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Style parameters

in

film sound.

(The final product is a CD-ROM. Anyone interested
can contact the author on E-mail: odabas @ swipnet.se)

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Introduction .

- Sound in film fulfils a **variety of functions**. Speech is not only dialogue. There are often visible or invisible narrators. Spoken words can convey meaning or emotion and are sometimes used as ambient sound. Music has a unique quality to create feelings and emotions which can support or contrast what we see on screen. Music can send signals of symbolic character. It can illustrate movement. Ambient sound can give atmosphere to filmic space. It can give life and substance not only to what we see on screen but also to off-screen. Sound effects are important for the narration and for creating feelings of tension and horror. Sound can define a character and indicate a historical period or a geographical locale but it can also draw attention to a detail.
- Sound has **great impact** on the audience. All the peak situations in films, scenes with great sentiment, tension or horror utilise effect sounds of various kinds to convey those emotions. The sound score is the emotional score.
- The **way sound is used** in film **varies** a great deal. Substantial changes have taken place over time. The sound score reveals in which decade the film was made. There is a difference between films from the same age that can be related to cultural environment, genre, director or studio. Their diversity and divergence can be great.

The variety of functions, the great impact and the differences in use make film sound eminently worthwhile studying.

This paper concentrates on film sound as **style**. Style studies focus on the alternative technical choices available to the filmmaker.¹ Style categories are basic measures and at initial stages are also rather crude. Detailed style studies can be richer in nuances, but one must remember that they alone can seldom catch the core of artistry. Style is more a question of craft, skill and ideology, patterns that can be reused in other films.

Focus on style means that sound conventions that are common to all films are of less interest. The sound artistry of an individual film that is unique and not repeatable is also laid aside. The **value of style studies** is that it allows **comparison of films** with each other, to enable those of a similar style to be grouped together, and those of a different style to be separated.

¹ A film maker is never totally free in his decisions. In studio-produced films sound technicians have a great influence and standard conventions are followed. Sound is the result of praxis and a group of people's decision.

A **set of style characteristics** that can clearly **discriminate** between different films, that is **relevant** in the sense that it takes up meaningful alternatives and has a **large coverage** of various sound aspects, can be a very **useful tool**.

This set of characteristics gives:

- a unified way to characterise basic features of film sound, a common language.
- a base for studies of sound conventions.
- a base for further analysis of single films into the individualised artistic area where style analysis is too crude.
- when sufficient amount of films have been analysed, a base for combining style elements that often appear together into broader style categories. With a number of such broader style concepts, where each style may be represented by a particular film, discussions about style are easier to make.

To get comparable results, a **unified approach** is needed. For style characterisation, a **scheme of methods and questions** is necessary. The scheme in this paper is built on the studies made by Michel Chion. In the book *Audiovision: Sound on screen* he has put together the results from previous studies and here developed a very broad and fruitful approach to sound studies.² Chion has used these methods to analyse individual films and has also made a study of Jacques Tati's films but has never embarked on broader style studies.³

The scheme is based on five principles:

- Understanding of auditive perception.
- Knowledge of sound technique in different periods.
- Knowledge of sound conventions/ideologies in different periods.
- Awareness of the emotional impact of music and sound effects.
- Awareness of sound discussions in film literature, to ensure that the scheme covers all major aspects.

To be able to apply the scheme, some knowledge of these areas is needed. The choice of technique and style becomes clearer if you know the preconditions for auditive perception, how sound is received and interpreted, and are aware of the technical limitations in different periods. Sound conventions have evolved very much as an answer to these preconditions. Changes in technical limitations has substantially altered the conventions over time. Ideological positions, linked to some film directors have

² Chion, Michel, *Audiovision: Sound on Screen*, (New York: Columbia University Press 1994).

also been influential. Written debate about sound ideologies is however, especially for later decades, limited.

Technical limitations are not only a hindrance but also a challenge. Alternatives that evolved to compensate for technical limitations can develop into a separate style. In the beginning recorded ambient sounds were lifeless and therefore substituted with musical markings. In the first three decades of the history of sound films, music dominated over ambient sound and sound effects. Now, these sounds have life and timbre and have consequently pushed back the use of music, but the old conventions continue to be used. Still one can see in modern films, people's movement and the sound that it causes, illustrated by music.

The amount of **ambient sound and sound effects** has increased and the area of their use has broadened.⁴ Sometimes there are hidden messages which give an emotional impact without the audience really knowing why. This type of coding is interesting to analyse in the scheme. To be able to do this it is important to go through a number of examples that illustrate how these sounds are created and how they work.

The scheme puts forward **eleven areas for special study**. The areas relate to the three sound components; speech, music, ambient sound and sound effects, their individual characteristics and their interplay. Some questions deal with sound editing in different aspects. Finally there are questions about the use of different audiovisual languages in film. All the questions are basically very simple, but not always so easy to answer in a precise way.

The scheme is used to analyse sound in 20 films chosen to fit into seven themes.

- Boxing match
- Car chase
- Jungle
- Pool room, pool game.
- Train travel
- Horror
- Psychotic killer

The themes are chosen on the ground that they appear to have a characteristic sound, and a change seems easy to describe. They are picked very much at random and there are dozens of alternatives. In

³ Chion, Michel, *The films of Jacques Tati*, (Toronto, New York, Lancaster: Guernica 1997)

⁴ Ambient sound and sound effects are lumped together for the obvious reason that they are difficult to separate. Effect sounds are often exaggerated ambient sounds.

the themes films from different periods are compared. No distinct periodisation is made, but for each there is at least one before and one after the introduction of Dolby.

These 20 film examples are used for a sketch of the history of sound style. The sound development traceable in these films is described. It is a limited database and therefore a sketch which is open to further change and development. There is an open invitation to anyone interested to continue and modify this work.

Style

Every film uses certain techniques in a patterned way. If particular technical choices are used in a **unified, developed** and **significant** way it is called **style**.⁵ To find a style element is to look for differences with regard to the choice of technique. Style is the audiovisual language the film maker uses in communication with the audience.⁶

Film style is usually divided in the following four categories that are interrelated but can be analysed separately:

- Mise-en-scene
- Cinematography
- Editing
- Sound

The number of alternatives that are available for the sound score is great even if you keep within established conventions. If you break these rules, which many do to a greater or lesser degree, the alternatives are even more. Sound is nowadays of major importance in the shaping of a film. **The sound score is created in a conscious way.**⁷

⁵ Bordwell David & Thompson Kristin, *Film Art, An introduction*, (New York: Mc Graw-Hill Inc. 1993) p. 144. My understanding of **unified** is that it is used consequently throughout the whole film, **developed** means that the choice has a substantial meaning for the filmmaker and **significant** means that the viewer can notice the choice.

⁶ For some filmmakers style is not only a language to present a message but a goal in itself. Style has sometimes aesthetic qualities that are maybe as important as the message. The message can be of minor or nil importance. The style then becomes the message. These aesthetic related questions are not discussed further in this paper.

⁷ I am aware of many sound technicians' view that films generally are not made sound conscious enough. Many express the opinion that directors want good sound primarily to enhance the visuals. The technicians want to come into the planning process in order to make the scenes more sound oriented. This can be true but the possibility to make films more sound conscious doesn't rule out that they are sound conscious to a large extent already today.

The scheme does not define the style elements, it is a tool to find them. For instance, the scheme can ask you to question whether a certain sound convention is followed or not. The answer might be that these rules are broken in a certain way and for a specific reason. It is then this specific behaviour that constitutes the style element.

Style analysis aims at grouping films with regards to style. It is of course interesting to ask who or what could have influenced the sound score. Cultural environment, genre, director, composer or sound designer, all have an influence to some degree. Horror- and SF-films have developed new sounds and many have become so established as a routine that they can be included in a genre style. In the case of original music scores the composer usually has a great influence. Many directors have without doubt made the most important imprint, particularly such sound conscious persons as Jacques Tati, Robert Bresson, Orson Welles, Robert Altman and Martin Scorsese.

There exist many sound analyses of single films but very few that compare different films. One comparison of five different directors' styles was made in 1985.⁸ These analyses are made by different authors and have no common structure. They are individually very good but (to my view) it clearly illuminates the need for a unified method to make comparative studies.

Sound perception

Sound may be described as a mix of tones or other acoustical components, with different frequencies (Hz) and amplitudes. Any individual sound can be characterised by its acoustic spectrum (a diagram presenting the frequencies and amplitudes contained in the sound) and by its time structure.

A speaker or singer has a voice with a high or low **volume**, a high or low **pitch** and a special **timbre**. The volume depends on the amplitudes and the pitch on the frequencies of the most important acoustic components in the spectrum, while the timbre depends on the spectrum as a whole.

If you speak in a normal way there is a "normal" distribution of high and low frequencies in the speech. During a whisper the volume is lowered but the distribution of tones (the timbre) is also changed. The voice becomes darker. With a shout, the voice becomes brighter. In the perception of sound, this change of distribution of tones in the spectrum is important. If the sound of a whispering voice is amplified

⁸ Weis, Elisabeth & Belton, John (ed) *Film Sound, Theory and Practice*, (New York: Columbia University Press 1985) p. 289-345.

electronically it is still experienced as a whisper, and as such as a typical sound with low volume. A scream reproduced at low volume is still a scream and as such a typical high volume sound. Furthermore, proximity to a voice means high volume and distance low volume, but for the estimation of range, it is the character of the sound, the pitch and possibly the signs of reverberation that are important.⁹

That the **character** of a given sound rather than volume is the **key factor** in interpreting whether words are spoken with a low, normal or a high voice and whether it is spoken near or at a distance, is of great importance to the reproduction of sound in films. If different sounds are recorded separately it is possible to present them in such a way that the level of volume is adjusted with the clarity of all of the sounds in mind. In a scene with two people whispering in a busy street the volume of the whispering can be increased without losing its character.

When phrasing a speech it is normal to fluctuate in volume. To be easily understood it is better to have the power more evenly distributed over time. Sound technicians therefore usually "compress" the volume fluctuations of the sound; raising the lower parts and lowering the high parts. The change in timbre is still there and that is the important thing in the perception of sound character.

If there are a few seconds of silence the sensitivity in the hearing system starts to increase. After a while you start to hear quiet sounds such as a watch ticking or an insect crawling. A sudden loud sound would in that situation make you jump out of the seat. This change in the sensitivity, a kind of volume control in the brain, is called the "**stapedius reflex**".¹⁰ It works both ways. When you are exposed to a very loud sound, the volume control is turned down, to protect your hearing. Awareness of this reflex is very important in sound recording and reproduction. Most thrillers and horror films use it when it is planned that the built up tension is to explode in a shock but it is also used in the performance and reproduction of symphonic music.

Anyone with two functioning ears can decide from where a sound comes. The ability to estimate the direction is suppressed if the sound is diffused by several loudspeakers with the same sound or by the fibres in a film screen. The audience confronts a sound wall. The human brain then interprets that the sound comes from what the image indicates to be the source, **the ventriloquist-effect**.¹¹

⁹Jägerskog, Arild, *Massmedieljudets villkor*, (TV akademien vid Sveriges Television, 1996) p. 21-22.

¹⁰ Ibid p. 36

¹¹ The ventricular and cocktail party effects (which is taken up later) are described in many articles. See for instance Maasö Arnte, *Lydkonvensjoner i lydfilmen*, (Oslo: Norsk Medietidsskrift Nr 2/ 1995).

There were no problems in interpreting the direction of the sound source in mono as long as it was clear and "on screen". Very early a convention was established that the loudspeakers should be placed in the centre of the screen. Even nowadays speech in stereo sound is mixed by the sound engineers so that the speech is "placed" close to the middle even if the person talking is on the side. The rear loudspeakers are reserved for ambient sound and sound effects.

It is difficult to estimate the direction of off-screen sound in mono. If a door is opened off-screen somebody has to look in that direction to make it understood by the audience where the door is placed. Stereo sound opened up new possibilities for off-screen activities. The off-screen world can introduce itself with different sounds and needs no cue on screen.

Off-screen sounds can also be an aid to **spatial orientation**. In mono sound films there is a need for a wider view at first, an establishing image, to give the audience an orientation of where the action takes place. With stereo, all or some of these visual orientations can be deleted; stereo sound gives the necessary spatial orientation.

The image is, for the human eye, a **field** that the gaze sweeps over to orientate without losing a sense of the totality. Human hearing is more concentrated at one **point** at a time.¹² This human ability to focus on sound from one direction and suppress all other sounds is called the **cocktail party effect**. Two functioning ears are needed for this effect, which is based on the ability to analyse the two incoming signals and filter away sounds from all directions except one.¹³ It is also dependent on the listener's willingness to focus on one sound source. The listener can choose to listen to everything around him or focus on a particular source.

If in a film you follow a person's subjective listening in a crowd, it is equivalent to the camera simulating the gaze, the focus and the volume will vary. In mono sound this simulation must be done on the sound score. In stereo sound it is possible to create an environment where part of the focusing is handed over to the audience. If ambient sound is increased in mono it will quickly come into conflict with the clarity of the speech. In stereo the situation is different. If you increase the ambient off-centre sounds these will automatically be perceptually suppressed if there are interesting sounds in the centre.

