sangre* actively plays with this conundrum.

A framework for analysing *Papa Sangre,* therefore, needs to be, to some extent, a hybrid of all the above approaches. It needs to reflect the 3D sound perception of location for the gamer, and the flow of affects and effects, triggers and instructions, and all the other events that make up the game. If we consider the sounds of *Papa Sangre,* we may place them within the various theoretical frameworks summarised above as follows:

	Ekman	Grimshaw/Schott	IEZA (Van Tols & Huiberts)	Friberg/Gardenfors
Papa Sangre				
Footsteps	Diegetic	Aural figures/causal auditory icons	Effect	Avatar sounds
Instructions	Symbolic/Non-diegetic	Aural figures/causal auditory icons	Effect	Instructions
Character speech	Diegetic	Aural figures/causal auditory icons	Effect	Character sounds
Triggers	Masking	Aural figures/causal auditory icons	Effect	Object sounds
Enemies	Diegetic	Aural figures/causal auditory icons	Effect	Object sounds
Masking	Diegetic	Aural figures/causal auditory icons	Effect	Object sounds
Obstacles	Diegetic	Aural figures/causal auditory icons	Effect	Object sounds
Orientation	Diegetic	Aural figures/causal auditory icons	Effect	Object sounds
Soundscape	Diegetic	Keynote sounds/choraplast	Zone	Object sounds
Music	Symbolic/Diegetic	n/a	Affect	Object sounds/Ornamental sounds
Gaming situation	Non-diegetic	Synchretically combined with resonating space	n/a	n/a
Haptic clues	n/a	n/a	n/a	n/a
Synaesthetic	n/a	n/a	n/a	n/a

Figure 2: 'Papa Sangre' sounds classified

Here the *footsteps* represent the presence of the gamer in the game, governing timing and causing triggers to be activated. Scrolling the wheel in conjunction with the footsteps provides the sole navigational tool. *Instructions* are mainly delivered by the FWT, and occasionally by Papa Sangre. *Character*

speech, such as the 'rescued' man or the little girl, frequently includes masking sounds that become obstacles to navigation since they obscure the cues.

The most important sounds in the game, after the footsteps, are the *trigger* sounds and the *orientation* sounds. Examples of trigger sounds include:

- a joyful bell when one collects a musical note
- the exit sound: a sparkly "composite sound-object including bell-like, musical notes and whistling sounds" towards which one navigates to end a level
- entry to level sounds (e.g. low violins, level 3)
- 'dying' sounds (e.g. snuffle hog attacks)
- danger sounds, such as the 'finger bones'/squeaky toys (level 3), the wooden and metal strips on the floor at level 13, the chessboard squares (alternating silent and noisy) in level 14, or the xylophone road (level 16).

Orientation sounds include ticking clocks, snoring hogs, iterative bells, dripping water and a host of other locative clues. Above all, one tries to navigate towards the musical notes: in *Papa Sangre,* the gamer is constantly heading towards the abstraction of music, accompanied by the metaphysical FWT and drawn by the spectral Papa Sangre. The narrative journey, paradoxically, is away from the diegetic towards the non-diegetic.

Enemies are characterised by the sounds they make, which are occasionally extended to include technology (such as the reaper's scythe in Level 9), and *obstacles* similarly have a direct sonic effect that is quasi-diegetic (such as the "squishy guts" of level 7). A more ambiguous role is played by the various

distracting or *masking* sounds, such as: swarming bees or bugs (level 2), splashing water (level 8), screaming bird (level 8), chickens (level 19), and the fake bells of level 24 from amongst which one must distinguish the Fate Bell. These become both obstacles and part of the soundscape, and their purpose is simultaneously navigational and incidental to the general game-play.

Music, as we have seen, operates in a similarly ambiguous way, being quasi-non-diegetic at first but shifting into a more diegetic soundscape function. Two other aspects of the game that are not covered by the critical literature are *haptic* clues (in the case of *Papa Sangre* a phone 'rumble' when one hits a wall), which form part of the navigational game, and the curious invitations to *synaesthesia* offered during the game narrative, such as the FWT's comment: *"That piercing feeling is fangs. That smell is the rotten breath of a hungry hog".* The syanesthetic invitations remind one that *Papa Sangre* has as much in common with radio drama as with film. The game subsumes both text-based adventure games and console games within its essentially radiophonic sound-world.

To conclude this essay, we will examine the beginning of a level of captured gameplay, using the toolset created by Pierre Couprie in his EAnalysis software. The level in question is Level 3, The Kennel. The gaming experience may be summarised verbally as follows:

> Low violins comprise the entering soundscape of Level 3. The voice of the TWF begins: "You are at the entrance to the palace of bones. It is guarded by a hog (hog's snoring). The hog is asleep in the kennel next to a musical note. The hog will eat you if it catches you. If you trip and fall, the hog will wake and chase you (animal growling and running away?)."

Fear is preeminent by the appearance of the hog (= danger), which is depicted through two distinctive sounds escorting the narration: the sound of hog's snoring and the sound of hog's attacking. That makes me more alert in order to avoid a "fatal" mistake.

