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"Time for New Terminology? Diegetic and Non-Diegetic Sounds in Computer Games Revisited"

Game Sound Technology and Player Interaction:
Concepts and Developments

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Chapter 5
Time for New Terminology?
Diegetic and Non-Diegetic Sounds in Computer Games Revisited

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ABSTRACT

This chapter is a critical discussion of the use of the concepts diegetic and non-diegetic in connection with computer game sound. These terms are problematic because they do not take into account the functional aspects of sound and indicate how gameworlds differ from traditional fictional worlds. The aims of the chapter are to re-evaluate earlier attempts at adapting this terminology to games and to present an alternative model of conceptualizing the spatial properties of game sound with respect to the gameworld.

INTRODUCTION

Two concepts from narrative theory that often appears in discussions about game sound are *diegetic* and *non-diegetic* (Collins, 2007, 2008; Ekman 2005; Grimshaw 2008; Grimshaw & Schott 2007; Jørgensen 2007b, 2008; Stockburger, 2003; Whalen, 2004). The terms are used in film theory to separate elements that can be said to be part of the depicted fictional world from elements that the fictional characters cannot see or hear and which should be considered non-existent in the fictional world (Bordwell, 1986; Bordwell & Thompson, 1997). According to this approach, dialogue be-

tween two characters is seen as diegetic, while background score music is seen as non-diegetic. In connection with game sound, a likely adaptation of these concepts would describe the response "More work?" from an orc peon unit in the real-time strategy game *Warcraft 3* (Blizzard, 2002) as an example of a *diegetic sound* since it is spoken by a character within the gameworld. Music that signals approaching enemies in the role-playing game *Dragon Age: Origins* (Bioware, 2009) would according to this view be an example of *non-diegetic sound* since the music is not being played from a source within the game universe.

However, when analyzing the examples more closely, we see that using these terms in computer games is confusing and at best inaccurate. As a

response to a player command, the "More work?" question has an ambiguous status in relation to the gameworld: If we ask ourselves who the peon is talking to, it appears to address the player, who is not represented as a character in the gameworld, but manages the troops and base from the outside of the gameworld. The warning music heard in the role-playing game is also ambiguous. Although there is nothing to suggest that the music is being played by an orchestra in the wilderness, there is no doubt that the music influences the players' tactical decisions and therefore has direct consequence for the player-characters' actions and the progression of the game. The confusion comes into being because game sound has a double status in which it provides usability information to the player at the same time as it has been stylized to fit the depicted fictional world. It works as support for gameplay, while also providing a sense of presence in the gameworld (Jørgensen, 2007a, 2009; Nacke & Grimshaw, 2011). From this point of view, diegetic and non-diegetic sounds tend to blend systematically in games, thereby creating additional levels of communication compared to the traditional diegetic versus non-diegetic divide.

Although sound may be categorized and discussed in several ways, the diegetic versus non-diegetic divide may be especially attractive for describing modern computer games since they are set in universes separate from ours and that on the surface remind one of the fictional universes of film and literature. This makes the terminology seem like an illustrative approach for describing auditory properties with respect to the represented universe in games. The concepts enable us to separate what is perceived as internal to that universe from what is perceived as external to it. However, as this chapter will argue, the concepts of diegetic and non-diegetic are developed with traditional media in mind, and are therefore confusing and misleading when attempts are made to uncritically transfer them to computer games. First, the participatory role of the player is not accounted for in this theory, which

means that the functional aspects of game sound therefore disappears when applying diegetic and non-diegetic to game sound. Also, gameworlds cannot be appropriately described by these terms since they are designed for different purposes than traditional fictional worlds. Since gameworlds invite users to enter their domains as players, they are qualitatively different from other fictional worlds, and this makes the traditional diegetic versus non-diegetic divide problematic when applied to computer games. While the aim of the chapter is to evaluate the use of the two concepts in relation to game sound, the chapter will also be a revision of my earlier theory on *transdiegetic sounds* (Jørgensen, 2008b). I will discuss my own and other attempts at adapting the concepts to game sound, based on the original meaning and uses of *diegesis*, and present an alternative way of conceptualizing the phenomena in relation to game sound. The main argument of this chapter rests on two principles. One is that the participatory nature of games allows the players a dual position where they are located on the outside of the gameworld but with power to reach into it. The other is that gameworlds differ from traditional fictional worlds in fundamental ways as they are worlds intended for play. This difference requires game sound to be evaluated on terms other than those used for analyzing film sound.

A short reader guide is appropriate. The chapter is organized according to principles of clarity where an overview of earlier theory creates the basis of the argument and, in order to get the most out of the chapter, it should be read from beginning to end rather than being dipped into. I will introduce the chapter with a discussion of the origin and application of diegetic and non-diegetic in traditional media before going on to present other attempts at categorizing game sound (Collins, 2007, 2008; Huiberts & van Tol, 2008; Stockburger, 2003; Whalen, 2004). Next, the chapter will review different attempts to adapt diegetic terminology to games (Galloway, 2006) and game sound (Ekman, 2005; Grimshaw,

2008; Jørgensen, 2007b). I will then discuss how gameworlds separate themselves from traditional fictional worlds and that this has consequences for the way we interact with them (Aarseth, 2005, 2008; Klevjer, 2007), and consequently for the application of diegetic and non-diegetic. The last section of the chapter will present an alternative model for analyzing game sound in terms of spatial integration. Throughout the chapter, I will also use data from research interviews with empirical players where this is appropriate. The data concerns player interpretations of so-called transdiegetic features in computer games, and support the idea that gameworlds work on premises other than traditional fictional worlds.

Although this chapter focuses on the auditory aspect of games in particular, it should be noticed that the discussion about the relevance of diegetic and non-diegetic features does not concern auditory features alone. However, sound is particularly interesting for several reasons. Since sound is neither tangible nor visible, and has a temporal quality, it has the ability to remain non-intrusive even when it breaks the borders of the gameworld. The ability to seamlessly integrate with the gameworld gives it the opportunity to challenge the relationship between diegetic and non-diegetic in a way that visual information cannot.