¹² Chion, Michel, *Audiovision: Sound on Screen*, p. 10-11.

¹³ A simple experiment that illustrates this effect is to put a finger in your ear when you listen to a lecturer who doesn't use a microphone, in a room with normal reverberation. One can then hear reverberation added to the speech, that the brain normally filters away. The reverberation comes as an echo from different parts of the room.

This active process of acoustical focusing increases the illusion that you are there among the actors in the film.

The main speech sources are often placed in the centre of the screen and the ambient sound and sound effects are located in the side or rear loudspeakers. It is then possible to let the ambient sound remain at a relatively high level without blurring or interfering with the speech. In mono sound this is not possible. There, ambient sounds must be suppressed almost completely to be sure that the speech is heard clearly.

Lip-reading is something we all do everyday. In conversation it's normal to look into the speakers eyes but if it is noisy we always look at the lips. Speech is easier to understand if the lips and the surrounding area is seen. For cinema this means that if lip-movements are clearly shown, more background noise can be allowed.¹⁴

The frequencies of sound that make speech intelligible are mainly situated between 3 and 5 kHz.¹⁵ That is where one can find the spectrum of unvoiced consonants (F,H,K,P,St, Sch,Tj,D). If speech is mixed with music that has a lot of its energy within this range (for instance cymbal or other percussion sound) it is difficult to make speech intelligible, unless the music is set at a very low volume. Other sounds, (music, noise and reverberation) in that frequency range, have to be altogether less than 5-10 % of the speech level in order not to destroy comfortable listening and understanding for spoken words.¹⁶

There are two ways to solve this problem. One is to arrange the music with a suitable choice of instruments so that the music has its most powerful components outside the critical range for speech (sound with **soft profile**). Another way is to **interfoliate**, which means that when somebody talks or sings, the music is soft but it can have a **hard profile** inbetween (with strong components in the critical frequency range). Soft sounds mix well with speech (train sounds or high pitched violin music together with speech), but hard sounds (speech, fireworks noise, percussion sounds) or even two soft sounds (traffic noise and storm at sea) don't go together. At least one of the sounds gets blurred.

If these methods fail to work some other technique may help. In the speech spectrum the frequencies from 0.5 to 1 kHz where sound from vowels are situated, can be increased together with frequencies

¹⁴ Lip-reading has a strong influence on the interpretation. If the sound is clearly "ba" but the lips say "ga" it is always interpreted as "ga". Experiments done by Telia. Information given by Norman Gleiss.

¹⁵ Tones with frequencies 3-5 kHz are situated at the highest octave of the piano. Tones with frequencies around 0.5-1 kHz where the vowels are found are situated at the fifth octave.

¹⁶ Jägerskog, p. 49-50, 26.

around 3 kHz. Alternatively, music components around these frequencies can be reduced or cut away if it does not destroy the music.

Many ambient sounds have a hard profile and they are therefore difficult to combine with speech. With a sound system that does not allow frequencies above 10 kHz most of these sounds are lifeless and pale. Stereo sound systems that included higher tones came with the magnetic sound systems of the fifties and Dolby systems of the seventies. This opened new possibilities for combining ambient sound and sound effects together with speech or music. The great advantage with **stereo sound** is not only that the listener can perceive from where the sound comes but the spatial indication also **increases the separability** of different sounds. For a music listener it is not so important to identify where the different instruments are placed; the important thing is to separate them. What a music lover calls "spatial feeling" with stereo also opens up the possibility of separating the sounds.¹⁷ For the film audience directional information is of greater importance. Moving stereo sound can give an interesting dynamic experience.

Straight direct sound recording and sound that is conceived of as true or realistic are different issues.¹⁸ A sound's "credibility" depends more on established conventions in film and TV than on direct experiences.¹⁹ Often do the members of the audience have no experiences of their own to relate to, for instance war sounds, car crashes or chandeliers falling down.

Sounds that **recreate a broader feeling of presence and reality** are conceived as **more true** than a directly recorded sound. If you happen to be close to a car crash you will perceive that event also with senses other than vision and hearing. You may feel a draught and vibrations in the ground. The crash creates a sense of bodies getting hurt and of pain and G-forces. When this package of experiences is communicated in image and sound it is perceived as natural, realistic and true if the sounds are reproduced (represented) at a violently high volume, with elements of piercing sounds and temporal expansion i.e. very different from a straight sound recording.

This connection between the senses has made it common to exaggerate sound when it is linked to an activity in the image. If a window is opened the ambient sounds from outside are exaggerated. If someone turns around, the timbre of the voice changes distinctly. Punches against a body are given

¹⁷ Information from Telia's acoustical expert Norman Gleiss.

¹⁸ Direct sound means here original production sound. Straight means without manipulation.

¹⁹ Persons who mostly listen to music from CD records may feel that the music in a concert hall sounds "unreal". This peculiarity applies to instruments with sounds that do not "carry" very far such as the harp and

heavy sound marks. Such exaggerations and distinct marks, "expressive" sound editing, is normally perceived as "true" sound. A pure reproduction of the sound would be experienced as tame and unrealistic.

A sound is perceived as **close to reality** if it conveys a feeling **of which material** (wood, stone, metal, leather fabrics) created it and **how** (friction, blow, shakings, vibrations) it was created. A large frequency range and a clear development of the sound are important for understanding the link to reality. Footsteps can be abstract and more marked in their rhythm to indicate that someone is approaching, but they can also be lively and indicate material (leather, rubber) and foundation (wood, stone). The notion of movement can be supported by the friction sound of fabric. Speech that also includes breathing sounds, hawking and coughing, and sounds with irregularities and surprises (a note in the wrong key) are perceived as close to reality.

Sound technique development.²⁰

By 1932, five years after the birth of the sound film, most of the basic initial technical problems had been overcome. Directional microphones had been developed. It was possible to make multi-track sound recordings which were subsequently mixed into one track. There was a good synchronisation of sound and image. The sound system, which was based on optical recording with the sound track on the film, was robust and worked well.

However, it had clear limitations. There was only one sound channel and the frequency range was limited to 10 000 Hz. A human ear can normally hear tones up to 16 000 Hz and this means that high

harpichord which may be experienced as rather flat and tame. On CD all instruments are generally felt to be close by. Viewpoint from Telia's acoustical expert Norman Gleiss.

²⁰ Facts in this chapter are in broad terms, (important details get a special note) taken from the following sources:

- Altman, Rick (ed.), *Sound theory/ Sound Practice*, (New York:, AFI Film Readers, Routledge 1992) p. 46.
- Boggs, Joseph, *The Art of Watching Films*, (Mountain View, California: Mayfield Publishing Company 1996) p. 212-235.
- Stewart, James G," *The Evolution of Cinematic Sound, A Personal Report.*" Cameron, Evan William (ed.), *Sound and the Cinema; The coming of Sound to American Film*, (Pleasantville, New York: Redgrave 1980) p. 39-67.
- Maasö, Arnte, *Lydkonvensjoner i lydfilmen*, (Oslo: Norsk Medietidskrift Nr 2/ 1995).
- Belton, John, "Technology and Aesthetics of Film Sound." Weis, Elisabeth & Belton, John (ed.), *Film Sound, Theory and Practice*, (New York: Columbia University Press, 1985) p. 63-72.
- Handzo, Stephen "A Narrative Glossary of Film Sound Technology." Weis, Elisabeth & Belton, John (ed.), *Film Sound, Theory and Practice*,(New York: Columbia University Press, 1985) p. 383-426.

tones are left out. The possibilities of extending the optical system towards higher frequencies were at this time limited. There was no strong pressure to do this. The main opinion was that the system adequately covered speech and most of the music.

This limitation led to essential restrictions in the use of ambient sound and sound effects. Without the high frequency parts, insect sounds, nails drawn over nylon stockings, footsteps on stone steps, creaking doors (often glissandi up towards high frequencies) become lifeless and empty. It also makes it difficult to discriminate between different sounds that appear at the same time. Most ambient sound and sound effects come into conflict with speech thus making it difficult to combine the two. To achieve clarity the different sound components have to be separated in time (interfoliated) or presented through different loudspeakers.

The next step in the development was when the sound was recorded on magnetic tape. Magnetic tape technique (a German innovation developed during W.W.II) was introduced just after the war for sound recordings and had its breakthrough 1950-51.²¹ It had many advantages. The frequency range was much greater. The dynamic range (the possibility to shift between high and low volume) was greater. The fidelity in the sound reproduction was higher, the hiss level lower. It was easy to mix and the loss in quality in each processing step with the optical technique could now be overlooked. There was no problem in building up the sound piece by piece in several steps. The sound could be recorded from different microphones. The speech could be individually separated. A technique to synchronise different channels with each other was developed. For **recording purposes** the magnetic sound has since then, been totally dominant.²²

There were, however, disadvantages with the technique of magnetic sound reproduction from the film. The copies for reproduction became very expensive and the theatres had to buy new equipment. When CinemaScope (4 channels) and Cinerama (6 channels) were introduced the sound was put on magnetic tape. At the same time stereo was introduced. The first Cineramafilm *This is Cinerama* (a series of short films) came in 1952 and the first CinemaScope film *The Robe* (Henry Koster) came in 1953.²³ Some theatres, especially the big ones, adjusted to the new technique but most did not. In the end of the

²¹Altman, Rick, "Evolution of Sound Technology", Weis, Elisabeth & Belton, John (ed.), *Film Sound, Theory and Practice*, (New York: Columbia University Press, 1985) p.48.

²²Belton, John "1950s Magnetic Sound: The frozen Revolution", Altman, Rick (ed.), *Sound Theory/ Sound Practice* (New York: Routledge 1992) p. 156. That the digital technology will take over in the future is obvious.

²³ Boggs p. 216.

fifties only a quarter of all cinema theatres in USA had installed equipment for magnetic sound.²⁴ For those theatres that couldn't take magnetic sound, copies with optical sound were produced. The quality of the sound in those copies where the stereo had been merged to mono and the high frequencies cut out, was not high.

In the period after most producers returned to Academy ratio (1:1,33) and mono sound, the development of magnetic sound on film came to a standstill. Many producers refrained from magnetic sound because it was not possible to reach all theatres. The big stereo and wide screen films were often historical dramas with gigantic mass scenes and that had formed a public conception that colour stereo and wide screen stood for "spectacle" while black and white, mono and normal screen represented realism.²⁵ This too made producers refrain from the expensive magnetic tape on film. It is asserted that the quality of the sound reproduction in many theatres with optical sound for some time stagnated and even deteriorated.

Optical sound was gradually improved in quality but remained only mono.²⁶ Many of the films in the sixties and beginning of the seventies were innovative in their use of sound.

To get powerful effects in the low frequency area the "sense surround system" was tried in the middle of the seventies. With the aid of two very big loudspeakers in the rear part of the theatre it was possible to create substantial shake effects. The system was used in very few films (*Earthquake*, Mark Robson 1974 and *Midway*, Jack Smight, 1976).²⁷

Great changes had taken place in music technology during this period. With LP discs came two-channel stereo. In the middle of the sixties Dolby introduced a hiss reduction system that increased the quality of the sound reproduction substantially. In the beginning of the seventies the resources for sound reproduction were far better in the home than in film theatres.

The third film sound revolution came with the Dolby system in 1974. It had its great breakthrough with *Star Wars* (George Lucas 1977). Dolby was a signal processing system that could both reduce hiss and transmit four-channel sound via two optical tracks on the film.²⁸ With it came dual stereo sound (right,

²⁴ Belton "1950s Magnetic Sound: The frozen Revolution", p 156.

²⁵ Ibid p. 160.

²⁶ That the optic sound was improved is my own judgement. If you compare films from the sixties and the seventies this shows very clearly.

²⁷ Boggs, p. 216.

²⁸ In Dolby's hiss reduction system all frequencies where you don't expect high volume sound are more amplified than the others before the recording and then afterwards reduced in the same proportion when

centre, left and rear) with high quality at a relatively low price. The frequency range extended to 18 000 Hz which was more than any loudspeaker system normally could take, the hiss was low and the dynamic was high.

The Dolby system from 1974 was built on analogue principles. Later, a system with traits of digital principles was also developed. With digital technologies it is possible to pack the information more densely and in a given space more information can be transmitted allowing additional channels to be added. For a listener it is not such a radical difference if the film uses four-channel sound, but it opens up new sound reproduction techniques. In the long run digital techniques will undoubtedly take over.

For the first time there was a system which could produce distinct and realistic ambient sound and sound effects where films could get a broad distribution. After some time the Dolby Surround Sound system, with a 360 degree sound field was introduced. The sound source could be placed in an arbitrary direction. A well known example of the early use of this occurs in *Raiders of the Lost Ark* (Steven Spielberg 1981) when the hissing snakes surround the audience.

It is from this time that new sound possibilities in film opened up. A time of experimental activity with new sounds began, often totally synthetic but with sounds fetched from real life and manipulated in different ways.

