Oneiric Film Sound and Human Brain

Dr. Mladen Milicevic
Loyola Marymount University, Los Angeles

Abstract

The focus of this paper is to connect an area of film studies (related to film sound) and recent findings in neuroscience. Since 1929 and Alfred Hitchcock's "Blackmail" subjective film sound has been introduced and after that significantly "tweaked" and redefined. However, it is quite interesting to observe that even though the filmmakers "intuitively" arrived at the sort of "formula" for creating the oneiric sound experience, there is actually neuroscientific evidence that supports this "formula".

Keywords: Film sound, meta-deigetic, oneiric, altered states of consciousness (ASC), time distortion

Meta-diegetic Film Sound

To my knowledge, the first one who proposed the meta-diegetic category for, so-called, internal sounds was Claudia Gorbman[27] in her film sound taxonomy. According to Gorbman, sound source on the narrative level may be diegetic[28], extra-diegetic[29], and meta-diegetic. Meta-diegetic sound was explained as sound imagined, or perhaps, hallucinated by a character. Before Gorbman, there have been numerous theories, which agree on the basic principle that film sound may be perceived as either diegetic, or non-diegetic--as defined by its source of origin. Therefore, the sound which is normatively perceived and understood by the film characters may be called diegetic; e.g. all the dialogue, sound effects, and music that originate in diegetic space; and non-diegetic sound which would then be the opposite from diegetic; e.g. voice-over narration, and musical score--both of whose existence film characters are unaware.

[27] Claudia Gorbman, Teaching the Soundtrack Quarterly Review of Film Studies (November 1976): 446-452.

[28] The total world of the story action is called *diegesis* □□□□□□□□□□ in the ancient Greek.

[29] Later writing about film music, she changed it into non-diegetic. Claudia Gorbman, Unheard Melodies: Narrative Film Music, (Bloomington, IN: Indiana University Press, 1987), 3.

Bordwell and Thompson[30] unnecessarily complicated this matter by looking at the diegetic and non-diegetic sound from its temporal relationship to the image. According to them, film sound can appear earlier, simultaneously, or later than the image. Classifying even further, they recognized displaced diegetic sound, which takes place in the past or the future, and simple diegetic sound, which is taking place in the present. In addition, they propose, each of these categories may be external, i.e. spoken aloud by the character(s) and internal, i.e. imagined in the character's head (thoughts).

Theorizing even further Michel Chion proposed two more new categories for internal sound. He writes:

> *Internal sound* is sound which, although situated in the present action, corresponds to physical and mental interior of a character. These include physiological sounds of breathing, moans or heartbeats, all of which could be named *objective-internal* sounds. Also in this category of internal sounds are mental voices, memories, and so on, which I call *subjective-internal* sounds.[31]

All these film theories that attempt to classify film sound into absolute and complicated categories talk about sound which parallels or counterpoints the images, sound that is synchronous or asynchronous in relation to the images, sound that is either realistic or unrealistic, or sound that is literal or nonliteral. In order to accomplish this impossible pursuit and get to the bottom of the meaning of film sound, all these theories needed several sub-categories, which in return required their own sub-sub-categories, and so on ad infinitum. The reason why these film sound theories have difficulties lies in their attempt to get absolutely finite results beyond contingency. Unfortunately, in the end they become more about making classifications than they do about understanding cinema.

Oneiric Film Sound

Even though Gorbman was critical of over-classifying film sound by the others, she likewise proposed just another set of categories. Gorbman was of considerable significance, since she established the term meta-diegetic and opened up the whole new analytical world of subjective and non-normative film sound. Here, I am going to focus on meta-diegetic sound, but before I do that, let me introduce another term--*oneiric.* In ancient Greek oneiros □□□□□□□□□□means dream and the first one who adopted this term was Vlada Petric using *oneiric cinema* to describe films that deal with

[30] David Bordwell and Kristin Thompson, Film Art: An Introduction 2nd. ed. (New York: Addison and Wesley, 1979), 246-249.