BACKGROUND

Diegetic vs. Non-Diegetic Sound

The term diegetic originally stems from *The Republic*, where Plato separates between two narrative modes that he calls *diegesis* and *mimesis*. Diegesis, or *pure narrative,* is when the poet "himself is a speaker and does not even attempt to suggest to us that anyone but himself is speaking"; while mimesis, or *imitation,* is when the poet "delivers a speech as if he were someone else" (Plato in Genette, 1983, p. 162). According to film scholar David Bordwell (1986), the term

diegesis was revived in the 1950s to describe the "recounted story" of a film, and today it has become the accepted terminology for "the fictional world of the story" (p. 16). According to this terminology, diegetic sound is represented as "sound which has a source in the story world", while non-diegetic sound is "represented as coming from a source outside the story world" (Bordwell & Thompson, 1997, p. 330). Game scholars who use diegetic and non-diegetic when describing game sound, tend to take their point of departure from this newer, film theory understanding of diegesis, and extend the meaning of the "fictional world of the story", to the universe of the game. As mentioned, this is confusing since it implies that the gameworld is a storyworld, and is misleading because game sound works for different purposes compared to film sound. These points will be in focus in the following discussion that critically evaluates the use of diegetic and non-diegetic in relation to computer game sound.

Of course, the debate about the relationship between diegetic and non-diegetic features is not unique to game studies. Also, film theory sees the limited ability of this theory to precisely describe sound. While David Bordwell and Kristin Thompson (1997) define non-diegetic sound as "represented as coming from a source outside the story world" (p. 330), Edward Branigan separates non-diegetic features into *extra-fictional* and *non-diegetic.* He argues that when a piece of background film music is accompanying the credits of a film, it should be interpreted as extra-fictional, but when it accompanies a series of shots from a nightclub, and is thus presented as typical of an evening at that location, it should be interpreted as non-diegetic (1992, p. 96). In this view, Branigan claims that non-diegetic sound is related to the diegesis, but does not correspond to the fictional characters' experience of it (1992, p. 96), while extra-fictional sound exists outside the diegesis and is required to talk about the diegesis *as* fictional (1992, p. 88). Although not accounting for the participatory nature of games, Branigan's view

of non-diegetic is more sympathetic towards how, for instance, score music works in games, since there is some kind of bond between the sound and what happens within the diegesis.

When discussing film music, Michel Chion also points out that the non-diegetic category is complicated. A central reason, in his view, is that so-called diegetic music, like non-diegetic music, may have a commentary function meant to help the interpretation of what is going on in the film. Chion's own example is Siodmak's *Abschied*, in which the protagonist's emotional states are being punctuated by the music of his pianist neighbor, thereby questioning the non-diegetic state of the music. Because of such ambiguous cases, Chion argues that the reference to diegetic and non-diegetic music is misleading, and uses *pit music* and *screen music* instead. While pit music "accompanies the image from a non-diegetic position, outside the time and space of action", screen music refers to "music arising from a source located directly or indirectly in the space of time" (Chion, 1994, p. 80). From this approach, screen music could also be used to describe the computer game version of *leitmotifs* (Gorbman, 1997, pp. 3, 26-29), in which music with an apparent non-diegetic source warns the player about dangers.

The relationship between diegetic and non-diegetic is not a simple one in literary theory either. One example of this is provided by Gerard Genette, who points out that the diegetic and non-diegetic levels often blend together in the act of narration. He uses the term *metalepsis* to describe any transition from one diegetic level to another. While the classics used the term to refer to "any intrusion by the non-diegetic narrator or narratee into the diegetic universe" (Genette, 1983, pp. 234-235), Genette extends the term and calls all kinds of narrative transitions of elements between distinct levels of the literary diegesis *narrative metalepsis*". In literature, these transitions range from simple rhetorical figures, where the narrator addresses the reader, to extremes in which a man is killed by a character in the novel he is reading.

However, being closely connected to the act of narration—how a story is told—metalepsis only serves as a comparative illustration for the trans-boundary movement that happens in computer games.

These methods of categorization show that the relationship between diegetic and non-diegetic sound is not without debate in film theory and literary theory but, while the concepts work as a point of departure and as a common ground for understanding the narrative levels of traditional fiction, they create confusion in connection with computer game sound because of the participatory nature of games and gameworlds (Collins, 2008, p. 180; Jørgensen, 2006, p. 48, 2007b, p. 106). In films and computer games equally, sound cues the media user's understanding of the environment, direction, spatiality, temporality, objects and events. However, film sound is limited to informing the audience as to how to interpret what is going on in an inaccessible world while game sound provides information relevant for understanding how to interact with the game system and behave in the virtual environment that is the gameworld (Jørgensen, 2008). This means that game sound has a double status in which it provides usability information to the player at the same time as it has been stylized to fit the depicted universe. This may create confusion with respect to the role of the sound since it appears to have been placed in the game from the point of view of creating a sense of presence and physicality to the game universe while it actually works as a support for gameplay. A comparison serves as illustration. When the players of *The Elder Scrolls III: Morrowind* (Bethesda, 2002) hear the music change when navigating through a forest, they know that an enemy is approaching, and may act accordingly. However, since this music has no source in the gameworld, the player character should not be able to hear it, but since the player does hear it and may act upon it, the character also seems to act *as if* it knows enemies are approaching even though it does not yet see them coming. In this sense, sound

that appears to be non-diegetic affects diegetic events, thereby disrupting the traditional meaning of diegetic and non-diegetic sound (Jørgensen, 2007b). In *Pulp Fiction* (Tarantino, 1994), on the other hand, one of the characters is sitting in his car accompanied by what at first appears to be non-diegetic music. Suddenly he starts whistling along with the music. In this case, the audience is not led to believe that the character hears music that is not present; instead, they re-interpret the music not as non-diegetic, but as diegetic music played on the car radio.

On the surface, the situations from the game and the film may appear similar, but in terms of how it affects its context, there is a huge difference between the film music and the game music: In the case of the film music, we revise our interpretation when we realize that the fictional character actually can hear it (Branigan, 1992, p. 88). There is therefore never any ambiguity connected to the origin of the music, and we are never led to believe that the character hears music that is not present in his world. The game music, on the other hand, has a functional value related to the game system: it provides a warning to the players about a change in game state: namely that an enemy is aware of their presence and about to attack. In this sense, the role of game music is to enable the player to use its informative value to make progress in the game. In this respect, film music and game music have fundamental different roles. While film music provides clues about moods, upcoming events, and how to interpret specific scenes, game music works as a user interface that provides usability information that helps players progress in the game. Also, while non-diegetic film music never allows the audience to change the protagonists' behavior or to save them from certain death, game music can enable the player to guide their avatar away from danger or to make them draw their sword even before the enemy has appeared. This is, of course, a direct result of the difference between players and audiences and it puts emphasis on the fact that the concepts of diegetic and non-diegetic

have not been designed to take this difference into account, and is therefore not sufficient for analyzing sound in computer games.