With THX the techniques have improved further. THX takes on where Dolby left off; improved loudspeaker systems, improved acoustics in theatres etc .²⁹

The technical possibilities/restrictions over time appears as follows:

- Up to around 1950 the frequency range was limited. There was only mono sound. Ambient sound and sound effects were lifeless.
- The new magnetic technique opened great advantages from the beginning of the fifties. It was possible to record the sound in different channels that were synchronised with each other through time-pulses. The possibilities of mixing sound increased. Reproduction with magnetic sound gave several channels and high quality but was relatively expensive.

reproduced. In this way you get a better relation between hiss and signal volume. Dolby Spectral Recording (Dolby SR) that is the basis for the four channel system contains a more extensive breakdown and coding of the sound, separation of different frequency intervals, adding and subtracting of frequencies. Source: Information from Tolia's acoustic expert Norman Gleiss and Handzo, Stephen "A Narrative Glossary of Film Sound Technology." Weis, Elisabeth & Belton, John *Film Sound Theory and Practice* .

- From the middle of the seventies the Dolby system could (with a signal processing technique utilising an optical sound system) transmit four channels of sound in good quality.
- With THX and digital sound continuous improvement of sound quality has taken place.

Sound ideologies

David Bordwell has recently published a historiography of film style.³⁰ He shows that as a first approximation, the history of style can be divided into three epochs with different views on what was the driving force behind the development. Bordwell focuses on film image but his discussions have relevance for sound as well and I follow his classification.

In the **Standard Version** historians, mostly active during the silent era, argued that film style could be understood as a development toward the revelation of cinema's inherent aesthetic capacities.

The **Dialectic Program** launched by André Bazin and his contemporaries presented in the mid-forties up to end-fifties heralded a very different view. They attacked the belief that cinema gains its artistic power by stylising or transforming reality. Cinema was not like music or abstract painting; it was a storytelling art, with close kinship with the novel and the theatre. It was a popular art. The "avant garde" cinema had become stuck in a blind alley. The advanced studiofilm-making of the sound era was the real "avant garde". The strength was its ability to describe real life. Good examples were Jean Renoir, William Wyler, Orson Welles and the Italian neorealists.

Around 1960 European directors launched what came to be recognised as modernist cinema. In what Bordwell calls the **Oppositional Version** a new view on style emerges as a response. He uses Noël Burch and his writings as an example of this tendency. Burch advocated a film form that was more open to the aesthetics of the silent era. The essence of cinema was, according to him, the abstraction of the purely concrete, the integration of the elements of concrete reality into abstract patterns in such a way that these elements lose their significance without losing their identity.

²⁹ LoBrotto, Vincent(red), *Sound on Film, Interviews with Creators of Film Sound*, (Westport: Praeger Publishers 1994). Interview with the man that together with George Lucas created THX, Tomlinson Holman, p. 201-209.

³⁰ Bordwell, David, *On the History of Film Style*,(Cambridge, Massachusetts, London: Harvard University Press 1997)

The purpose of the following notes on sound ideologies is to briefly illustrate the main factors that have been at stake when discussing sound ideologies in film. For several reasons most space is given to classical writings related to the Standard Version. These ideologies are formulated by theorists with their background in the silent era. The introduction of sound in film made them produce interesting ideas and programs. Later theorists have, with some exceptions, been less explicit in their sound strategies.

In the Standard Version sound ideologies are determined by a quest for cinematic specificity, the "essence" of film as art.³¹ For theorists of the silent film, the essence lay in the image. The introduction of sound, or more particularly of speech, posed tremendous problems for the champions of **pure cinema**. The addition of speech threatened the hegemony that the image had exercised over cinematic expression for more than thirty years. The presence of verbal language seems to threaten their notion of cinema as another kind of language. Concrete verbal structures call into question the figurative systems in which classical theorists sought to ground the cinema as an art.

It was the "talkies" to which they objected; sound effects and music were accepted. As is shown in the following notes they had very different ideas of how these sounds should be used. It is very interesting to note the "modern" view some of them have on the use of ambient sound. Some of those visions could hardly be realised at the time they were written.

In 1928, three Soviet directors S.M.Eisenstein, V.I.Pudovkin and G.V.Alexandrov published a joint statement advocating a purely **contrapuntal interplay of sound and image**. A photograph of an object tends to "neutralise" that object by cutting it off from all surrounding reality, transforming "nature" into a block of material which the editor can use in assembling a work. The coincidence of sound and image threatens this process by restoring power and autonomy to the photographed object. A contrapuntal use of sound will prevent the sounds and images from being linked to the world from which they derive and enable them to function as neutral fragments of material whose potential meaning is realised in a montage sequence.

Pudovkin, though a co-signer of the statement, holds a somewhat different view in his writings 1929. He there sees "asynchronous sound" as a means of enriching rather than neutralising the image. For Pudovkin **sound in cinema resembles human perception**; it does not duplicate events but rather affects the way we perceive them. Contrapuntal manipulation of image and sound enables the director to

³¹Weis, Elisabeth & Belton, John (ed) *Film Sound, Theory and Practice*, p. 75- 176. All material related to the Standard Version is taken from this book that outlines the questions in more detail, a book I strongly recommend an interested reader.

duplicate the course of a character's or spectator's perception. Pudovkin presents a program for associational approaches to sound and image.

The French director René Clair in an article (1929) was critical of the talking film but just as actively celebrated other sound films. An **asynchronous** use of sound would provide a new **method of expression**. Through a careful selection and organisation of sounds, film makers could liberate the cinema from "theatricalism" and thus recapture some of the "poetic energy" that animated the silent film.

In Britain, documentary director Basil Wright and a critic, B. Vivian Braun in a manifesto (1934), dismissed talkies as filmed stage plays. De-emphasising counterpoint as the sole device appropriate to sound aesthetics they call for a more **general "orchestration" of sounds accompanying images**.

Alberto Cavacanti, a colleague of Wright, advocated in an article (1939), a **non-naturalistic use of sound**. He based his advocacy of asynchronous sound on the different natures of images and sounds, especially as they function in the documentary. Images provide literal statements, while sounds introduce non-literal suggestions. Films should not be content merely to reproduce reality. Like Pudovkin, he feels that sound can enable the cinema to achieve a **more exact rendering of reality**, in particular **emotional reality**. The sound film can through its suggestiveness, directly address the emotions of the spectator.

Another attack on the talkies came from Rudolf Arnheim. He emphasised those aspects of the cinema that call attention to film as form. The addition of **sound**, which **reduces the gap between film and reality**, **threatens the artistic status** of the medium and is thus opposed by Arnheim. For him the primacy of the image in the cinema is total; there is no room for anything else. Speech is either redundant or at odds with the image, preventing a true fusion of the two media and thus frustrating the aesthetic viability of the sound cinema.

In earlier writings (1923), Bela Balazs argued that mankind **lost its ability to read faces** with the development of the printing press and the resultant translation of all experience into the medium of language. The cinema restores this lost ability, re-educating our senses so that we can once again decipher the visible world. Celebrating the cinema as a wordless language, Balazs sees the coming of sound and the introduction of speech as a something that severely limits the universality of the cinema. In later writings (1945) he declares that for him the potential of the sound lies in its ability to **recover**

certain **"lost" sensations** for us, such as the sound of objects or nature, the sounds of certain spaces, or the sound of silence. He stresses the **spatial qualities of sound** that endow it with the timbre or colour of the particular space in which it was recorded.

Siegfried Kracauer, like Balazs, sees film as a means of explaining and exploring physical reality for us, **making visible what we did not or could not see before the introduction of cinema**. He favours a truly "cinematic" dialogue, where the irrational, material qualities of speech should be stressed. Stripped of its conceptual meaning, speech becomes the equivalent of sound effects and music, capable of recovering the expressive purity of man's pre-linguistic utterances at the dawn of civilisation.

Jean Epstein, another of the theoreticians that advocated "pure cinema", also emphasised the **non-literal aspects of sound**. Less interested in speech than in the sounds of nature and objects, he seeks through slow-motion processes, to reduce sounds to their "essences". By "discovering" a common denominator among all sounds that enables them to "speak" equally, Epstein thus erases the hierarchy of sounds, in which speech has a more prominent "voice" than objects.

Film makers brought up with sound, not only accepted the talking films as given, they gave sound another status. While an earlier filmmaker such as Clair viewed asynchronous sounds as a means of serving the image, Robert Bresson endows the **sound track** with an **independent status equal to that of the images**. For Bresson sound should replace not complement an image. For Clair the sound "liberates" the images. For Bresson it is the sound or the image that is the channel to the viewer.

The key word for the Dialectic Program is **realism**. For Bazin the filmmaker should try to represent reality in opposition to the silent film's urge to reconstitute it. Cinema is a medium first and an art only secondarily. Bazin's view is that the aesthetic basis of cinema and the driving force behind stylistic change both stem from cinema's reproductive power. Other arts present reality through symbols. Cinema's photographic basis permits it to reproduce tangible, unique events. From this capacity to record the world springs the specific qualities of filmic realism.³² Implicit in the strive for realism was a preference for direct recorded sound. Bazin has however, to my knowledge, not formulated a principle in that direction. The filmmakers that according to Bazin well fitted into his ideology were Jean Renoir, Orson Welles, William Wyler and the Italian neorealists and all these used post-recorded sound to some extent.

³² Bordwell p 71-72.

The question of direct sound versus post-recorded sound has been a major issue ever since. The technical possibilities of producing direct sound improved with the new equipment in the early sixties, and Jean-Luc Godard has in some period consequently used direct sound. The most extreme advocates in modern time for direct sound are Jean-Marie Straub and Danièle Huillet. They strive for the integrity and simplicity that early sound film possessed before the advent of mixing and re-recording. Post-recorded sound violates the integrity of sound and space, by recreating spaces through the mixture of direct and re-recorded sound. Both practices transform space, but those of direct sound respect it. By filming in real settings with direct sound techniques which eschew manipulation, the Straubs create a documentary record of the sound and space that has an inviolable purity. Direct sound redeems their "stories", "characters" and spaces from the artificial, Esperanto-like, manufactured world of "bourgeois representation".³³

By 1960 realism gave way to a new stylisation. In the *Oppositional Version* Burch uses a formalist approach to isolate the ways in which sound functions "dialectically". The basic dialectic of sound and image is broken down into oppositional subsets, such as direct and post-recorded sound, and into various mismatches, such as long-shots with close-up sound. Basic categories as speech, music and sound effects introduce a range of possible permutations in their combination; for instance, speech can be rhythmic, or sound effects can be orchestrated. For Burch, the various modes of interaction among these categories have dialectical implications for the aesthetic organisation of the sound track, implications that, unfortunately to his view, are ignored by many. To Burch all sound alternatives can be used but in a logical way. He means that the most fully achieved film will organise its parameters according to some larger structure.³⁴

Examples of how ambient sound and sound effects can be used.

There are several factors behind the breakthrough for ambient sound and sound effects with the introduction of magnetic reproduction and later with Dolby:

- With a larger frequency range these sounds get more life. The sounds help to develop the atmosphere and to range the image on screen into space and time.
- New stimulating fantasy sounds with emotional connotations could be developed. Some were totally synthetic, others were based on natural sounds which were distorted.
- In stereo the ambient sound and sound effects could give life to the off-screen space. It gained an independent character.

³³ Weis& Belton p 146.

- The new technology allowed for the co-existence of several sounds. It was possible to get a thicker, more realistic, sound score.
- With stereo the audience's own ability to use the cocktail party effect could be used to increase the illusion of participation in the film.
- In stereo the ambient sound and sound effects help the audience in their spatial orientation.

The following examples give a picture of the possibilities that exist and the richness in variation.

Speech and ambient sounds are woven together.

In *McCabe and Mrs. Miller* (1971) Robert Altman brings out the **ambient sounds**. It is detailed, rich and thick. Everything sounds realistic; the rain, a chair scraped along the floor, mumbling poker players dialogue, a jar that is sliding on ice, reverberating shot sounds. Often sound is stacked on sound, speech on speech in different layers to create a feeling of presence.

The speech is not dominant. The dialogue is not given the same dominant role it has in other films, part of it is blurred by the ambient sounds. The stamping and scraping of feet against a rough wooden floor is mixed with mumbling naturalistic dialogue. When the protagonist walks slowly through a packed saloon someone in the bar is telling a joke, but the end of it is not heard; it is drowned by the sound of the footsteps in the stairs.

Horror. Violence.

Horror can be underlined through high volumes. Steven Spielberg asked the composer John Williams to use a sudden strong chord in one of the horror scenes in *Jaws* (1975), when a face suddenly appear in the glass window at the bottom of the boat. Spielberg describes this in the following way:

The chord of course, comes after the face comes out. First you react to the face, then the chord comes a fraction of a second later. It's very easy to scare people with noise, to lift you from the chair with a loud sound. John Carpenter does it with his films all the time. Billy Friedkin did it in *The Exorcist*, with the bureau drawers opening- it wasn't scary to hear the drawers opening, but he had the volume turned up all the way, and you jumped out of your seats when you heard it in Dolby stereo.³⁵

Also **violence** can be underlined through high volume. Example of this can be seen in *Bonnie and Clyde* (Arthur Penn 1967) or in *The Wild Bunch* (Sam Peckinpah 1969). In both these films there is a dramatic final scene with a long extended gun fighting sequence. The volume of the sound has here been increased to a maximum. In *Bonnie and Clyde*, when the shooting is over, there is a long period of total silence which further strengthens the effect. In *The Wild Bunch* the scene starts from total silence.

³⁴ Weis & Belton p 179.