[31] Michel Chion, Audio-Vision: Sound on Screen (New York: Columbia University Press, 1994),76.

various kinds of altered states of consciousness. Petric's interest in oneiric film perception exists mostly on visual level, he states:

> On a purely cinematic level, oneiric implies film imagery that stimulates a paradoxical experience: while the event on the screen is perceived on a rational level as absurd and impossible, it is at the same time accepted as "reality," with full psycho-emotional involvement on the part of the viewer in the diegetic world presented on screen.[32]

There is a significant difference in achieving the oneiric at visual and aural planes of experience, but if there is a common element it is represented by a departure from normative perception of reality. Freud writes in his preface to the first edition of *Interpretation of Dreams* that "the dream represents the first class of abnormal psychical phenomena";[33] he depicts it as a *deviation* from the usual condition of mind.

I am going to use meta-diegetic to signify character's subjective perception of the reality, and oneiric to signify character's total or partial departure from reality. Both of these terms are referring to the deviation from normative film sound into a subjective sound of altered states of consciousness. Nonetheless, the notion of meta-diegetic perception could be traced back into the silent days of Italian Futurist cinema. Written in 1916 *Manifesto of Futurist Cinema*[34] among other important points stated that their films would be a sort of *polyexpressive symphonies* and *dramatized states of mind*. Siegfried Kracauer has written about *special modes of reality*[35] that could be cinematically represented. Kracauer pointed out, that "films may expose physical reality as it appears to individuals in extreme states of mind generated by" various kinds of "mental disturbances or any other external or internal causes." The first actual creative use of meta-diegetic film sound as a dramatized state of mind dates back to 1929 and the first British talkie *Blackmail* by Alfred Hitchcock. In the well known *knife sequence* Hitchcock is using sound to penetrate the subjective mental state of Alice (Anny Ondra) whose aural perception of reality suppresses everything but the word *knife*, which rings in her mind and becomes the solely focus of

[32] Vlada Petric, Oneiric Cinema: The Isomorphism of Film and Dreams, Handout for the course *Oneiric Cinema*, (Cambridge, Massachusetts: Harvard University, Spring 1995), 1.
[33] Sigmund Freud, The Interpretation of Dreams, (New York: Avon Books, 1965), xxiii.
[34] F. T. Marinetti, Bruno Corra, Emilio Settimelli, Arnaldo Ginna, Giacomo Balla, and Remo Chiti, (Milano: L'Italia Futurista, 1916); In the US could be found in, Umbro Apollonio ed., Futurist Manifestos, (New York: The Viking Press, 1973), 218.
[35] Siegfried Kracauer, Theory of Film: The Redemption of Physical Reality, (New York: Oxford University Press, 1960), 58.

her attention, until her father interrupts: “Alice, cut a bit of bread, will you.” [36]

The most common use of subjective film sound is certainly in a form of the internal monologue. Bela Balasz wrote in 1952 that film sound would be most expressive when it was asynchronous to the picture.[37] Such sound would be conceived independent of the image but, at the same time, give it a parallel meaning--a sort of running commentary to the scenes. Balasz wrote:

> In one of the Soviet war films there was a young soldier whose nerves give way when he first comes under fire. He deserts his comrades and hides in a shell-hole. A close-up shows his face and by his closed mouth we can see that he is silent. Nevertheless we hear him talking. The monologue we hear is in his mind and we listen tensely to what he is silently saying to himself. If he had really spoken aloud and said the same words in a voiced monologue, this scene would have been unbearable. For nowadays even on the stage we find an 'unnatural' monologue difficult to accept.

Balasz also stressed, that "asynchronous sound has no need to be natural. Its effect is symbolic and it is linked with the visuals it accompanies through its significance, in the sphere of mind, not of reality." Balasz was convinced that "this is the richest and deepest possibility of artistic expression of sound film," because the action can move on two parallel levels at the same time, "in the sphere of sound and in the sphere of visual image."[38] Mary Ann Doane stressed the difference between the voice-over

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[36] Many authors have written about this scene:

After having killed her assailant with a knife, the young heroine of Alfred Hitchcock’s "Blackmail" finally returns to her parents' shop and there overhears the chatter of a gossipy woman customer. The camera is just focusing on the listening girl, as the woman suddenly drops the word "knife."

Siegfried Kracauer, Theory of Film: The Redemption of Physical Reality, (New York: Oxford University Press, 1960), 122-123.

Like images, sound can be used subjectively to express the impressions or state of mind of a character in the film. There is the famous scene from Hitchcock's Blackmail in which the words 'Knife, Knife, Knife', are repeated in a frightened girl's mind.

Ralph Stephenson and Jean R. Debrix, The Cinema as Art, (Baltimore, Maryland: Penguin Books, 1965), 198.