Categorization of Game Sound

There have been different attempts to categorize game sound and, in this section, I will present some of the most fruitful endeavors. Although only a few scholars base their descriptions on whether or not sounds are diegetic and non-diegetic, many refer to the concepts and may in some cases use them as unambiguous ways to look at sound. This section will provide a short overview of such scholarly attempts before the next section goes on to discuss specific attempts to adapt diegetic and non-diegetic concepts to game sound.

Alex Stockburger (2003) was perhaps the first academic that came up with a method of categorization for game sound. He defines a number of "sound objects" according to their use in the game environment, and separates between *score sound objects, zone sound objects, interface sound objects, speech sound objects*, and a range of different *effect sound objects* connected variously to the avatar, to objects usable by the avatar, to other game characters, to other entities, and to events. Although Stockburger emphasizes the importance of understanding the functional role of sound, his categories do not cover this. Instead, his model describes sound according to what kind of object it is connected to in the game engine. He also uses diegetic and non-diegetic as matter-of-fact and straightforward concepts and does not discuss how they should be interpreted in terms of game sound. One who does argue that diegetic concepts can be usefully applied to game sound is Zack Whalen. He states that non-diegetic game music has two functions; to "expand the concept of a game's fictional world or to draw the player forward through the sequence of gameplay" (2004). In other words, it can either support the sense of spatiality and presence in the game environment, or support the player's progression through the

game. His approach is interesting as it takes into account the fact that game music provides information relevant for gameplay, but by being tied to the traditional meaning of non-diegetic it is equally misleading as other adaptations of the concepts.

A scholar who does see the diegetic/non-diegetic division as complicated is Karen Collins (2007, 2008). She points out that the division between diegetic and non-diegetic sound is problematic since the player is engaging in the on-screen sound playback process directly (2008, p. 125). Her separation between *interactive* and *adaptive* sound is based on functionality. Whereas interactive sound refers to sound events occurring in response to player action, adaptive sound reacts to events in the environment (2007, 2008, p. 4). In this respect, sound is understood as a dynamic feature closely related to events, at the same time as it takes into account the agency of the player. Huiberts & Van Tol (2008) also point out that using diegetic and non-diegetic is complicated in connection with game sound, since interactivity allows non-diegetic sounds to affect diegetic events. They still decide to use the terms because they see them as established within game studies. By putting diegetic and non-diegetic in context with *setting* and *activity*, their IEZA framework takes into account the interactive aspects of game sound, but does not take into consideration that gameworlds are designed for different purposes compared to diegeses, and that they therefore influence sound in a different way.

There are also other models for describing sound in this anthology. Wilhelmsson & Wallén's (2011) general framework for sound design and analysis combines theories of listening with both the IEZA framework and Murch's description of five layers between "encoded" and "embodied" sound in film ranging from speech to music via effect sounds: However, like many others, they take the fruitfulness of diegetic and non-diegetic for granted. In his discussion of diegetic music, Berndt (2011) claims that what he calls *visualized music* must be considered diegetic. This is the

visualization of structural features of a musical composition, exemplified by the stylized visualization of patterns found in the user interface of music games such as *Rock Band* (Harmonix, 2007) and *Electroplankton* (Indies Zero, 2006). From the point of departure of this chapter, this view of diegetic is problematic, since it distances itself from the original use of diegesis and thereby creates confusion. Milena Droumeva, on the other hand, outlines a framework of game sound according to "realism" in terms of fidelity and verisimilitude, and connects these to acoustic ecology and Barry Truax' idea of an *acoustic community* that includes physical world sounds that have an impact upon gameplay. Examples of this are the acoustic soundscape of group play, and online conferencing ("live chat") (Droumeva, 2011). From this perspective, she argues that the use of diegetic and non-diegetic terminology is limited because it fails to acknowledge the importance of these kinds of sounds. Although a valid point when discussing the general soundscape of the gaming activity, this point has only limited value to the argument of this chapter, since it is restricted to how game internal sound works with respect to the gameworld, and only briefly mentions externally produced sounds.

Diegetic Theories of Game Sound

Some of the more critical attempts at adapting diegetic and non-diegetic to games have resulted in analyses that show that game sound has more significant layers of meaning than can be explained by using the terminology above. In this section, I will evaluate the most comprehensive of these adaptations and discuss their strengths and weaknesses. However, even though the following accounts are attentive to how the concepts of diegetic and non-diegetic when used for describing games differ from how they are used for films, emphasizing this difference may lead to a situation in which one keeps leaning too heavily on a terminology that is meant to describe film sound, without be-

ing able to free oneself to establish a new model designed to take the particular characteristics of game sound into account.

A game scholar that partly succeeds in using diegetic and non-diegetic in his description of games is Alexander Galloway (2006). Focusing on games as activities, he couples the terminology with his own terminology of whether it is the player (*operator*) or game system (*machine*) that performs the act. His model describes all actions as executed either inside the "world of gameplay" or outside of it and whether it is the player or the game system that takes a specific action. In this way, he describes all actions from the player firing a gun to configuring the options menu, from the movements of non-playing characters to the spawning of power-ups. While the categories themselves are not crucial to this chapter, Galloway's *perspective* is important. He emphasizes the fact that games are activities and that they must be described as such. He also states that when diegetic and non-diegetic are used in connection with games the meaning of the terms changes (Galloway, 2006). However, even though he points this important fact out, Galloway's use of these terms is somewhat confusing since he, like I do with the term *transdiegetic*, tries to change the concepts from describing the relative positioning of features in space to describing actions. The model is worth mentioning, however, since the action-oriented perspective supports sound by focusing on temporality: that is, like sound, action is time-based.