³⁵ Boggs, p. 227.

Slow-motion sound.

By putting in **special sounds** in **slow-motion** scenes it is possible to increase the effect of elongated movement. In *The Long Riders* (Walter Hill 1980) there is a long slow-motion passage in the shooting scenes at the end. The slow tempo brings the viewer closer to the individuals of the gang and the slow-motion sound that consists of vibrating tones and elongated ricocheting sounds reinforces our experience of pain when the bullets slowly tear apart muscles and internal organs as they go through the body.

In *Raging Bull* (1980) Martin Scorsese uses slow-motion sound in the crucial boxing match to show the protagonist's tiredness and to isolate the effect of individual decisive blows.

” Natural” sound effects.

Sounds that should be natural are not always recorded from a situation that resembles the one in the film. The sound of the punches in a boxing film is not recorded at a simulated match. That would come out as bleak and tame. The boxing sounds are built up from a variety of sources, many of them very surprising to a layman. Frank Warner who was responsible for the sound in *Raging Bull* has recounted that the sound in the final scene was built up of fifty different components:

It was done in combining sounds. A very basic part of the punch is hitting a side of beef - that's always been used from day one. That could be your basic beat, but then you can go from there. When a guy is hit and you see it just ripping, tearing the flesh, you can take a knife and stab and you get a real sharp, cutting sound. As the flesh gives away, water would have been added to the punch. The splatter was all done separately.³⁶

Synthetic sound with emotional connotations.

Ben Burt, who was responsible for the sound of *Star Wars* (1977), got from George Lucas the task of creating sound that could relate to reality, preferably ”organic” sounds in contrast to the electronic and synthetic sounds that earlier dominated similar films. The task was to find sounds that the audience could empathise with.

I want a certain feeling. People have been exposed to music, therefore they have associations with certain instrument groupings to perform certain emotional functions and a tempo that creates a rhythm which then has an emotional association. I think our everyday experiences with sound in the real world perform the same kind of learning situation on the average person. They do not know it, but they have all kinds of little buttons that can be pressed. If you press the right button, it will make them feel a certain way. This is the basis for music, and it's the basis for selecting sound effects in a movie.³⁷

³⁶ LoBrutto, p. 36.

³⁷ Ibid. p. 143.

The sound of the **Imperial walkers** was created from a printing press combined with the sound of cycle chains dropped in cement. The sound of **R2D2** came from water tubes, whistles and Ben Burtt's voice where he imitated a grumbling baby. The sound of **Chewbacca** came from a walrus and other animals. Evil and good **laser sabres** were tuned differently. There was dissonance when they met.³⁸

The ewokesian language was created from modified Tibetan, Mongolian and Nepalesen languages .

Ben Burtt describes it like this:

I broke the sounds down phonetically and re-edited them together to make composite words and sentences. I would always use a fair amount of the actual languages, combined with purely made-up words. With a new language, the most important goal is to create emotional clarity. People spend all of their lives learning to identify voices. You become an expert at that, and it's somewhat impossible to electronically process the human characteristics, and retain the necessary emotion. To fool the audience into believing this is a real character as the basis of the sound, although you may sprinkle other things in there. It varies from character to character.³⁹

Sound to differentiate surroundings.

The Hunt for Red October (John Tiernan 1990), takes place on board three submarines and it was important to give them different characters. Two were Russian, one old and one very technically advanced. The third was American. The American submarine "Dallas" got a very clean high technology sound. A friendly atmosphere was created on board by including well known sounds like popular office machines. In the murmur from the crew (so called "walla") well known cities and sport teams Yankees, Dodgers etc. were put in.

The new Russian submarine should have had an advanced technology, superior to Dallas, but it had to sound like it didn't function as well as the Dallas. The Russian submarine was given a complicated sound, but harder and more metallic. It had to sound different and foreign. Much work was devoted to making it sound strange. The older Russian submarine was simpler. It sounded very primitive and clattering.⁴⁰

Sound that change character.

In the beginning of *Apocalypse now* (Francis Coppola 1979) the protagonist is sleeping in a hotel room in Saigon. He wakes up and looks out the window. One can hear off-screen traffic noise, a policeman's

³⁸ Carson Sven E. Sound Design of Star Wars. From Internet : <http://hem.passagen.se/filmjud/starwar.htm>

³⁹ Ibid.

whistle, car horns, motorbikes. A fly is buzzing in the windowpane. He sits up on the bed and the narrator (himself) tells of his longing to be in the jungle and that he can't stand being locked in a hotel room. Gradually, all the earlier sounds change into jungle sounds. The police whistle transforms into a cricket, the car horns into different birds and the fly into a mosquito.⁴¹

The helicopter sound, which is an important ingredient in the film, is to a large extent reconstructed. The sound recording from a real helicopter had been divided into different components and with those it was possible to reproduce realistically, or if so desired a distorted version of the sound of a helicopter in different situations (take off, landing, high/low rotation etc). It was possible to play with this sound like an instrument and let it change character to gradually transform it into other sounds.

When the protagonist wakes up in the hotel room he looks up at the fan in the ceiling. The fan wings are rotating. This sound is then gradually transformed into a helicopter sound. He walks up to the window and there is a helicopter passing by.⁴²

Sound used to tell an internal story.

In *On the Waterfront* (1954) Elia Kazan employs the sounds of the waterfront to dramatise the emotions of the two protagonists Terry and Edie. When Terry walks towards Edie, whom he loves, to tell her that he was involved in the planning of what led to her brother's death, the rhythmic hammering of a pile drive which begins as background sound, gradually gets louder and more intense (Terry's internal feelings). When he is about to tell her the horrible things, we hear the shriek of a steam whistle. We are now inside Edie, feeling the disbelief, the unwillingness to hear and the shock when she realises it is true. The faces and the "internalised" sounds tell the entire story.⁴³

Ambient sounds which create a sense of temperature.

Skip Lievsay describes how he tried to create a sense of heat in *Do the Right Thing* (Spike Lee, 1989):

Certain backgrounds like a breeze in the park, nice birds, and happy things just seemed to us to be too cooling. We went with a dry traffic sound. We did find, if we used a little more top end, it would seem just a little bit hotter. For the sequence where people take showers, I recorded some sound effects, and the hottest one by far was the one that seemed the most like steam; it was a very sizzly sound. The tubby,

⁴⁰ LoBrutto, p. 191. Interview with Cecilia Hall that received an Oscar for the sound editing of *The Hunt for Red October*.

⁴¹ Paine, Frank "Sound mixing and Apocalypse now: An Interview with Walter Murch." Weis, Elisabeth & Belton, John, *Film Sound, Theory and Practice*, (New York: Columbia University Press 1985) p. 354-360.

⁴² LoBrutto, Vincent, *Sound-on-Film: Interviews with Creators of Film Sound*, Praeger Publishers 1994. Interview with Walter Murch that edited the sound in *Apocalypse Now*. Page 92-93

⁴³ Boggs p. 222.

gurgling sound was much more cooling, so we used the sizzling one instead. The dull traffic we used in the picture made that block seem more remote, almost like it was out in the desert.⁴⁴

Using sound to focus.

In many films the director wants to focus the audience's attention on the narration and uses ambient sound very selectively. Skip Lievsay tells:

Quite often with Spike's movies we don't really have nominal city sounds. We don't have a lot of traffic, we do not have any sirens - unless you see police cars - no crying babies, no screaming, no shouting matches, because as much as they are a part of ordinary life in the city, they're too dramatic, and it's too distracting to have to sort out where or not dramatically we want to hear those reminders of where we are. The relationship in Spike's movies is more between the people than between the people and their environment.⁴⁵

Spatial orientation.

In *The Fifth Element* (Luc Besson 1997) the protagonist is a taxi driver in a science fiction city. The taxi moves freely in three dimensions, the houses are tall and they stand close. In many scenes he is chased and has to move quickly up and down and make sharp turns. The establishing pictures are few and not taken at great distance. With THX sound is it not a problem to keep the orientation.⁴⁶

Basic concepts for film sound analysis

The concepts must be made **clear**. Some can easily be described in **words**, for others the best way is through **film examples**. Some sound commentators rely on that which people have seen and can remember. That seldom works out very well. The human memory creates its own picture of the event and certain parts of the sound are memorised in the image memory and vice versa.⁴⁷ If the understanding of an analysis is linked to a film quotation this should be shown in direct connection to the text. A CD-ROM presentation make that possible. Personally I think film sound analysis without film quotations has limited explanatory power.

Some **fundamental relations** between sound and image are important to be aware of:

⁴⁴ LoBrutto, p. 264.

⁴⁵ Ibid p. 264.

⁴⁶ In the video version the experience is somewhat lost, unless you have a surround system.

⁴⁷ Chion, Michel, *Audiovision: Sound on Screen* p. 136. I have experienced this phenomena several times myself. The sound was not at all what I remembered it to be when viewing the film again.

- **Sound gives a time dimension to the image.** If music, speech or other sounds are overlapping from one scene to another different scene it gives the impression that time ticks continuously; the cut was just a change in viewpoint.
- Continuous sounds can bind together disparate images, and give them a new meaning when viewed together.(FILM 1)
- **Sound gives meaning to the image and creates illusions** in the viewing. Vice versa the **image gives meaning to the sound.** In fighting scenes (karate) it is the sound which creates the illusion that people are actually hit. Without sound, it is much easier to see that nobody is touched. (FILM 2) If you hear a gurgle from a bathroom, the normal thought would be that somebody is brushing their teeth, but when the camera goes there it can show a man being strangled.

On screen/off-screen and **diegetic/ non diegetic** are useful concepts in sound analysis. There are different possibilities to play with the two on and off-screen spaces, and sound has a major role in this. Off-screen sound is used to build up the off-screen space, and it can be made very rich and lively.(FILM 3)

Diegetic sound has through its presence in the fictional world another dimension than the nondiegetic. The latter can through its outside character do other things like binding different story parts together. There are lots of alternatives where diegetic and non-diegetic sounds can play against each other.

Sometimes sound that has a diegetic origin can be used non-diegetic. Music that starts diegetic can continue into a scene where it no longer can be diegetic (from a restaurant to the street). Such sound that is stretched into another scene is called **extra-diegetic**. A character can in his thoughts or dreams recall a previous situation and a sound from that (a melody) can be heard. Such sound that has a symbolic link to the diegetic world is called **meta-diegetic**.

Active off-screen sound raises questions and directs your attention. Who is coming? Something is happening! Look there! **Passive off-screen sound** creates atmosphere and enriches the off-screen space.

It is difficult to create a **point of audition** linked to a person or a point in the filmic space only by sound. In cinema this is done through the image. In closed and marked off dialogue, where the image is focused on one person, the situation is interpreted as that which the audience hears is the sound the man in focus hears. Sound supports this. Sound that doesn't "carry far", like breathing sounds then become important. If the counterpart turns his face away the sound is changed substantially. In scenes with

several people and with greater distances between the people it is almost impossible to create a distinct point of audition. The sound is common. Point of audition is not defined.⁴⁸

Character of speech sound.

- **Theatrical**
 - Normal speech
 - Inner monologue
- **Narrator**
 - Create narration
 - Intervene in the story (FILM 4)
 - Mobile guide
- **Invisible person**
- **Emanation speech** is speech where the content is not meant to be understood. The emotional part is often very clear.
 - Few words
 - Overflow of words
 - Foreign language. Multi lingualism. Made up language. (FILM 5)
 - Submerged speech
 - Loss of intelligibility
 - Decentering (ambient background sound) (FILM 6)

Character of music, ambient sound and sound effects.

The **character of a sound** can sometimes be defined by its own features, but in many contexts the character is defined in relation to the image. It is clear whether it is one or the other.

Empathetic means that the music or other sounds express the same emotion as the image. Sound is there to support and amplify. (FILM 7)

Anempathetic means that the sound is cold, neutral and without emotion in relation to the image. If the heroine is injured the audience expects empathetic music or other sounds of sympathy. If the surrounding sounds are anempathetic the heroine stands out as totally deserted and the audience's feeling of pity for her increases. (FILM 8)

Ironic sounds express the opposite emotion to the image, and it is understood that this is a joke.

Symbolic sounds represent something, a person, an emotion or even something abstract. Strong emotions of love or hate are usually tied to what is behind the symbol. (FILM 9)

⁴⁸ Chion, Michel, *Audiovision: Sound on Screen* p. 90-92.

Surrealistic sounds are those where the sound-image constellation are surrealistic in the same way as a meeting between a banker and a butcher or a violin and an iron can be.

Counterpoint sound is when sound and image constitute two parallel and loosely connected tracks, neither dependent on the other.

Ambient sound and sound effects can help to build up an **atmosphere**, and can also have a **narrative** function. (FILM 10)

Ambient sound and sound effects are often artificially constructed but to the audience they appear either **natural** or **unnatural**; the distinction is usually very clear. Many unnatural sounds are distorted natural sounds where some parts are still recognisable. Normal speech played backwards creates a special feeling, familiar and alien at the same time. Many sounds have hidden baby cries, howling and other sounds with great emotional connotations. Some of these sounds have been used repeatedly and can be linked to special genres. The phantom sounds that are used in horror films are an example of this.