Most of the experiments are in the expressionistic mode, the two most famous examples being the subjective distortion of the word "knife" in "Blackmail" and the interior monologue in Murder. Both experiments are attempts to convey a character's thoughts and feelings. Yet at the same time both techniques draw attention to themselves as tricks and leave the audience emotionally outside the characters.

Elisabeth Weis and John Belton, Film Sound: Theory and Practice, (New York: Columbia University Press, 1985), 302.

[37] Bela Balasz, Theory of the Film: Character and Growth of a New Art, (New York: Dover Publications Inc., 1970), 218-219.

[38] ibid. 219.

and the interior monologue. She emphasized that interior monologue displays what is inaccessible to the image, what exceeds the visible: the "inner life" of the character.[39]

An aural *oneiric-feeling* in narrative cinema, as stated earlier, is usually achieved by some kind of departure from normative film sound. Most of the film sound is normatively diegetic and non-diegetic, thus deviation from it may lead into oneiric or meta-diegetic. There are two terms from theories of sleep and dreams which may come in handy for our understanding of oneiric--*hypnagogic* and *hypnapompic*. Hypnagogic representing the state of falling asleep or drifting away from the reality world, and hypnapompic representing the state of waking up or coming back to the reality world.

Oneiric Film Sound Examples

Meta-diegetic use of sound as internal monologue has become a fairly common practice in contemporary filmmaking. I would like you to pay attention to a more complex but very effective use of film sound creating an oneiric mood for meta-diegetic soundscape. Now, I am going to present several examples of aural oneiricism as used in different films. Since all these examples share the common element of move into non-normative film sound lets examine what are the ways of achieving it. One of the simplest and most vivid jumps into an oneiric mood is by completely dropping off the normative sound effects and letting the music alone to take over.

One of the most vivid and interesting examples of an oneiric soundscape comes from *Witness* (USA 1985) directed by Peter Weir. In the sequence at the police station where detective John Book (Harrison Ford) is showing the mug shots of the possible killers to the Amish boy, Samuel (Lukas Haas), sound effects to create the atmosphere of a police office are deliberately mixed in, much louder than normally. This is done to highlight the subjective reaction of the Amish boy to a alien environment of a police office. Then, wandering around Samuel sees in a display cabinet a paper clip and the photograph of McFee (Danny Glover), a top narcotics officer, honoring him for his achievements in a youth project. At that moment, the boy realizes that McFee is actually the killer, meanwhile the sound effects have been dropped out (leaving the reality) and the musical score (Maurice Jarre) alone creates an oneiric mood. Detective John Book comes in a subtle slow motion towards the boy who is pointing his index finger to McFee's photo identifying him as the killer. Book stunningly realizes the implications of boy's discovery and the fact that the police department itself is involved in

[39] Philip Rosen, ed. Narrative, Apparatus, Ideology: A Film Theory Reader , (New York: Columbia University Press, 1986), 341.

the killing. The "wake up call" from this oneiric state comes as a door buzzer sound effect leading into the upcoming scene.

This is not entirely the case with the sequence from *Empire of the Sun* (USA 1987) directed by Steven Spilberg where US airplanes come to bomb and liberate the Japanese prisoners of war camp. The main character a boy, Jim Graham (Christian Bale), is obsessed with airplanes, and in this sequence his obsession is presented in an altered state of consciousness. In the midst of the battle Jim is speechless while looking in slow motion at an airplane whose pilot is waving to him from the open cockpit. Sound effects slowly disappear and the musical score (John Williams) completely takes over creating a meta-diegetic effect. Gradually returning from this mesmerizing mood Jim yells "Go!!! B51 the Cadillac of the sky!", and then a big explosion brings the audience back to the fierceness of the battle by reestablishing all the previously dropped war sound effects.

Transitions to flashback sequences are often accompanied by an oneiric sound treatment like in *The Silence of the Lambs* (USA 1991) directed by Jonathan Demme. Young detective, Clarice Starling (Jodie Foster), while attending the funeral service for the police officer killed in the line of duty is having a flashback. As Clarice walks through the door the sound effects and diegetic music give a way to a non-diegetic musical score (Howard Shore) and set up an oneiric mood. A man playing a "soundless" organ can be seen as Clarice completely drifts away from reality and walks towards the coffin. She is seen in subtle slow motion going into a flashback of her father's funeral, who was, also, a police officer killed in the line of duty. Clarice's altered state of consciousness is interrupted by the voice of Jack Crawford (Scott Glenn) who abruptly brakes off the mood saying: "Starling, we are back here!"