At this stage I am aware that walking towards the wrong place my "death" will surely come, so I listen carefully. To locate the position of the animal growling in the distance it is not an easy task. Now, I hear the first note I need to collect, blinking in the distance on the right. I turn the wheel to the right and walk toward the note; I hear the snuffle hog growling in the distance. I turn until I hear the musical note placed at the centre. I still do not know if the growling is in close distance to me. As I walk toward the note, the growling snuffle hog's sound gets louder and suddenly I am listening (terrified) as the snuffle hog eats 'me' (I now know it is a male character) while I scream desperately. The whole situation is annoying as I hear the sounds of the snuffle hog eating me. But, the TWF says:

"Careful near a snuffle hog. If it catches you, it eats you. But your soul remains to try again in a new body" (metallic sound follows that statement and a sound of a drop).

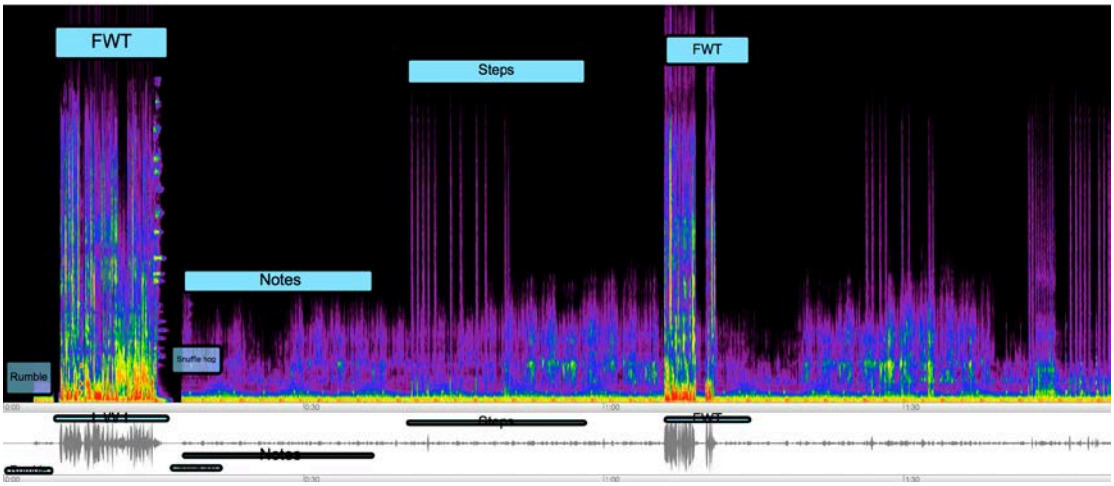

Figure 3: Level 3, start

Figure 3 shows the start of the level, indicating the stratification of sounds that enable clear identification of each element. The low 'rumble' at the start continues throughout the level, creating a sustained menacing atmosphere that is typical of survival horror. However the level is both low in pitch and amplitude, giving it immediately a quasi-non-diegetic environmental status. At this stage in the game, such 'atmospheric' sounds do not interfere with the gameplay. The FWT's instructions are voiced by a female, giving the high pitch, but are also very prominent, overriding all other signals.

The musical note is pitched at C5 on this occasion. The musical notes vary in pitch and instrumentation throughout the game, creating the semblance of a melody, although this is never heard in its entirety. As may be seen from the sonogram, the note is periodic and repetitive, but with a sharp attack and only slight decay. This shape makes it quite distinctive even at the low levels that occur when the player loses 'sight' of it or some other sound intrudes upon it.

The pace and orientation of the loud footsteps are controlled by the player, so their peaks are high but their pacing is irregular. These are always

heard at the same level of amplitude, since they represent the presence of the gamer. What is not conveyed by the sonogram is the orientation, which changes as the player moves the wheel. This orientation affects the gameplay. In this example the gamer comes to an uncertain standstill at 0' 51". Realising this after a short time, the FWT reappears with further encouragement and instructions.

Notice how there are four elements present during any period of time. This is a pattern that is maintained throughout the game and is presumably derived from the well-documented psychoacoustic phenomenon that four layers of sound are in general the maximum that may be perceived separately by the average listener (Landy 2012, 108). In practice, the perceptual aspects for the gamer are limited to the orientation and trigger sounds only, since environmental and footstep sounds give little new information. Consequently, as the game increases in difficulty, the number and complexity of orientation and trigger sounds increases as the game evolves.

Conclusion

In her study of 'play along' games, Kiri Miller remarks how virtual performance games such as *Guitar Hero* and *Rock Band* "foster a creative, imaginative listening orientation in which the players feel responsible for producing the music through moment-to-moment embodied engagement with the "inner time" of the song" (Miller 2012, 111). There is a parallel here with the heightened listening and pleasurable manipulations described by the players of *Papa Sangre.*

Most studies of audio-only gaming (e.g. Friberg and Gärdenfors 2004; Röber and Masuch 2007; Roden et al. 2007; Papworth 2010; etc.) have

concentrated upon design and technical issues, with minimal discussion of aesthetic content. Music analysis has almost completely avoided the genre. But, at its best, the playing of *Papa Sangre* can become an act of performance, or even composition, as one orients oneself within the sonified world. Players repeatedly referred to improving their "performance" with reference to sound manipulation and especially to the importance of sonic or musical memory:

> The experience of playing Papa Sangre created vigilance in regards to memory, where one should always remember the instructions/clues given only through sound. For example, a direction one needs to take towards a particular path in a video game is clear due to the sense of vision; you see the path and you go. In Papa Sangre, the "path is related to a sound(s) and the player uses his sonic-memory in order to complete his goal.

In another context (such as improvisation), this would pass perfectly well for a description of music-making.

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