Consistency of a sound is a heading for how different sound components work together. Each sound component can be clear and intelligible or the sound can be distorted. (FILM 11)

The sound can be made clear in different ways:

- Balancing the volume of each component.
- Separation in time. (First speech, then ambient sound, then speech again etc.)
- Interfoliation, which is the same as separation in time, but in a quicker tempo. The difference is that music or speech is continuing, but in-between the phrases other sound elements are inserted. (FILM 12)
- Separation in pitch. Mixing hard and soft profile sound but not soft/soft or hard/hard.

Smooth editing means that the sound score is a continuous flow with no sharp breaks. All sound cuts are smooth and almost unnoticeable. Rough edges have been smoothed. The opposite is a **rough editing** with **“jump cuts”** in the sound. (FILM 13)

Expressive editing means that the sound or differences in sound are exaggerated when it is linked to an activity in the image. It is important to differentiate between diegetic and non diegetic. Sound can have different editing in the two worlds, and in fact this is very common.

If **sound and movement** are **synchronised**, the movement can be perceived more clearly. The movement gets a structure that makes it easier to follow. The rhythm of the movement is accentuated. The image has some points (end of movements, cuts etc) which are natural to mark and if there is a sound marking at the same point we have a **synch point**. The structure of all these synch points is called **punctuation**. If the synchronisation is very pointed and distinct as it can be in a very choreographed scene it is called **firm punctuation**. The opposite is **loose punctuation**. (FILM 14, 15)

If the sound and changes in sound are geared by emotions linked to people in the image it is called **internal logic**. (FILM 16) If it is geared by anything outside them, diegetic or non-diegetic this is termed **external logic**.(FILM 17)

Sound can influence tempo, it can speed it up or slow it down. This phenomenon is called **temporal elasticity**. (FILM 18)

Sound can influence the audience's **spatial orientation**. The scene can be **flat** or **deep**. With **stereo** you get some spatial orientation, you know from where it comes. With THX you get an almost total spatial orientation, a **super field**. (FILM 19)

Reality Linked Sound Details ("reality links") are small details that cause us to "feel" the material conditions of the sound source and refer to the concrete process of sound production. Irregularities, deviations, random things, unexpected sounds, also belong to this group.

Locality Linked Sound Details ("locality links") are small sounds that are connected to some well known source. These help to create and define a film's space by means of specific small touches (barking of a dog, ringing of a telephone, sound from water pipes etc).⁴⁹

Films sometimes include **other audiovisual languages**. To be taken up it has to have some importance for the film, and the difference in audiovisual language must be noticed. It can be as a documentary part of the film or a TV program, the program itself or the production of it.

- Documentaries
- Television
- Image radio
- Music video

⁴⁹ Chion uses the term Materializing Sound Indices-MSI and Elements of Auditory Setting-EAS. See Chion, Michel. *Audiovision, Sound on screen*, p. 114 and p. 54-55.

FILM 1. The example shows how sound can bind together a number of disparate images and create a time axis. Without sound these would appear unconnected.

Persona (Ingmar Bergman 1966), 3min. First half with sound, second half without.

FILM 2. This example from a Bruce Lee film shows that sound substantiates the illusion that he hits his opponents all the time. Without sound it's obvious that the stick never touches anybody.

Enter the dragon (Robert Clouse 1973), 1 min 35 sec. First half with sound, second half without.

FILM 3. The example shows how Jacques Tati very simply and elegantly creates an off-screen space.

Mon Oncle (Jacques Tati 1958), 1 min.

FILM 4. The example shows an intervening narrator.

Annie Hall (Woody Allen 1977), 1 min 10 sec.

FILM 5. The example shows foreign unintelligible language.

The Fifth Element (Luc Besson 1997), 1 min 25 sec.

FILM 6. The example shows decentered speech. The words are not understood but the emotional content is clear.

La Haine (Mathieu Kassovitz 1997), 30 sec.

FILM 7. The example shows cricket sounds that have an empathetic character. The crickets replace the violin "tremolo" that normally is used in similar scenes.

Children of a Lesser God (Randa Haines 1986), 1 min.

FILM 8. The example shows an empathetic sound. The running water does not transmit any feeling at all.

Psycho (Alfred Hitchcock 1960), 1 min 25 sec.

FILM 9. The two scenes exemplify the use of symbolic music. The themes (leitmotifs) are linked to the woman and to the dream about America. Observe the firm punctuation of the music (Mickey Mousing).

The Informer (John Ford 1935), 2 min and 2 min.

FILM 10. The example shows how ambient sounds can create environmental atmosphere and also be a part of the narration.

Once upon a Time in the West (Sergio Leone 1969), 4 min 50 sec.

FILM 11. The example shows a sound where speech is no longer dominating, a detailed, rich and thick ambient sound with many "REALITY LINKS".

McCabe and Mrs. Miller (Robert Altman 1971), 3 min 30 sec.

FILM 12. The example shows how interfoliating music and ambient sound can create a clear consistency in the sound. No "REALITY LINKS".

Mon Oncle, (Jacques Tati 1958), 2 min 10 sec.

FILM 13. The example shows sound editing with sound jump cuts both in the middle of a scene and in the cut between two scenes.

Prénom Carmen (Jean-Luc Godard 1983), 1 min.

FILM 14. The example shows a Kung Fu-fight. The sounds punctuate the movement. The synchronisation of image and sound rhythms creates a choreography that gives an aesthetic dimension. Firm punctuation. First half with sound, second half without.

Rumble in the Bronx (Stanley Tong 1997), 2 min 50 sec.

Film 15. The example shows the effect of synchronised scene cutting and sound rhythm. Firm punctuation.

Koyaanisqatsi (Godfred Reggio 1983), 1 min 45 sec.

FILM 16. The example shows when sound and sound changes are geared by internal logic.

On the Waterfront (Elia Kazan 1954), 1 min 20 sec.

FILM 17. The example shows when sound and sound changes are geared by external logic.

Alien (Ridley Scott 1979), 2 min 35 sec.

FILM 18. The example shows how the tempo in a scene can be changed by slow-motion and sliding tempo-changes. The sound supports the slow-motion feeling.

The Long Riders (Walter Hill 1980), 2 min 50 sec.

FILM 19. The example shows (one must imagine the THX technology) how the sound helps the audience to keep spatial orientation when following this speedy science fiction taxi.

The Fifth Element (Luc Besson 1997), 2 min.

Scheme for sound analysis .

A scheme must be **easy to understand and apply**. The interpretations of the **concepts** should be **clear**.

The analysis must be able to **discriminate between different styles** and the parameters identified must be **relevant**. There are no objective criteria for relevance. One has to look into film literature to see if all the questions debated there are covered by the scheme. For each part of the scheme there should exist a **distinct alternative** and these ought to be **of importance** to the film creator in his/her communication with the audience.

I think all these criteria for a good scheme are met sufficiently well.

The scheme consists of some methodical rules and a list of questions.

Methods.

- **Divide the film into suitable parts.**
- **Pick out typical parts with different character.**
- **Study sound and image separately.**
- **Use associative, sound describing words.**

Questions.

- 1. The three components, speech, music, ambient sound and sound effects viewed together. Are there any dominating tendencies? What are the proportions? Try to quantify the musical share.**

How is the consistency? Is mixing done with separation, interfoliation or combining soft and hard sound profiles?

2. Character of speech?
3. Character of music?
4. Character of ambient sound and sound effects?
5. Smooth editing/ jump cuts? More or less expressive editing?
6. Punctuation? What form? Frequency?
7. Temporal elasticity?
8. Spatial orientation? Any "locality links"?
9. Internal/external logic?
10. Reality Linked Sound Details ("reality links")? What type? Frequency?
11. Use of other audiovisual languages?

20 film analyses.

1. *The 39 Steps* (Alfred Hitchcock, 1935).
2. *Body and Soul* (Robert Rossen, 1947).
3. *The Hustler* (Robert Rossen, 1961).
4. *Merrill's Marauders* (Samuel Fuller, 1962).
5. *Cape Fear* (J Lee Thompson, 1962).
6. *Bullit* (Peter Yates, 1968).
7. *Night of the Living Dead* (George A Romero, 1968).
8. *The Sting* (George Roy Hill, 1973).
9. *Raging Bull* (Martin Scorsese, 1980).
10. *The Blues Brothers* (John Landis, 1980).
11. *Fitzcarraldo* (Werner Herzog, 1982).
12. *The Color of Money* (Martin Scorsese, 1986).
13. *Rocky* (John G Avildsen, 1976). *Rocky IV* (Sylvester Stallone, 1985).
14. *Runaway Train* (Andrej Konchalovsky, 1985).
15. *The Mission* (Roland Joffe, 1986).
16. *A Nightmare on Elm Street 3: Dream Worriers* (Chuck Russel, 1987).
17. *Cape Fear* (Martin Scorsese, 1991).
18. *Medicine Man* (John McTiernan, 1992).
19. *Scream* (Wes Craven, 1997).
20. *The Rock* (Michael Bay, 1997).

1. *The 39 Steps* (Alfred Hitchcock, 1935).

Sound components viewed together. Clear consistency is achieved through good mixing of speech or music with ambient sound. There is very little music, only 11% of the time and most of it has a hard profile and is never combined with speech.

Character of speech. Theatrical. Clear.

Character of music. Mostly Music Hall music. Diegetic music with two exceptions, when the protagonist is chased and when the girl understands the man is not a murderer. In these two cases it is empathetic music. Otherwise music is there for the atmosphere and because of the locality.

Character of ambient sound and sound effects. The train sounds are well defined, both outside and inside a compartment. It is interesting to note that it is no problem to mix train sounds on a realistic level with speech without interfoliation. All the sounds come out clear.

Editing. Soft editing. Not expressive.

Punctuation. No obvious punctuation.

Temporal elasticity. No slow-motion.

Spatial orientation. Sound is not used for orientation.

Internal/external logic. External logic.

Reality Linked Sound Details. A number of "reality links".

Use of other audiovisual languages. No.

2. *Body and Soul* (Robert Rossen, 1947).

Sound components viewed together. Clear consistency is achieved through matching a mix of speech and music and with standardised ambient sound and sound effects that never interfere with speech. In a few scenes the volume of the music makes it a slight strain to follow the speech. Music takes up 40 % of the time. There is no obvious interfoliation.

Character of speech. Theatrical. Clear.

Character of music. The theme "Body and Soul" is played throughout in different variations (even as waltz). All music is swing or jazz from the period i.e. music with hard profile in general. In the film the choice of instrument and the musical arrangements give a soft profile especially when combined with speech. The combination of music and speech works very well. Music is played at a relatively high level but most of the speech is still clear. All music is empathetic.

Character of ambient sound and sound effects. These sounds are few and of a standardised type. The punch sounds in the boxing match are very short and without development. No reverberation. They lack character. The shouting in the audience is more lively and interesting and that sound gets a greater share in the sound mix.

Editing. Soft editing. Not expressive.

Punctuation. The boxing scenes are not choreographed, but there is a pattern of punctuation in them.

Temporal elasticity. Music in combination with diffused images shows a shift in time.

Spatial orientation. Sound is not used for orientation. Off-screen space is not developed.

Internal/external logic. Music always follows an internal logic. Sound editing otherwise is geared by clarity of speech.

Reality Linked Sound Details. Very few "reality links".

Use of other audiovisual languages. No.

3. *The Hustler* (Robert Rossen, 1961).

Sound components viewed together. Clear consistency is achieved mainly by separation of the sounds. In some scenes with diegetic bar or restaurant music, short sentences are interfoliated between musical phrases, in others the music is played low with soft profile to make the speech heard. The music has in general a hard profile, difficult to combine with speech, but there are soft parts also. Music takes up 20% of the time. The ambient sound and sound effects play a great role. They always come out clear, often framed by silence.

Character of speech. Theatrical. Clear. Mostly without any other sounds.

Character of music. Music is relatively sparse. With a few exceptions it is jazz music from the period (around 1960). Besides some diegetic bar and restaurant music, most of it is non-diegetic. Music is used in transition between scenes or together with a double exposed image to mark transition in time. Music is always empathetic.

Character of ambient sound and sound effects. They are very important in the film. It is used for narration and to create atmosphere. Some relatively long scenes are built up around ambient sound framed by silence. All pool game sounds, ball clinks, scraping of feet, chair creaks, lighting matches, turning on/off the light and sounds related to the cues, choosing cue, chalking, different type of strikes etc are all well defined.

Editing. Soft editing. Not expressive.

Punctuation. The distinct markings of ambient sounds give a punctuation but it is never felt as choreographed.

Temporal elasticity. Scenes with a double exposed image and jazz music with elongated tones mark transition in time.

Spatial orientation. Sound is not used for orientation. Off-screen space is not used.

Internal/external logic. Internal logic.

Reality Linked Sound Details. There are a lot of well defined "reality links".

Use of other audiovisual languages. No.

4. *Merrill's Marauders* (Samuel Fuller, 1962).

Sound components viewed together. A war film set in Burmese jungles. Speech is always clear and is achieved by keeping the background sound low or if it is a combat situation by interfoliation. It is interesting to note that the war sounds and music, both with hard profiles are mixed in a way that destroys clarity. A little bit of music is heard, then there is gunfire then a little bit of music again. The music (mostly brass music) is more like a sound effect, the melody cannot be followed. There is music 70% of the time.