Galloway's approach to diegesis as a "world of gameplay" is also closely related to Mark Grimshaw's radical modification of what should count as diegetic sound in computer games. He extends the idea of diegetic sound compared to film theory, and states that in computer games, diegetic sound is "defined as the sound that emanates from the gameplay environment, objects and characters and that is defined by that environment, those objects and characters", and that it must "derive from some entity of the game during play" (Grimshaw,

2008, p. 224). In this respect, sounds do not have to be placed within the game environment in a way that we recognize from the physical world. In other words, as long as the referent is diegetic, the signal does not need to be. There is no need to have a character in the gameworld that produces the sound for it to count as diegetic. For Grimshaw, sounds are diegetic as long as they relate to actions and events in the gameworld. He exemplifies by pointing out that sounds signaling the entrance or exit of players in a multiplayer game should be considered diegetic since they concern entities in the game environment and affect their behavior. Based on this understanding, Grimshaw elaborates that diegetic game sounds are not limited to sounds that exist in the gameworld but that we also need to take into account all sounds that provide information relevant for understanding the gameworld. In effect, this would also include the traditional background music that signals an enemy about to attack in *The Elder Scrolls III: Morrowind*, and disembodied voiceovers in *Warcraft 3*. By introducing additional new concepts that specify whether a sound is heard by a specific player (*ideodiegetic* sounds), and whether such a sound results from the player's haptic input or not (*kinediegetic* versus *exodiegetic* sounds) (Grimshaw & Schott, 2007; Grimshaw, 2008), Grimshaw creates a game-specific terminology that recognizes its theoretical relationship to the diegetic or non-diegetic divide. A concept that is particularly interesting is what he calls *telediegetic* sounds. Connected to multiplayer situations, these are sounds produced by one player and of consequence for a second player who does not hear that sound. While it may be seen as a paradox to call this information auditory when it is in fact *the action* of the first player that affects the second player, the concept has interesting implications. If we detach the concept from the idea that it must be heard by a first player, it may be extended to all situations in which players appear to react to a sound that they do not hear, such as is the case when players apparently react to the traditionally

speaking non-diegetic music of approaching en-
emies. However, even though Grimshaw's theory
emphasizes all sounds that have relevance for
player actions in the gameworld, it is confusing
that he still insists on using the concept *diegetic*
also for sounds that appear to have no source in
the game environment and that the avatar should
not be able to hear. In any respect, Grimshaw's
extension of what counts as diegetic, and his focus
on the player in relation to the concept, are strong
arguments for exchanging the existing terminol-
ogy with new.

In my Ph.D. research (Jørgensen, 2007a, 2009),
I developed a model of categorization that took
into consideration *functionality* with respect to
usability and type of information, *location* with
respect to the gameworld, and *referentiality* with
respect to the relationship between sound signal
and the event it refers to (2007a, pp. 84-87). In Jør-
gensen (2008), the model was further developed to
include what *generates* a specific sound. However,
in describing the location of sound with respect
to the gameworld, these models both included
references to the diegetic/non-diegetic divide by
the use of the neologism *transdiegetic* sounds
(Jørgensen, 2007b). This approach described
sound as transdiegetic by way of transcending
the border between diegetic and non-diegetic:
Diegetic sounds may address non-diegetic entities,
while non-diegetic sounds may communicate to
entities within the diegetic world. Such sounds
have an important functional value in computer
games by being an extension of the user interface
and providing information such as feedback
and warnings to the player. Utilizing the border
between diegetic and non-diegetic, transdiegetic
sounds merge game system information with the
gameworld and create a frame of reference that
has usability value at the same time as it upholds
the sense of presence in the gameworld. Using this
terminology, I argued that apparently non-diegetic
music that provides information relevant for player
action in the gameworld is *external transdiegetic*
since the musical source is not found within the

gameworld but is external to it. The same goes
for the disembodied warning "Our base is under
attack!" in *Warcraft 3*. It is external transdiegetic
because it provides information relevant to player
action, but is not produced by anyone within the
gameworld. When the avatar in *Diablo 2* (Bliz-
zard, 1998) claims "I'm overburdened", however,
I called the sound *internal transdiegetic* because
the avatar as a character existing in the gameworld
communicates to the player situated in an external
position. The strengths of transdiegetic as concept
are that it emphasizes the functional role of the
sound in relation to player action in the gameworld,
and it points out that the spatial origin of the sound
is often relative. It is also able to describe all game
sounds by using the same framework. However, it
is confusing that it is based on the term diegesis,
which creates connotations to the mechanisms of
narratology and storytelling. Also, the internal and
external variations are flawed as they appear to
be two variations over the same theme, while in
reality they are not. While internal transdiegetic
sounds can easily be interpreted as abstractions of
"diegetic" sounds since they are partly integrated
into the game environment, external transdiegetic
sounds are externally situated but with clear impact
on the game environment.

Inger Ekman's approach to game sound (2005)
is closely related to that of transdiegetic sounds.
Common to Ekman's and my account is the idea
that the space of the gameworld is not absolute,
and that information is carried across its boundar-
ies. Another common ground is the idea that game
sounds are used to integrate the game system into
the environment in which it is set. From a semiotic
perspective, she observes that game sounds that
traditionally would be labeled diegetic, often have
non-diegetic referents, and vice versa. In this re-
spect, computer game sound is not limited to being
diegetic or non-diegetic, but creates two additional
layers that may be used to integrate non-diegetic
elements connected to the game system into the
diegetic world of the game. *Masking sounds* is her
term for diegetic sound signals with non-diegetic

referents. Such sounds appear to be produced in the gameworld, while its referent is a mechanic of the game system. An example of a masking sound can be found in *World of Warcraft* when a monster attacks the avatar preemptively. In such cases, a sound specific for that monster will be heard that signals to the player that the avatar has entered the aggression zone of that monster. This sound is hard to interpret as natural to the world of the game since no animal would signal to its prey that it is about to attack. Being represented by a sound signal with a source in the gameworld, the sound has the ability to mask its origin as a system message by being integrated into the gameworld, and thus becomes situated on the border of what is traditionally seen as the diegesis. Ekman calls a sound *symbolic*, however, in cases where the signal is non-diegetic and the referent is diegetic. An example of this is adaptive game music that is not produced by a source in the gameworld, but refers to an event in the gameworld, such as is the case when the player suddenly hears the music change when an enemy is about to attack in *Dragon Age: Origins*.