Another marvelous example of flashback and oneiric mood comes in a sequence from *Chariots of Fire* (UK 1981) directed by Hugh Hudson, in which British athlete, Harold Abrahams (Ben Cross), is preparing for a race at 1924 Paris Olympics. The high level of concentration and an undoubtedly altered state of consciousness before the race is presented visually through the use of slow motion. On the aural level the same is achieved through the musical score (Vangelis Papathanassiou) by omitting the cheering crowd ambient sounds and selectively focusing onto footsteps and digging-in sounds of the racers as they prepare to take their marks. Then, just a few seconds before the race starts, the music fades out and we hear Abrahams's heartbeat sound alone. The firing of the starter's gun brings us back to the reality of the cheering crowd sounds and regular motion. Abrahams wins the race and stunned by that fact goes through a flashback of the entire event depicted in slow motion. We hear the start gun fired again but this time its sound quality is altered and reverberated to portray the subjective perception

of Abrahams. Everything is accompanied by the musical score; no cheering crowd sounds, and very few selected sound effects. Still in slow motion, we visually cut back and forth from Abrahams's flashback to reality but his altered state of consciousness is uninterrupted, even as he (in reality shots) receives handshakes of congratulations and poses for photographs. Abrahams's flashback ends as he breaks the ribbon crossing the finish line. The music withdraws abruptly and the full blast of the crowd cheering returns us to reality.

It is interesting to see how sound is oneirically treated in a flashback sequence from *Patriot Games* (USA 1992) directed by Phillip Noyce. The CIA detective Jack Rayn (Harrison Ford) is struggling to assemble the puzzle of an IRA terrorist group which is trying to kill him and his family. While washing his face in the bathroom, Jack is going through the series of slow motion flashbacks, some of which are triggered from reality by the appearance of a woman who accidentally interrupts his oneiric state. Constantly going back and froth from the flashback to reality, a meta-diegetic mood is achieved through the use of the musical score (James Horner) and acoustically altered sound effects for the flashback parts. What is particularly interesting here is that, in spite of very vivid visual oneiricism, on the aural level we never completely leave reality--ambient sounds are always present. This shallow acoustic representation of oneiric is deliberately used to show Ryan's striving to connect the puzzle pieces together in his head. The case of stunning revelation in *The Witness* required a very deep oneiric mood, while for the scattered flashback in *Patriot Games* demanded the use of shallow oneiricism. Sometimes, like in *The Fugitive*, USA (1993) by Andrew Davis, flashback scenes are nothing but glimpses in which to accomplish any sense of aural oneiricism, distorted visual images are being accompanied by acoustically transformed and heavily manipulated sound effects.

In *Scarface* (USA 1983) directed by Brian De Palma, oneiric mood is achieved by using the juxtaposition of diegetic disco club music with non-diegetic musical score (Giorgio Moroder). In the sequence when Tony Montana (Al Pacino) and his buddy Manny Ray (Steven Bauer) walk in a disco, they see Tony's sister Gina (Mary Elizabeth Mastrantonio) dancing at the dance floor with some guy. This upsets Tony a lot and while camera closes up on his eyes, the non-diegetic musical score is being introduced to parallel Tony's altered state of consciousness-two different kind of music are heard simultaneously creating a rather abrasive combination. A few moments later, Tony's business conversation is interrupted as he pays attention to Gina again. Now, presented in slow motion, she appears to be in a cozy relationship with her dancing partner as they walk together towards the bathroom--this makes Tony absolutely furious. Here again, camera

subjectively closes on Tony's face, and this time the non-diegetic score completely overwhelms the diegetic disco music. The loudness of the non-diegetic musical score parallels the degree of Tony's anger. As Tony suddenly gets up and runs to the bathroom to attack Gina's partner, the non-diegetic music is abruptly dropped and we are back in the reality of disco dancing.