Character of speech. Theatrical. Clear.

Character of music. Mostly military brass music. Empathetic with the struggle.

Character of ambient sound and sound effects. The theme of the film is the hardship which the soldiers endure in a long walk through swampy jungle. One would expect a lot of sounds that could illustrate their sufferings, but there are very few jungle sounds, a few birds and a frog, that is all. The sounds are not well defined. The music accompanies their long walk as opposed to sound effects.

Editing. Smooth editing.

Punctuation. War sounds and music are not interfoliated and do not follow a punctuated rhythm. But when there is less noise the movements of the soldiers follow a rhythm that is punctuated by small sounds.

Temporal elasticity. No slow-motion.

Spatial orientation. Sound is not used for orientation.

Internal/external logic. External logic.

Reality Linked Sound Details. Not many "reality links".

Use of other audiovisual languages. No.

5. *Cape Fear* (J Lee Thompson, 1962).

Sound components viewed together. Clear consistency is achieved through separation. Speech is clear. Music is very important, and is played 50 % of the time, usually very intensely. Ambient sound and sound effects appear usually framed by silence. In some scenes in the swamp music, speech and ambient sound are interfoliated. Some short words are said inbetween musical phrases or together with soft profile music.

Character of speech. Theatrical. Clear.

Character of music. There are some scenes with diegetic bar music, the rest is non diegetic symphonic music. Suggestive forceful music. A typical pattern is a score with swift forceful disharmonies followed by long tones, very low or very high, in a chromatic pattern, followed by a period of complete silence or silence with just a few well defined ambient sounds, like breathing or creaking followed by disharmonic music again etc.

Character of ambient sound and sound effects. In town scenes these sounds were rare, just the conventional minimum. In the swamp scenes sounds are used more frequently for narration, to create tension, and to some extent to create atmosphere. The swamp sounds of frogs and insects are very general and not particularly defined.

Editing. Soft editing. Expressive editing of music but not of speech and ambient sound.

Punctuation. No obvious punctuation.

Temporal elasticity. No slow-motion.

Spatial orientation. No use of sound for that. The off-screen space was never defined by sound.

Internal/external logic. The music and the sound volume primarily reflect the situation not internal feelings, therefore it is external logic.

Reality Linked Sound Details. With emotional music pouring over you there is little room and need for "reality links". But in some moments of silence in between there are some ambient sounds with "reality link"- character.

Use of other audiovisual languages. No.

6. Bullit (Peter Yates 1968).

Sound components viewed together. Clear consistency is achieved through separation. Music plays only 17% of the time.

Character of speech. Theatrical. Clear.

Character of music. Jazz music from the period. Music is diegetic in bars and restaurants. "West coast Jazz" with flute in the restaurant puts the place on the geographical map. Non-diegetic music appears in the beginning and end of the film and besides that only in a few other scenes. The car-chase scene is long, and the first third is accompanied by music. In some scenes there are changes of view from one place to another and music is used to bridge these transitions. Music creates an atmosphere but is not used empathetically or otherwise in the story itself.

Character of ambient sound and sound effects. The ambient sound is used in a standard way; big sounds and those that are of narrative importance are all in place. No original character of the sound. The sound of doors in lifts, glasses being put down, opening and closing of car doors, car-break sounds all seemingly taken out of a studio's "sound library". The film is famous for the car-chase scenes and some sound quality was therefore to be expected there. The two cars have different sounds and they were probably correct in relation to the two models, but the sound was never developed or used for something interesting.

Editing. Soft editing.

Punctuation. The car chasing scenes are punctuated. Many of the scenes with no other sound than ambient sound are punctuated. Standard ambient sounds invite punctuation.

Temporal elasticity. No slow-motion.

Spatial orientation. Sound was not used for orientation.

Internal/external logic. External logic.

Reality Linked Sound Details. Few "reality links".

Use of other audiovisual languages. No.

7. Night of the Living Dead (George A Romero, 1968).

Sound components viewed together. Clear consistency is achieved through separation. Music takes up 45% of the time. Most of it is dominant with no other sound. In some scenes speech is combined with music at a very low level. Sometimes music is combined with effect sounds.

Character of speech. Theatrical. Clear.

Character of music. Horror music of different kind most of the time. Most frequent is a fading, wowing and fluttering type of interference in slow symphonic music. Another is incessant repetition of a simple

sequence of four tones. Others are a low tone combined with very high dissonant tones. In a few scenes there is music that expresses sympathy and togetherness. All music is non diegetic.

Character of ambient sound and sound effects. Very distinct horror effects. Loud and hard striking tones when it is meant to surprise (the hand or the face of a zombie close by) and lower grunting and animal related sounds when it is meant to give a creeping feeling (a lot of zombies are coming closer). The sound are effective but not very well defined.

Editing. Smooth editing. The music is expressive but the editing of the diegetic world is not expressive.

Punctuation. Nothing obvious. The movement of the zombies are not punctuated.

Temporal elasticity. No.

Spatial orientation. Sound is not used for orientation.

Internal/external logic. External logic.

Reality Linked Sound Details. It is a low budget film with rather rough sound recording which gives a feeling of realism. Music takes a lead and there is no room for "reality links".

Use of other audiovisual languages. TV is important, and it appears frequently.

8. *The Sting* (George Roy Hill, 1973).

Sound components viewed together. Clear consistency is achieved through separation, interfoliation and good mixing of speech and ambient sound. Music takes up just under 15% of the time. Scott Joplin's music is never mixed with speech. Other music with a soft profile is used in a few scenes when mixed with speech. Ambient sound is usually framed by silence.

Character of speech. Theatrical. Clear.

Character of music. The film is separated into acts and every act is introduced with Scott Joplin music. This music gives the film its basic character and atmosphere. It is also used in some transitional scenes. Otherwise music is sparsely used. Soft non diegetic empathetic music appears in connection with a tragic death. Diegetic music comes from the merry-go-round and it is also heard in a restaurant.

Character of ambient sound and sound effects. Clear and well defined. Used for narration. Supports movement, comings and goings in doors and stairs. Sounds on the train are well defined. There is a clear difference between corridor and compartment. The train sounds are kept on a realistic level when combined with speech, without disturbing the clarity of the speech.

Editing. Soft editing. Not expressive.

Punctuation. Movement is punctuated with ambient sounds, and in some scenes also with music. In some cases the music is used to choreograph scenes.

Temporal elasticity. The music between acts helps accentuate the shifts in time.

Spatial orientation. The merry-go-round sound that is heard at a very low level in the other rooms, keeps an off-screen space alive.

Internal/external logic. External logic.

Reality Linked Sound Details. There are a number of "reality links" but not that create realism and nearness. The film has an ironic tone and is made to be viewed with some distance.

Use of other audiovisual languages. No.

9. *Raging Bull* (Martin Scorsese, 1980).

Sound components viewed together. Clear consistency. Music takes up 35% of the time, but half of that time it is at a very low background level and sometimes difficult to hear at all; it comes and goes. All three sound components appear simultaneously well mixed. There is mostly low level music combined with speech.

Character of speech. Theatrical. Clear.

Character of music. Popular music from the period (the forties and fifties); some Frank Sinatra songs from the fifties. Most of the time it is diegetic and it helps to build up the atmosphere in the home, the neighbourhood, at the restaurant and at the night-club. There is also a lot of extra-diegetic music, but also some symphonic music. The music is mostly empathetic. In one quarrelling scene ironic music (a sentimental love song) is used.

Character of ambient sound and sound effects. Good boxing sounds. The sound has a clear development, a howling sound before the hit, the hit sound and then some reverberations. The sounds are varied. Other ambient sound and sound effects are very well defined and well used. The music never kills the ambient sounds.

Editing. Soft editing. The boxing sounds and the non diegetic music is expressive but not the other sounds.

Punctuation. Some of the boxing scenes are punctuated in a rhythmic way.

Temporal elasticity. There are several slow-motion scenes, and in the boxing scenes the sound is also affected.

Spatial orientation. Sound is not used for orientation.

Internal/external logic. Internal logic

Reality Linked Sound Details. Many "reality links", frequently used.

Use of other audiovisual languages. TV is used shortly in some scenes.

10. *The Blues Brothers* (John Landis, 1980).

Sound components viewed together. Clear consistency. Music is very important in this film. It takes up about 55% of the time and is dominant most of that time. Music is combined with ambient sound or speech which is then interfoliated in a smooth way. In the car-chase scenes where ambient sounds are combined with music, both are clear. The rest are mostly scenes with heavily marked ambient sound or speech against a background of silence.

Character of speech. Theatrical. Clear.

Character of music. Mostly Rhythm & Blues, which is the theme of the film. This music is empathetic. Country music and opera music are used ironically. Most music is non-diegetic. It's used diegetic when Ray Charles plays and twice when the band plays. There are also some scenes with extra-diegetic "Blues Brother music".

Character of ambient sound and sound effects. The film starts with a long sequence without music and there the ambient sound is used in the narration and to create atmosphere. These sounds have a structured development and are well defined. When music is played in a dominating way the ambient sounds are subordinated. One exception to this is the various car-chase scenes where music and ambient sound are well matched. It's the screeching of the rubber tyres that is the major car sound. It's a well defined sound and it has a structured development into higher frequencies. The other car sounds, the sirens and the many crashes are more stereotypical.

Editing. Smooth editing. The editing is expressive, realism is never a interesting goal.

Punctuation. When the music dominates all the movements are rhythmically punctuated. Also when the ambient sounds gear the narration the movements appear choreographed.

Temporal elasticity. No.

Spatial orientation. Sound is not used for orientation.

Internal/external logic. External logic.

Reality Linked Sound Details. Very few.

Use of other audiovisual languages. No.

11. *Fitzcarraldo* (Werner Herzog, 1982).

Sound components viewed together. The story is located on the Amazon river and its shores. Ambient sound is very important in this film. Speech is not dominant, it's the image that drives the action forward. Music has a central role. It dominates at the start and end but there are long sequences in the middle without music, where ambient sounds from the jungle take over. Music takes up just under 30% of the time. All sounds are very clear and distinct. There is very little overlapping. All sounds come out individually.

Character of music. Music is mainly diegetic and always empathetic. Fitzcarraldo's horn gramophone playing opera music has a central role in the film. It becomes a symbol (in some cases provoking) for his project to build an opera in Iquitos and for his character as the dreamer with impossible projects. In the jungle it becomes a symbol of culture and civilisation ("opera is our emotions outermost expressions" and "this God don't come with guns but with Caruso"). It is used to impress and disarm the jivaro Indians. He uses it to entertain his audience, the children on the beach ("Laugh Pajazzo" makes a great success). Other important diegetic music is the children's music to get Fitzcarraldo out of jail and jivaros music with pan flute, singing and drumming.

Non-diegetic music appears in 8-10 places which is relatively little in a 150 minute film. The choral music creates a fateful mood, symphonic music is used in some transitional scenes (panning) and folk music creates a feeling of optimism and belief in the future.

Character of speech. The protagonists language is normal theatrical speech. There are no narrators or invisible characters. Jivaros speech is unintelligible. In excited situations it changes into chatter. In some work scenes there is decentered speech.

Character of ambient sound and sound effects. The environment is strengthened and made more precise by the ambient sounds. The sound in the jungle is different if it's morning, day, evening or night. The sounds tell the distance to the beach and the distance to the cataracts. The work to drag the boat over the mountain is accompanied by a lot of sounds. The life on the beach in Iquitos has also a rich sound palette.

There are many ambient sounds which have a narrative function, that lie in the area between diegetic and non-diegetic. The presence of jivaros are marked by drums. The more there are and the closer they come the higher the volume. That sound is not realistic in volume and location. Then comes a flute sound imitating birds. All this is perceived as jungle sounds. Herzog often uses silence as an element to create tension. After the many lively sounds, the silence stand out as very menacing.

Editing. Smooth editing. Sound editing is very expressive both with diegetic music and the ambient sounds.

Punctuation. The tempo in the film is relatively slow. There is no punctuation that is directly visible.

Temporal elasticity. There are no slow motion scenes or other direct visible methods to influence the tempo.

Spatial orientation. The many ambient sounds create off-screen space the whole time. It is passive off-screen sound, as soon as something needs attention the camera is already pointing in that direction.

Internal/external logic. The sound editing is geared by external logic.

Reality Linked Sound Details. There are a lot of "reality links" and the total effect of that is substantial reality feeling. The individual sounds are not particularly defined.

Use of other audiovisual languages. No.

12. *The Color of Money* (Martin Scorsese, 1986).

Sound components viewed together. There is seldom silence, there is always some sound. There is a constant interplay between speech, music and ambient sounds. All of them have room, but the volumes are continuously adjusted to speech that always comes out clear and distinct. Music takes up 65% of the time.

Character of speech. Theatrical. Clear. The film starts with a narrator (Martin Scorsese). Otherwise there are no narrators or invisible characters. Speech is not decentered.

Character of music. The film takes place in bars and poolrooms and most of the music reflects jukebox, rock'n roll, "black" and swing of that time. Many have a diegetic base, but they are often used extra-diegetic. The music can follow people into new scene, for instance outdoors. Most of the music is popular and has connotations to the atmosphere. Some of the musical score is original (Robbie Robertson) composed for special scenes, for instance the opening scene. The music is empathetic throughout. A large part of the time there is a musical background that develops the spatial feeling. The music is often made of deep, dark tones and sometimes it's difficult to identify a tune.