Although Ekman's model is fruitful in explaining how game sound relates to the traditional film theory understanding of diegetic and non-diegetic sound, it also demonstrates the problematic aspects of applying these concepts to games because game sound in many cases is only partially diegetic. Also, there are many examples of sounds that cannot be fully explained by Ekman's model. When a voice that apparently belongs to the avatar proclaims that "I'm overburdened" in *Diablo II*, it is not certain whether signal and referent are diegetic or not. While the signal gives the impression of being diegetic due to the use of the first person personal pronoun and the fact that it is produced by a voice that seems to belong to the avatar, it may also be interpreted as a non-diegetic system sound masked as diegetic since it is unclear who the avatar is talking to (itself or the player?) and since it provides information about the inventory, which is the game system feature that allows the

player to collect and store items in the game. This interpretation was suggested by two player respondents in my research on the topic of trans-diegetic communication:

[...] Well, it is the character's voice saying this. But still I don't get the feeling that it is the character speaking. It's like the game narrator's voice provides the player with a hint that, okay, you should check your inventory. [...] (John, (30). Individual interview, Dec 10, 2008.)[1]

It's a like some sort of error, or a... if you want to see her as an individual person, it's really an error. Because then the question is, who is she talking to? [...] (Isabel (25). Individual interview, Dec 1, 2008.)

While John sees the above sound signal as a system message masked as diegetic, Isabel thinks of it as an error since it is unclear who the avatar is talking to. In this case, the referent is also ambiguous in the same way as it is not clear whether the sound refers to the fact that the avatar is trying to pick up something in the gameworld but fails or to the fact that the inventory is overloaded. *Warcraft 3* provides another example. When the player tries to place a new building on an illegal location, a disembodied voiceover says, "Can't build there!" At first glance, the signal seems to be non-diegetic since there is no character in the gameworld that produces the sounds. However, this is challenged by the fact that the voice and the accent are very similar to the voices of the other units of that race. The referent is even more ambiguous: while the sound refers to an operation that is illegal according to the game system, it also refers to the fact that this specific location in the gameworld has diegetic properties such as trees or existing structures that makes it impossible to build here.

As has been demonstrated in the above discussion, the attempts to adapt the concepts diegetic and non-diegetic to game sound point to interesting

aspects that recognize the specificities of game sound compared to sound in other media. At the same time, however, these attempts also demonstrate that the use of concepts designed to explain traditional media is problematic and confusing. There is a need to invent a terminological apparatus that fully grasps the uniqueness of game sound without trivializing it or confusing it with related, but different, features in other media. However, what the adaptations above have in common, is seeing game sound as qualitatively different from sound in other audio-visual contexts. Specifically, there is a tendency to pay attention to the interactive nature of game sound and to see it as a part of the *user interface* of the game in that it provides information to the player that helps feedback and control (Saunders & Novak, 2006). These adaptations also suggest that gameworlds operate in a different manner compared to storyworlds. This is particularly evident in Grimshaw's extended understanding of diegetic sound as all sounds that derive from a gameplay event. In the following I will discuss how the understanding of game sound as interface, and the gameworld as a different construct to traditional diegeses, affects the idea of diegetic sound and I suggest alternative ways of discussing the relationship between the gameworld and game sound.

SOUND AND THE GAMEWORLD

I have suggested above that diegetic and non-diegetic are problematic in connection with games and game sound because gameworlds are different constructs compared to traditional fictional worlds, or diegeses, and because of the way the players interact with them. In this section I will go into the characteristics of gameworlds, what makes them different from traditional fictional worlds, and what consequences this has for understanding their sound usage.

Rune Klevjer rejects using the term diegesis to describe gameworlds due to its link to storytelling, and argues that gameworlds are radically different from storyworlds because they are worlds *designed for playing games*. This means they are unified and self-contained wholes, structured as arenas for participation and contest, and are therefore subject to a coherent purpose (Klevjer, 2007, p. 58). Such worlds are created around a different logic than "fictional storyworlds" and, as long as all elements are explained as being parts of the game system, they do not need to be explained as a credible part of a hypothetical world. Espen Aarseth (2008) makes a clear distinction between gameworlds and fictional worlds by stating that the virtual world of *World of Warcraft* (Blizzard, 2004) is no fictional world but instead "a *functional and playable gameworld*, built for ease of navigation" (p.118). This is also emphasized in Aarseth (2005) in which he describes the environmental design of *Half-Life 2* (Valve, 2004). It is a carefully designed environment with a specific layout that guides the players through specific areas, and limits the freedom of navigation in order to set up the challenges of the game, at the same time as it is given properties that remind one of the physical world in terms of world-representation. I want to follow up on Klevjer's and Aarseth's approaches and further point out that gameworlds are universes designed for the purpose of playing games. This means that they are fitted for very specific uses, and their layouts are decided in terms of functionality according to the game system. Environmental features and dungeon layouts are not created randomly but, because of careful design, they are oriented towards a specific gameplay experience. This view will be the starting point for the following discussion that will focus on the functional aspects of gameworlds and sounds connected to it. As we will see, this view of the gameworld is important for understanding how sound is used, and explains why players do not see what I earlier called *transdiegetic* sounds as interfering.

As different constructs compared to traditional fictional worlds, gameworlds operate on other

premises. One characteristic of gameworlds is that they need to have a comprehensive system for player interaction. They need to be able to communicate necessary information about changes in game state and allow the player the necessary degree of control. Many of these interface features, including sounds, are often added to the game as abstractions of specific game mechanics partly integrated into the gameworld and, as that, it is problematic to see them as either diegetic or non-diegetic in traditional terms. Instead of looking at what would be a credible representation of a naturalistic world, we should look at how the gameworld and the game system work to support each other. If the game rules state that monsters growl when attacking, and that individuals respawn with their amour 10% damaged after being killed, this is the premise of the specific gameworld. This is a view that is a familiar one for empirical players. One of the player respondents in my empirical research states it thus:

[...] In this world, you can define whatever you would like there to be, it doesn't seem that things are very credible in themselves.

Q: So why do we accept it?

Because it's a game. And that is something completely different from a film. (Isabel (25). Individual interview, Dec 01, 2008)

Here Isabel emphasizes the idea that gameworlds do not need to be a credible alternative to other fictional worlds, and that game designers can decide what they want to include as existent in their world: Because they are integrated with the game system, gameworlds are necessarily different from fictional worlds, such as films. This interpretation supports Grimshaw's extended view of what counts as diegetic in computer games, but at the same time it amplifies the problematic aspects of using diegesis as explanatory terminology,

since gameworlds functionally are very different from literary or cinematic diegeses.