Finally, let me finish with the opening sequence from *Apocalypse Now* by Francis Ford Coppola. It starts oneirically from the very beginning, with the picture being presented in slow motion, accompanied by the song *The End* by *The Doors* . We see the explosions but don't hear them, the helicopters are flying by, but we hear acoustically altered helicopter sounds that don't match the visuals in perspective or the rhythm. Then, we see Captain Willard who is laying on his bed and we discover the opening images are visuals from a nightmare he has been having. While looking at the ceiling fan he hears meta-diegetically transformed helicopter sounds. This mood is invaded by the sound of a real helicopter, which comes through Willard's window, and he is prompted to wake up from this oneiric state while the music slowly fades out into a distant reverberation creating a hypnapompic transition to reality. He gets up and looks through the window talking to himself in an internal monologue: "Saigon, shit..." This monologue continues and as he talks about jungle, even though we see him in a hotel room, jungle ambiance sounds are introduced, subjectively portraying Willard's drunken aural imagination.

Looking at the examples I analyzed, the "oneiric sound formula" seems to follow the pattern of 1. Gradually dropping sound effects of "reality" 2. Gradually introducing non-diegetic musical score 3. Picture is presented in slow motion 4. Oneiric mood is created which, represents the film character's altered state of consciousness 5. The oneiric state is abruptly cut off and return to "reality" (the normative film sound) is established.

The Neuroscientific Explanation

Many people have experienced high adrenaline situations, such as avoiding a car accident, in which time seems to slow down. Here is how David Eagleman describes it:

> Many people report that time appears to run in slow motion when they find themselves in an impending car accident -- for example, sliding toward a bad situation. Crudely speaking, are neural 'snapshots' clicking faster during a high-adrenaline situation? To bring this into the realm of scientific study, we have measured time perception during free-fall by strapping palm-top computers to their wrists and having them perform psychophysical experiments as they fall. By measuring their speed of information intake, we have

> concluded that participants do not obtain increased temporal resolution during the fall -- instead, because memories are laid down more richly during a frightening situation, the event seems to have taken longer in retrospect. Details can be found in Stetson, Fiesta, Eagleman (2007). Does time really slow down during a frightening event? *PLoS One*.[40]

Speaking of the human visual system functions, it is apparent that the brain has to take time to synthesize all the information it takes. However, that information comes into the brain at different speeds and times. For example the brightest visual imagery comes in and gets processed faster than the dimmer information. So, of you are looking at the picture of human face that is lit from one side only, thus the other side that is dim takes much longer for the brain to process but in the end we perceive the entire object, the human face, all at once. The brain had to wait for about 100 milliseconds for all the information to come in, to be processed and synthesized into a final image representation. This is a normal way that human brain operates under the ordinary (normative) circumstances. The rate of expected incoming information has been evolutionarily optimized to be within a certain range to make the best use of the peculiarities of the apparatus that supplies the information to the brain: the eyes and parts of the thalamus. These brain neural structures that provide information to the visual cortex have their own evolutionary histories and oddities. When the rate of incoming "data" increases, as in the case of "adrenaline rush" situations, or other situations of an altered state of consciousness, the brain gets overloaded and it takes much longer time "to put everything together." This is why humans perceive a subjective time distortion, and everything seems to slow down.

> In the early days of television broadcasting, engineers worried about the problem of keeping audio and video signals synchronized. Then they accidentally discovered that they had around a hundred milliseconds of slop: As long as the signals arrived within this window, viewers' brains would automatically resynchronize the signals; outside that tenth-of-a-second window, it suddenly looked like a badly dubbed movie.[41]

In the neuroscientific literature, this effect has been termed a subjective "expansion of time," however, the slow down effect is just a feeling of time passing by, the slow down of images and sounds does not actually happen. Under these situations, humans do not perceive slowed down sound for example. Things do not sound pitched-down as if the sound has slowed

[40] http://www.eagleman.com/research/23-time/110-time-and-the-brain-or-what-s-happening-in-the-eagleman-lab (accessed January 2016)
[41] http://www.eagleman.com/blog/brain-time (accessed January 2016)

down. Similarly, in the films all slow motion sequences either have no sound (as explained earlier) or have very selective "sound pallet" that is rarely pitched-down.

Conclusion

Way before any neuroscientific explanation was even possible, the filmmakers have portrayed in numerous films the human subjective experiences that deal with time distortion. Altered states of consciousness have been cinematically depicted in many different forms and shapes, much of them creating for a viewer an oneiric experience. It is particularly gratifying to see that what filmmakers "intuitively" produced as a part of their creative filmic expressions, is now actually backed up by the neuroscientific research.

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