Character of ambient sound and sound effects. The music creates the atmosphere. To that is added a variety of smaller sounds that create presence. The special clink from billiard balls are there all the time. Some other sounds are easy to identify like glasses chinking but there are also some low humming sounds which in an unnoticeable way create a background sound without you knowing what it is.

Editing. Smooth editing, transition from one scene to next is bridged over with music. There is very clear expressive editing of the music. Other sound editing is also expressive, but well within what is understood as realistic sound.

Punctuation. The pool game scenes have a very distinct punctuation. Also in other scenes there are punctuated image- sound patterns but they are looser.

Temporal elasticity. There are no slow motion scenes and no other technique that affects the tempo.

Spatial orientation. The music develops off-screen space. This is especially clear in the store room behind the bar. The music denotes the other room and you are aware of what is happening there. In the pool room it's the sound of the billiard balls combined with music which fills the off-screen space. A sequence often starts with a limited visual field but is filled with a lot of off-screen sounds, then the scene gradually widens. The off-screen sounds are mostly passive. In some scenes there are active off-screen sounds, something has happened, a tension builds up which is stretched out over some seconds. It takes some time before we are allowed to see it.

Internal/external logic. The sound is geared by internal logic. The volume goes up or down depending on the protagonist's emotions. Sometimes music is played which corresponds to internal emotions.

Reality Linked Sound Details. There are a lot of well defined details, glass chinks, pouring sounds, clink of billiard balls, breathing sounds etc.

Use of other audiovisual languages. No.

13. *Rocky* (John G Avildsen, 1976). *Rocky IV* (Sylvester Stallone, 1985).

The final boxing scenes (*Rocky* 9 min, *Rocky IV* 17 min).

There is a basic difference between the two films. *Rocky* is a fight between two sympathetic boxers, where the local boy viewed as underdog is the favourite. There seems to be a strive for realism with a romantic undertone. In *Rocky IV* it's a fight between good and bad, between USA and the Soviet Union, between a free man Rocky and a disciplined machine like broiler Drago. The scene is a political caricature of the Soviet Union and has very little realism.

Both scenes have the same structure. It's in the beginning, the first two, three rounds and in the final round where the drama takes place. The middle part (*Rocky* 3 min, *Rocky IV* 4,5 min) is a cavalcade of excerpts bound together with music and number cards indicating the rounds.

The sound at the beginning and end is a mix of public reaction, loudspeaker announcements and sounds from the boxing. The consistency is clear, all sounds are well defined.

Character of speech. Theatrical. In *Rocky* the loudspeaker sound is distorted in a realistic way. In *Rocky IV* it has a hard unfriendly character.

Character of music. In *Rocky* it's friendly cheerful music. In *Rocky IV* it's military music with hard metallic tone.

Character of ambient sound and sound effects. In *Rocky* the boxing sound is developed in the same direction that is later going to be noticed in *Raging Bull*, but not as far or as detailed and as varied as in that film. It's a constructed sound far away from a direct recorded sound. The punch sound has a whining and sometimes a groaning in the beginning to mark that the hand is swift and the willpower behind it is strong and there is an echo effect after to indicate that the hit was hard. In *Rocky IV* it's a similar sound but the initial whining is a bit longer and more accentuated, there is no groaning and the echo effect is shorter which indicates the swiftness and power of the blow is extreme, almost inhuman.

14. *Runaway Train* (Andrej Konchalovsky, 1985).

Sound components viewed together. Clear consistency, achieved through distinct and almost complete separation. One thing at a time, all geared by narration, detailed realism is not needed. All sounds are clear. The strong feelings between the protagonists are communicated through the speech, which is dominant. The other sounds are complementary. Ambient sounds are used sparsely and usually to develop the narrative. Music plays just under 15% of the film's duration.

Character of speech. Theatrical. Clear.

Character of music. With the exception of some minutes of digital music in the jail's loudspeaker and some harmonica music at the boxing match all music is non diegetic. All together it's about 15 minutes of specially composed non diegetic music. This music begins about 20 minutes after the film starts when the train the protagonists are going to catch is seen. It is heard here and there on a low level during the rest of the film until the final 20 minutes. In those last minutes it plays an important role. Long "cutting" sounds, mostly instrumental but sometimes vocal emphasises the fateful destiny of the train.

Character of ambient sound and sound effects. Very defined sound. Hard metallic railway sounds. Used sparsely usually to develop narrative or for effects and not to create atmosphere.

Editing. Smooth and expressive editing.

Punctuation. No obvious punctuation.

Temporal elasticity. No slow-motion.

Spatial orientation. Focus is always on two or three people and their relationship. Orientation is never a problem, off-screen space is never used for any dramatic purposes.

Internal/external logic. Internal logic gears changes in sound.

Reality Linked Sound Details. Very few "reality links". There is no need for that. It's the willpower of the protagonists which constitutes the scene.

Use of other audiovisual languages. Short TV interview with the warden.

15. *The Mission* (Roland Joffe, 1986).

Sound components viewed together. Clear consistency by good mixing of all sound components. There are several parts with speech, music and ambient sound mixed together, and all of them are very clear. Music is just under 50% of the time. It's very important for the emotional impact of the film. Music is often very low. Long dark tones in the borderline music/effect sounds.

Character of speech. Theatrical. Clear. The Indian speech is unintelligible but has a clear emotional message.

Character of music. Symphonic music, often with pan flute to give an "Indian" character. Empathetic music.

Character of ambient sound and sound effects. Surprisingly little of "jungle sounds". Music takes over when the camera is moving through the jungle. The ambient sounds come from the Indians and their activities and not the surroundings. When ambient sounds break through they are well defined.

Editing. Soft editing. Not expressive.

Punctuation. The music often punctuates movement, for example, climbing the rocks close to the waterfall.

Temporal elasticity. No obvious effect.

Spatial orientation. Sound is not used for orientation.

Internal/external logic. Internal logic. When sound of water falling is replaced by symphonic music its for internal reasons.

Reality Linked Sound Details. Not many. The music dominates; there is little room for "reality links".

Use of other audiovisual languages. No.

16. *A Nightmare on Elm Street 3: Dream Warriors*, (Chuck Russel, 1987).

Sound components viewed together. Clear consistency. All three sound components appear simultaneously but mixed in a way that all come out clear. Music and sound effects work together as one unit and do not come into conflict. Short sentences and screams are interfoliated when music has a high volume. When longer dialogues are combined with music and sound effects it is soft profile music and the sound effects are interfoliated. Basically the film sound follows a three part structure that is repeated several times. First a period which on the surface appear normal, but strange background sounds or music that are slightly twisted indicate that something is about to happen. Then the horror part comes in full blast with a lot of music and effect sounds. The third part is a period of recovery from the previous emotional and very strenuous experience; mostly dialogue between friends against silence. Music is important all the time and it is intertwined with sound effects. Music takes up just under 40% of the time.

Character of speech. Theatrical. Clear.

Character of music. With a few exceptions it's non diegetic music. It's very varied, changing all the time, adapting to the situation. There is nothing of "fading sounds" which are common in the earlier horror films. The music has a synthetic sound. Mostly it's a combination of very high tones, the more pure "Celeste" type or hard cutting tones and very low tones. It's modern music with broken up rhythms (random elements). The integration of sound effects into the music is striking.

Character of ambient sound and sound effects. Ambient sound is well represented in this film but it's the sound effects which really matters. Some of the sound effects, especially those on high volume which are meant to create shock have a synthetic character. But there are also a lot of sounds with a character that relate it sometimes in a distorted way, to specific things or activities for example violent fire, falling glass splinters, ropes that are almost worn through, creaking wooden structures that might fall down, jet beams, hysterical laughter, screams, dog barks, sounds coming from a tunnel, distorted voices, howling, bells, banging on a tube etc.

Editing. Soft editing.

Punctuation. There is a lot of movement which is punctuated by sound effects.

Temporal elasticity. There are some slow-motion sequences which indicate dreaming which the Celeste type of music supports.

Spatial orientation. In the horror sequences sound helps orientation.

Internal/external logic. External logic

Reality Linked Sound Details. There are a number of "reality links". They are of importance in the scenes where normality is restored.

Use of other audiovisual languages. TV has an important role in one scene.

17. *Cape Fear* (Martin Scorsese, 1991)

Sound components viewed together. Speech, music and ambient sound can appear simultaneously. Clear consistency is achieved by control of volume. Interfoliation techniques are used but not in a hard way, overlapping create continuation. Music takes up 50% of the time. It dominates in some sequences but usually on low volume.

Character of speech. Theatrical. Mostly clear but often combined with soft profile quiet music.

Whispering, speech with toothbrush in the mouth is not clear, but not because other sounds disturb.

Character of music. Symphonic music. A tune consisting of four down moving tones is repeated many times with some variations. The volume is not used to create shock effects. Music is designed to create anxiety of that which is going to happen. This feeling is conveyed through lightly irritating music at low volume.

Character of ambient sound and sound effects. These are not of major importance. They are not used in narration or to create shocks. The sounds are well defined.

Editing. Soft editing. Not expressive.

Punctuation. No obvious punctuation.

Temporal elasticity. Slow-motion scenes at the make-up table indicate that the protagonist is dreaming or memorising. Music is different there.

Spatial orientation. Sound is not used for orientation. Off-screen space is not developed.

Internal/external logic. It's external logic except for the scenes when husband and wife are quarrelling.

Reality Linked Sound Details. There are many "reality links" related to speech and to ambient sound.

Use of other audiovisual languages. When the daughter in the house is looking at a music video.

18. *Medicine Man* (John McTiernan, 1992).

Sound components viewed together. All three sound components appear simultaneously. Clear consistency is achieved through good mixing, loud music has a soft profile when combined with speech and it has a hard profile it is at low volume. There are some short ambient sounds with a hard profile together with speech. Being short they do not interfere with the intelligibility of speech. More dominant ambient sounds usually have a background of silence or music consisting of long tones without any melody. The sound has a broad range with very high and very low tones clearly reproduced. The music takes up about 50% of the time.

Character of speech. Theatrical. Clear. Indian speech is unintelligible but the emotion is understood.

Character of music. Symphonic music. Much consists of long deep tones played at low volume, sometimes difficult to hear. It fluctuates.

Character of ambient sound and sound effects. Most of the ambient sound is related to the action of the protagonists and the Indians. All those sounds are well defined. A lot of time is spent showing the beauty of the jungle, both by panning and going into detail, but the image is usually accompanied by symphonic music. There are very few actual jungle sounds but the ones reproduced are well defined and have a structured development. The reproduction of high tones are of great help there.

Editing. Soft editing. Unexpressive.

Punctuation. No obvious punctuation.

Temporal elasticity. No.

Spatial orientation. Sound is not used in orientation.

Internal/external logic. Internal logic.

Reality Linked Sound Details. Not many "reality links".

Use of other audiovisual languages. No.

19. *Scream* (Wes Craven, 1997).

Sound components viewed together. Clear consistency. Music is either at a very low level for background and atmosphere or at a very high level to create horror effects. Music takes up 65% of the time. The ambient sounds are few but very distinct, they always break through. Speech is mostly combined with music or musical sounds at low level.

Character of speech. Theatrical .Clear.

Character of music. A horror film but there is no stereotypical horror music, with chromatic scales, fading music etc. Music fulfils different functions, and the music differs accordingly. To create a creeping feeling that something is wrong low volume fragmented music is used with different short musical phrases, which are instantly adapted to the situation. It's usually a combination of very long low, often diffuse tones which are combined with very high clear tones, sometimes vocal. It often a little bit dissonant, and glissandi appear now and then. Percussion instruments often mark that something is happening. For the horror sound kettle-drums are mostly used, combined with different synthetically created after sounds. The drum sounds often come after some moment of silence and it come suddenly and hard. Guitar music often with a vocalist or disco music is used to calm down the situation for a while and create confidence between friends,.

Character of ambient sound and sound effects. Musical instruments are used to create horror effects, and to that is added some synthetically created sounds, not far from instrument sounds. There are no

deformed "real life sounds", that are used in many horror films. There is dog barking now and then, but it's realistic sounds when there are dogs in the area.

Editing. Soft editing. The non diegetic sound (horror music and sound effects) are very expressive. In the horror scenes the edited sound is very expressive; in other "normal" scenes to a less degree, but still expressive. Telephone sounds are for instance unrealistically loud, and the reason is obvious, it could be the murderer calling.

Punctuation. Movement and horror music and sound effects are punctuated.

Temporal elasticity. No slow-motion.

Spatial orientation. Sound is not used for orientation

Internal/external logic. In scenes where the protagonist is scared there is no difference between internal and external logic, but there are some scenes where she does not know the fear, and there it's the external situation that gears the sound editing.

Reality Linked Sound Details. Horror music and horror sound effects dominate. There is very little room for "reality links" and there are also very few.

Use of other audiovisual languages. A TV news reporter plays a role in the story and both TV programs and the recording of program are shown in the film.