Based on the above, the upholding of the game system by the gameworld also has consequences for the integration and design of sound in games. All game sounds have a function with respect to the gameworld, be it to provide information relevant for gameplay or to provide a specific atmosphere. Specific games and genres use sound in different ways and the degree to which it is incorporated into the gameworld plays an important role for reasons of clarity and consistency and in order to create an immediately understandable relationship between the sound and the gameworld. When designing user interfaces for games, a designer needs to decide how to present information to the player. Central to this is deciding which menus that should allow interaction or not, how and whether the user interface should be integrated into the gameworld, and how sounds and visual elements should work together. Game designers Kevin Saunders and Jeannie Novak (2006) describe two ways of relating the user interface to the gameworld and the gamespace. A *dynamic interface* supports the idea that all audio-visual aspects of a game should be seen as interface because they all provide the player with some kind of information, and dynamic interfaces are therefore completely incorporated into the gameworld. An example is the way an avatar's amour and weapons provide information in a massively multiplayer online game (MMO)[2] like *World of Warcraft*: By looking at what gear the opponent has, a player receives vital information about class, level and power of that avatar. A *static interface*, on the other hand, is an overlay interface that consists of external control elements such as health bar, map, pop-up menus, inventory, action bars and so on. Since user interface and gameworld often tend to merge, making the boundary between gameworld and interface relative (Jørgensen, 2007b, 2008, 2009), the static/dynamic divide should not be seen as absolute, but as a continuum where the interface may be more or less integrated

into the gameworld. Used as an interface, sound often takes on a relativistic position where it is integrated into the gameworld while remaining part of the game system. Using sound signals that are based on real world sounds, but which have been stylized, user interface designers add sounds that provide the necessary usability information at the same time as ensuring the sounds seem natural to the environment of the game. Ekman's masking sounds are textbook examples of this. Another example is the response "More work?" by *Warcraft 3*'s orc peons. As a verbal statement produced by a character in the gameworld, it has a direct link to that gameworld, but at the same time it is an interface sound produced in response to player action. However, the sound is not an actual sound of an event in the gameworld, since it would make little sense if the peon actually were talking to the player.

Gameworld vs. Gamespace

So far we have seen that game system information and game user interface features such as sound may be more or less integrated into the gameworld. However, they will also have a specific relationship to the *gamespace* of a specific game. Looking at this relationship may provide us with clear insights into how gameworlds work compared to diegeses. Gamespace should be understood as the conceptual space in which the game is played (Juul, 2005, p. 167), independent of any possible fictional universe used as a context for it. It is thus the *arena* on which gameplay takes place, and includes all elements relevant for playing the game. According to the *magic circle* theory (Huizinga, 1955, p. 10; Salen & Zimmermann, 2004, pp. 94-95) all games are seen as a subset of the real world, delimited by a conceptual boundary that defines what should be understood as part of the game and not. The magic circle is what separates the game from the rest of the world, and defines thus the gamespace (Juul, 2005, pp. 164-167). One may go as far as claim-

ing that all elements affecting gameplay should be counted within in the gamespace, regardless of whether these are part of the original system or design. From this point of view, gamespace seems to be equivalent to Grimshaw's and Berndt's understanding of diegesis, since it includes external system features relevant for gameplay, such as voiceovers announcing new players entering the game. Gamespace is therefore also what Droumeva (2011) seems to have in mind when focusing on the importance of live chat and talk that happens during group play. The gamespace is thus separated from the gameworld by including all features that have direct relevance to progress in the gameworld, be it score music signaling approaching enemies or add-on software in *World of Warcraft*, while the gameworld is the contained universe or environment designed for play in which actions and events take place. In this sense, a static overlay interface of a computer game is part of the gamespace, even though it may not be part of the gameworld, while a dynamic integrated interface would be part of the gameworld.

For clarification, take the screenshot from *Diablo II* in Figure 1 as an illustration. The right half of the screen consisting of inventory, the bottom action bar including health and mana measurements, and the upper left icon of the avatar's minion are all parts of the overlaid interface. These should not be interpreted as part of the gameworld, which is represented by the virtual environment on the left. The interface features are, however, directly relevant for player progress in the gameworld, and they are also attributes governed by the game system. They must therefore be seen as part of the gamespace; that is, the space of action relevant for the game progression included within the magic circle of the game. Now consider the left side of the screenshot, a screen segment of the gameworld. One interesting feature in this part of the image is the small illuminated icon above the avatar's head which represents a boost to the avatar's stamina. In terms of transdiegeticity, I would have explained this feature as internal transdiegetic because, in
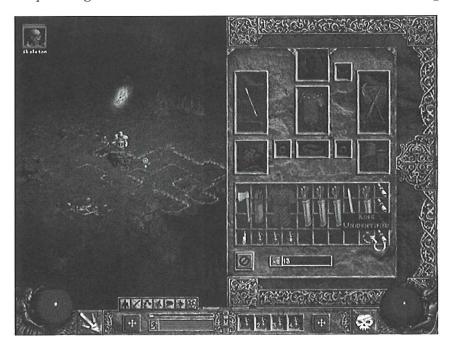
Figure 1. Gamespace vs. gameworld. Diablo 2. ©2000 Blizzard Entertainment, Inc. All rights reserved

a traditional sense, it is a feature that seems alien to the diegesis while at the same time it provides information about the gameworld. However, viewing gameworlds as different constructs compared to traditional fictional worlds, the icon is clearly part of the gameworld, since it is not part of the overlay interface, but a feature picked up as the avatar visited a stamina well and which follows the avatar everywhere he walks. Since gameworlds works on other premises than traditional diegeses, players would have no problem accepting that this is part of the gameworld even though the avatar is not aware of it.

There is an important direct link between the gamespace and the gameworld which is particularly accentuated by the use of sound. When the player decides to discard an item in the screenshot above, he will use his mouse to drag and drop the item from the inventory on the right to the virtual environment on the left or, in other words, he will move it from the gamespace to the gameworld. The moment he selects the item in the

inventory, there will be a short, nondescript click which does not seem to represent any actual sound in the gameworld. However, once he discards it in the gameworld, there is a responsive sound resembling that item being dropped to the ground. If it is a potion, there is a bubbling sound and, if it is a weapon, there is the sound of metal hitting the ground. By being adjusted to the atmosphere of the different spaces, the sound clearly emphasizes which frame it belongs to; there is no doubt, though, that it does move from one to the other.

However, how this movement from frame to frame is achieved may vary between games and genres. A first-person shooter like *Crysis* (Crytek, 2007) that integrates the interface as a HUD[3] that is part of the avatar's suit situates the relationship between gameworld and gamespace somewhat differently from third person perspective avatar-based games. One of the empirical player respondents elaborates:

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I'm absolutely positive to the idea [that the avatar sees the HUD]. It's presented so that the suit he's wearing [...] in a way provides all the information that you need, through the perspective. And, well, it's one solution, they probably try to make it an integrated part of this world. (Eric, (26). Individual interview, Nov 28, 2008)

Here, even the HUD and overlaid features must be interpreted as part of the gameworld and thus the gameworld and the gamespace overlap each other more or less completely. The reason for this is that the game user interface designers have decided to make the interface part of the avatar's advanced military suit so that all audio-visual information is provided to the avatar in the same manner as it is provided to the player.

While all features are part of the gamespace as long as they are not connected to external menus in which one changes the game settings or starts a new game, they may or may not be connected to the gameworld as well[4]. If they are, they are typically positioned in the gameworld in the same way as what I earlier called internal transdiegetic features. While not appearing to be native to the gameworld, they are still positioned inside it graphically. They may be placed above the heads of non-playing characters in a way that allows the player to move around it: It will move with the environment, and not with the overlay interface that is tied to the edges of the screen. An example of a corresponding auditory feature, is the "Hi, you're a tall one!" response from a non-playing character (NPC) in *World of Warcraft*. Features I earlier called external transdiegetic, however, are not part of the gameworld, only of the gamespace. They are not integrated into the gameworld but provide information relevant for gameplay. An auditory example of this is music signaling the presence of enemies in *The Elder Scrolls III: Morrowind* and *Dragon Age: Origins*.

In this section I have argued that sounds have a particular role in connecting the gamespace and the gameworld, making the boundary between the two more seamless by using interfaces that are integrated into the gameworld in different ways. Since sound is neither tangible nor visible and has a temporary quality, it does not disrupt the sense of a unified space in the same way as alien graphical features would. It therefore seems to be easier to accept the growl of an attacking animal than it is to accept a question mark floating around in thin air. This therefore provides greater potential for designers for manipulating auditory information compared to visual information when creating user interfaces for games. The fact that gameworlds work on other premises compared to traditional fictional worlds is what makes the player accept stylistic and abstract sounds that integrate the game system into the gameworld, but this ability is also part of the reason why gameworlds are accepted as a different constructs compared to the traditional fictional worlds. This discussion also puts emphasis on the argument that talking about diegesis, and thus diegetic and non-diegetic sound, has crucial shortcomings that are avoided if we instead evaluate gamespaces on their own terms by emphasizing how gameworlds differ from other fictional worlds.

SPATIAL INTEGRATION OF GAME SOUND

If we want to find an alternative model that describes the relative integration of sounds in gameworlds, we need to get away from the bi-ased meaning of diegesis and instead focus on the specificities of game sound. In evaluating the usefulness of the concepts diegetic and non-diegetic in relation to game sound, I have stressed that these do not grasp how sounds are integrated into the gameworld and that they do not empha-size how sounds work as an interface providing action-relevant information to the player. In this section, I will present a game-specific approach to describing game sound that avoids the use of the diegetic/non-diegetic diad. Due to the scope of

this chapter, the model focuses on spatial integration and the difference between gameworlds and storyworlds, but it also reflects awareness of the functional aspects of game sound by looking at it as an interface, and how these aspects transcend the border of the gameworld in a meaningful way.

This model puts emphasis on how well a sound is integrated into the gameworld. It builds on and supports existing theories on how we may understand gameworlds, game sound and how they work together. Grimshaw's radical interpretation of diegesis is conserved in emphasizing the distinction between gameworld and gamespace, and we also gain new insight into the functional and integrational aspects of so-called transdiegetic sounds. Also, Galloway's focus on games as activities is preserved as there is a heavy focus on how sounds affect gameplay in addition to the fact that gameworlds are games intended for play. Last but not least, the model avoids all confusion connected to the usage of terminology connected to the diegesis. This approach will be described in detail below. In pointing out that game sounds should be seen as an interface, it places emphasis on the usability aspects of sound in the sense that it provides information to the player such as warnings and responses as well as information relevant to game control, identification, and orientation. See Table 1.

This interpretation of sound's integration into the gameworld is based in Saunders & Novak's separation of static and dynamic interfaces, but I believe it is more fruitful and more correct to see this separation not as a binary divide but as a continuum that integrates user interface elements into the gameworld to a lesser or greater degree. Moreover, since sound is part of a game's user interface, it is also possible to locate different sounds on the same continuum. In the table above, I have identified five points on this continuum where sound signals tend to be located in modern computer games. All categories have a certain degree of integration into the gameworld, with the exception of the first group which is the only one that is not part of the gameworld. I call this group *metaphorical interface sounds* since they are not "naturally" produced by the game universe but have a more external relationship to the gameworld, even though they also have a metaphorical similarity (Keller and Stevens, 2004) to the atmosphere and the events in it. The enemy music found in *Dragon Age: Origins* and *The Elder Scrolls III: Morrowind* are typical examples of these kinds of sounds, which are usually system-generated and may provide orientating and identifying information as well as working proactively as a warning to the player.

The remaining four categories are all integrated into the gameworld in different ways and to different degrees. *Overlay interface sounds* have the same relationship to the game as Saunders & Novak's static user interface when it is added as an overlay. These sounds are directly connected to the overlay menus, maps and action bars, and are typically generated by the player in response to his commands. These are found in most game genres but are in particular common to interface-heavy genres like real-time strategy games. The example above is from *Command & Conquer 3: Tiberium Wars* (EA LA, 2007), where the player

Table 1. Game sound and world integration

Metaphorical interface	*Dragon Age: Origins:* Enemy music
Overlay interface	*C&C3:* Mouseclick when selecting actions
Integrated interface	*Diablo 2*: Sound following boost
Emphasized interface	*WoW*: "Hi, you're a tall one!"
Iconic interface	*Crysis:* Avatar moans when injured

typically hears the generic sound of a mouseclick every time he selects an action from any of the menus. *Integrated interface sounds* are typically related to user interface elements that have been placed into the gameworld, such as exclamation marks and the icons above the heads of characters. The sound played as the avatar gets a boost to stamina in *Diablo 2* is a typical example of this and it is a system-generated sound that works as a notifier that also identifies the boost in question. *Emphasized interface sounds* have a somewhat different relationship to the gameworld as they often appear to be generated by friendly NPCs in the gameworld. An example is the lines spoken by NPCs in *World of Warcraft* in response to player targeting: When the goblin merchant says "Hi, you're a tall one!" This is a sound that appears to be diegetic in the traditional sense of the term since it is something a character in the gameworld actually says, but it is in fact a system-generated sound that has been stylized and fitted into the gameworld. *Iconic interface sounds*, however, are completely integrated into the gameworld and correspond to Saunders and Novak's dynamic user interface features. In terms of film theory, these sounds would be labeled diegetic as they seem to belong naturally to the universe in which they are in. They can have any kind of generator and may provide any kind of usability information. An example of an iconic interface sound is heard when the avatar moans because he is injured in *Crysis*.

While this model is limited to solely taking into account spatial integration of game sound, it is fully compatible with my earlier models describing the usability value of a sound (Jørgensen, 2007b) and what generates a sound (Jørgensen, 2008). When combining these functions, we may study game sound along several dimensions that grasp usability on a more general level by identifying whether a sound provides responsive or urgent information and whether it is related to control functions, orientation or identification. Such a combination would be able to dive into the gameworld describing what event generates

a sound and identifying what that event means for the player's state. Last but not least, it would take into account how the sound is integrated into the gameworld. Combined, the models will form a comprehensive and detailed analytical tool that describes all gameplay related sounds in computer games, without creating the confusing association to traditional diegeses.

CONCLUSION

When sounds work functionally in the sense of providing gameplay-relevant information to the player, it must be seen as part of the user interface of a game. In this respect, we need to acknowledge its status as such and use an approach that allows us to describe it in terms of an interface. However, the traditional distinction between diegetic and non-diegetic is not based on participatory use and does not allow us to describe game sound in this way. This article presents a game-oriented alternative to diegetic and non-diegetic that takes into account spatial integration of sounds from a gameplay perspective. The model is also compatible with earlier models characterizing game sound (Jørgensen, 2007a, 2008, 2009) and together they form a framework that allows us to describe the interface aspects of computer game sounds while also paying equal attention to its relationship to the gameworld as an environment that reminds of those of fiction but instead is built on game rules.

While this chapter argues for substitution of the terms diegesis, diegetic and non-diegetic when discussing sound in games, it should be stressed that these terms may be fruitful in some respects. They may be used when a scholar wants to compare computer games and game sound with other media and they may also be used the way this chapter does; to show why they are problematic. From these perspectives, Galloway's, Ekman's, Grimshaw's and Jørgensen's earlier work on the subject are important contributions that are especially fruitful for those seeking to

understand how game sound and gameworlds differ from other media. It is, however, important to emphasize the fact that spatiality in computer games operates on very different premises than in film, for instance, and that we talk about a different relationship between sound and environment compared to the traditional separation between diegetic and non-diegetic. A crucial difference is that gameworlds are different constructs from traditional fictional worlds and this must be taken into consideration when discussing the origin of sounds and other features.

It is important to note that the model presented here is not limited to the study of game sound but that it may be used to analyze all interface-related features of a computer game. However, sound is particularly interesting because of its seamless integration and its ability to remain non-intrusive even when it tends to break with the conventions of the gameworld. It should also be mentioned that the framework is supposed to work as a tool to help us better understand how game sound and other game features operate, and as such, it will always be subject to modification.

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KEY TERMS AND DEFINITIONS

Diegesis: Originally referring to pure narrative, or situations in which the author is the communicating agent of a narrative, diegesis was revived in the 1950s to describe the "recounted story" of a film. It is today the accepted term in film theory to refer to the fictional world of the story.

Diegetic: That which is part of the depicted fictional world. Diegetic sounds are thus sounds that have a source in the fictional world.

Game System: The formal structure of the game consisting of a set of features that affect each other to form a pattern. Includes the rules of a game and the mechanisms that decide how the rules interact.

Gamespace: The conceptual space or arena in which a game is played, independent of any possible fictional universe in which it may be set. Gamespace is defined by the magic circle, and includes potentially all elements relevant for playing, regardless of whether they are part of the original system or not.

Gameworld: A unified and self-contained universe that is functionally and environmentally designed for the purpose of playing a specific game. Gameworlds are oriented towards a specific gameplay experience and do not need to be explained as a credible part of a hypothetical world.

Metaphorical Interface Sounds: Sounds that provide usability information to the player while being placed external to the gameworld. An example is adaptive music which informs the player that an enemy is approaching.

Non-Diegetic: That which is external to the fictional world. Non-diegetic sounds are thus sounds represented as coming from a source outside the fictional world.

Overlay Interface Sounds: Sounds that are associated with the overlay interface placed as a filter on top of the gameworld. An example is the sound of mouseclicks whenever the player makes a selection from the action bar.

Transdiegetic: Transdiegetic features are auditory and visual elements of a computer game which transcend the traditional division between diegetic and non-diegetic by way of merging system information with the gameworld. Transdiegetic features thus create a frame of communication that has usability value at the same time as they are integrated into the represented universe of the game.

Integrated Interface Sounds: Sounds that are connected to user interface elements that have been placed inside the gameworld for usability purposes. An example is system-generated sounds that follow the player's collecting of coins, boosts or other prizes.

Emphasized Interface Sounds: Sounds that have been stylized and fitted into the gameworld while also remaining clear system-generated features. Examples are the auditory responses from units being selected in strategy games.

Iconic Interface Sounds: System-generated sounds that are completely integrated into the gameworld as if they were natural to that universe. An example is the sound of weapon use in a game.

ENDNOTES

1 All quotes are originally in Norwegian, and have been translated by the author.

2 MMO is short for Massively Multiplayer Online games. These are games in which thousands of players play together on online servers.

3 Originally a military technology, HUD is short for heads-up display which is "an electronic display of instrument data projected at eye level so that a driver or pilot sees it without looking away from the road or course" (Random House Dictionary, 2009).

4 As the formal structure of the game, the game system seems to lie somewhere in between the gamespace and the gameworld. While talk between players during group play in the same physical space would be part of the gamespace, this kind of communication is not an actual part of the formal game system. However, so-called external transdiegetic features such as music signalling incoming enemies, are clearly part of the game system even though they are not part of the gameworld.