20. *The Rock* (Michael Bay, 1997)

Sound components viewed together. Clear consistency is achieved through good mixing. Music takes up 70% of the total time, which is a lot, but it never interferes with speech, short sentences are interfoliated for longer dialogue the volume is adjusted. It is an action film with a lot of effect sounds.

Character of speech. Theatrical. Clear.

Character of music. Symphonic music. Empathetic.

Character of ambient sound and sound effects. There is a 5 minutes long car chase. The theme is all the cars crashing and the tram that jumps of its rails. The sound is built up of crash sounds and music most of the time and a little bit of engine and break sounds. The ambient sound in the film are not interesting, everything is embedded in music. The sound effects are very traditional, shots and explosions.

Editing. Soft editing

Punctuation. Movements are punctuated and sometimes interfoliation creates a rhythm.

Temporal elasticity. In explosion and crash scenes slow-motion is used but the sound is not adjusted to the image.

Spatial orientation. Sound is not used for orientation.

Internal/external logic. External logic.

Reality Linked Sound Details. Few "reality links".

Use of other audiovisual languages. No

Comments on the themes.

Boxing. In direct recorded boxing the punch sounds short and without much life. There is no sound leading up to the hit and there are no echoes or other "after sounds". That is very much the character of the sound in *Body and Soul* (1947). It was the spectators' aural reactions and the music which gave life to the boxing scenes in that film. Since then the boxing sound has changed a lot. It is now usually totally constructed; the punch sound whines and groans in the beginning to mark the swiftness of the movement and the effort behind it. Echo effects after indicate that the hit was hard. This is the basic structure of the sound in *Raging Bull*(1980) and in *Rocky*(1976) and *RockyIV* (1985). It is this artificially constructed sound that is understood as realistic sound in boxing films today.

It is interesting to note that this developed sound opens up more individual variation. The boxing sounds in the three films mentioned are constructed differently depending on the relationship between the combatants.

Car chase. A comparison of the car-chase scenes in *Bullit* (1968) and *The Blues Brothers* (1980) show that the sound of screeching rubber tyres has developed a lot. In *The Blues Brothers* the sound has a defined development as the car goes through a curve and the final stage has a lot of high frequency sounds. In *Bullit* the engine sound dominated. It was a way to differentiate the two cars in the chase, but the sound itself was rather monotonous. That the tyre sound have taken over is very understandable; they are more dynamic and better express the feeling that the cars are pushed to their limits.

In *The Rock* (1997) it is the crash sound that dominates. That is also a sound with a clear characteristic and a defined development.

Jungle. Of the four films studied, three of them, *Fitzcarraldo* (1982), *The Mission*, (1986) and *Medicine Man* (1992) take place in the Amazon jungle. The confrontation between civilisation and native Indians is a major theme. The focus is not on the jungle itself but it constitutes an important surrounding. The fourth film, *Merrill's Marauders* (1962), is a war film which takes place in Burma's jungles. The film's theme is a long and strenuous walk through swampy jungle.

From nature and wild life documentaries it is well known that the jungle is full of interesting sounds. This potential is not used in any of these films except for some parts of *Fitzcarraldo*. The jungle is generally presented accompanied by symphonic music which sometimes imitates jungle sounds such as birdsong. There are some well defined jungle sounds in the films but they are used sparsely. Distinct ambient sounds are related to the activity of people, white men, Indians and in the war film soldiers of different nationalities. The ambient sounds from the jungle are very diffuse sounds of general character or music at a low level.

Pool room, pool game. The pool sounds, chalking a cue, a stroke on a billiard ball, balls bouncing against the sides, clinking sounds when balls are hit are all easy recognisable. They are short, precise and they create a rhythm. These sounds could be reproduced with the early sound systems without losing their character. Introduction of Dolby has not widened the sound and there seems to be little need to artificially develop the sound. The pool sound does not differ so much between *Body and Soul* (1947), *The Hustler* (1961) and *Color of Money* (1986), but the general atmosphere in the pool room has changed. One can notice a development from scenes with little music, very pointed ambient sound against a background of silence, limited attention to the off-screen space sound to scenes with almost constant background sound, often low level music, a mass of small ambient sounds, most of minor importance and a constant awareness of the off-screen space. It's a development towards a greater number of well defined sounds, more "reality links", less stereotypical sounds and also less punctuation.

Train . Train sounds are easily recognisable. Hearing a train from outside; inside a compartment; in the corridor; with open or closed window; the starting sound; the braking sound, all have specific characters. Train sounds were well reproduced in the early optical system. Dolby opened up the opportunity for additional sound but did not really change the old ones very much. In *Runaway Train* (1985) there are some hard metallic sounds that would have been difficult to reproduce in the old system. There is a difference in sound quality between *The 39 Steps* (1935) , *The Sting* (1973) and *Runaway Train* (1985) but the general train sounds are very much the same.

Characteristic sound differences more or less invite use for spatial orientation on the train. It is used in this way in *The 39 Steps* and *The Sting* creating an awareness of the existence of the corridor; whether the door to it is open or not and whether the window is open or not.

Train sounds have a soft profile and is possible to mix on a realistic level with speech. *The 39 Steps* is a good example of that. It is interesting to note that in *Runaway Train* it is not used. The dialogue there is so important that all other sounds are suppressed.

Horror. Psychotic killer. There are two clear trends in the development of horror sound. The first one is a shift from standardised horror or tension creating music (swift disharmonic violin music, fading music of symphonic type, chromatic scales, incessant repetition of a few tones) to music with more variation. It is music that adapts to new situations instantly; short musical phrases of totally different types; seldom a melody, just musical expressions.

The second trend is the development of new sound effects and their integration into the music. Many sound effects were and are produced by musical instruments. Now there is a greater variety many sound effects are recorded from real life. They are often deformed and sound a little bit strange but are still recognisable. They usually carry a connotation to something threatening or evil; a violent fire; a baby crying; a dog howling; insect sounds; constructions falling down etc. The difference between that type of sound effect and music is often erased and they operate intertwined.

Horror films are distanced from reality and can therefore use sound in a very free and expressionistic way. The psychotic killer films use similar sound elements as horror films to create tension, but usually the intention is to be viewed as closer to real life. In the use of tension creating sound they seem to be closer to the traditional style.

The **result** shows that the parameters in the scheme functions. Style differences between films are made clear. The results are consistent with the story which sound technicians tell. It also seems possible to draw some preliminary conclusions from a thematic approach of this kind.

The historical development of film sound; a sketch

This sketch consists of 17 points which mark some important features in film sound development.

1. The first years after the introduction of sound a major problem was the elimination of unwanted sounds and the balancing of the volume of different sounds. By 1932, five years after the introduction of the sound film, most of the initial problems had been overcome. Directional microphones had been developed. It was possible to make multi-track sound recordings which were then mixed into a single track. There was good synchronisation of sound and image. The optical recording system with the sound track printed on the filmstrip was robust and worked well.

2. In contrast to what many influential people in the film industry has predicted, the introduction of sound triggered off a great demand for "talkies". It is interesting to note the success of "quick talkies" with "machine gun dialogue".⁵⁰

3. Some filmmakers with a sceptical view of talkies developed instead the use of music and effect sounds and their interplay with the image. Chaplin was one of those. He developed a sound style with very distinct and expressive punctuation.

4. The technical limitations in the beginning had great effect on sound design. It was difficult to get "life" in many of the ambient sound and sound effects and therefore they were often left out. Most American films had, until the early sixties, few ambient sound and sound effects and those which did exist were very short markings often without any depth and life. In a "western" movie there were perhaps gun shots, door bangs, footsteps, horse sounds, whiskey glass chinks, smacks and knocks from fighting scenes and that is all. The sounds worked generally well as narrative elements, to show that something was happening but they seldom had an independent identity which helped develop the surrounding.⁵¹

5. It was music which was given the role of creating mood and atmosphere. To the diegetic score was added a "symphonic score" with long musical sequences in combination to action and dialogue. Many composers began to create special film music to increase the mood of romance and thrill. Music with well known "connotations" was put into the score. "Leitmotiv music" linked to a particular person or situation or theme was used. The music was mostly aimed at supporting the narration and was not meant to be noticed in itself. Musical effects that imitated and illustrated the ambient sound were added. The sound of walking and climbing stairs was often illustrated by synchronised music.

6. Jacques Tati, Robert Bresson and some others chose an alternative route. They made films with very little or no music. Instead they exposed the ambient sound and sound effects, often framed by silence. Within the frequency range they had at their disposal they managed by punctuation and other means to create interesting sounds with life. Bresson, who saw sound not as a complement but as a substitute to image, succeeded in creating detailed off-screen space from using sound elements.

Even early films tried to insert reality linked sound details ("reality links"). Through these details the audience perceives the film as close to reality. Other films have few or no "reality links" and they

⁵⁰ The dialogue could for acoustic reasons not be that speedy in the theatre stage. Cinema had here a comparative advantage that was used.

convey a feeling of theatre. For instance Robert Bresson often uses "reality links" in his films while Jacques Tati refrained from them.⁵²

7. One of the early problems in sound reproduction was the point of audition and distance to the sound. Should one match the deep focus of the image in sound? Should one shift sound perspective every time there was a cut in the image? Could you have cuts in the middle of a monologue? After a period of trials in different directions a dominant convention developed. You should not try to make the camera the point of audition and try to match the sound with "correct" microphone positions, but instead try to produce continuous soundtracks with approximately the same volume and same distance to the microphone for all characters involved, independent of where they are standing. In that way a uniform sound perspective was achieved. All demands for spatial realism were dropped in favour of narrative clarity. Sound became an important (maybe the most important) continuity factor in the film narrative.⁵³

8. The new technique of mixing separate tracks allows sound to become a means of artistic expression. If one sound component is isolated from another it allows for deliberate volume and tempo changes or distortions. Such new methods were quickly tried. *Citizen Kane* (Orson Welles 1941) has been characterised as the first modern sound movie. Welles with his experience from radio theatre succeeded in creating a strong impression of three dimensional sound without using stereo technique. He varied the quality (volume, clarity, tone and reverberation) so that it reflected distance and atmosphere. He put in overlapping dialogue, broken off sentences and sudden disruptions. All such things which are common in daily conversation and as such can be perceived by a sensitive person listening to what he has to and wants to hear.

It is interesting to note that at the same time as Welles introduced the depth dimension in sound he used it to disorientate and confuse the audience. He sometimes combined close up images with distant sounds and vice versa. This method is used to disorientate and create ambiguity which Welles continued to use in later films.

9. Sound quality improved gradually during the thirties and the forties, but the fundamental system of optical recording and printing technology remained the same. With magnetic recording technology, which broke through around 1950-51, film sound systems took a leap forward. Magnetic recording meant better fidelity, better dynamic, no loss of quality in mixing and easier mixing. The most

⁵¹ Train and pool game sounds are two example of the opposite where it actually did work well.

⁵² Chion, Michel, *Audiovision: Sound on Screen* p. 114-116.

⁵³ Altman, Rick "Sound Space." Altman Rick (ed) *Sound Theory/ Sound Practice*, (New York: AFI readers, Routledge 1992) page 46-64 and also Maasö Arnte, *Lydkonvensjoner i lydfilmen*.

fundamental advantage was the chance to record each sound separately and then mix the sound together and balance it in a controlled way.

In early sound films the sound was to be linked to the image and the camera. Now the sound could be treated more independently. Dialogue could be added easily afterwards and different sounds could be inserted. It gave more freedom for sound track but was more artificial and distanced from "true" direct sound.

10. Another technical step was made when magnetic sound started to be used in the reproduction of sound in the years 1952-53. Magnetic sound on film coincided with the introduction of CinemaScope and Cinerama. The sound existed in 4-6 channels and had a wide frequency range, which meant excellent sound quality. For predominantly economic reasons (the theatre owners did not want to invest in the new equipment needed) magnetic sound on film was not a big success. After some time most film producers returned to mono and optical sound.

Early stereo films were focused on demonstrating the directional effects and used many active off-screen sounds (the "look there" effect). Nowadays off-screen sound is used more for ambient sound and sound effects to build up the off-screen space in other (passive) ways. Passive off-screen sound gives increased separability in the sound.⁵⁴

11. The new technology with light magnetic sound recorders synchronised by a wire or radio with the camera was used in Hollywood to make sound more independent. Mobile equipment was easy to use everywhere and the French "Cinema verité" could fulfil their ideas of direct sound, which meant a very close connection between sound and image.

Jean-Luc Godard, and others from the French New wave, soon abandoned Hollywood's characteristic directional microphones and selective amplification in favour of the direct recording of all ambient sounds by means of a single omnidirectional centrally located microphone. It foregrounded the constructed nature of sound practices in studio-produced classical narrative film world-wide.

Direct sound ideology also affected editing. In strict direct sound a change of scene also means a cut in sound. Jump cut editing occurs in many of Godard's films.

12. Robert Altman used other means to come closer to reality in sound. He experimented with a multiple-channel recording system using eight or more different recordings. By mixing them he could, in

a very controlled way, put layer after layer of speech or ambient sound together until he achieved the right atmosphere, often with several people speaking simultaneously and with a lot of ambient sound.

13. The sixties and the seventies was the era of the transistor revolution. It opened up a new world of possible applications and sound was one of them. The good sound quality in ordinary home electronic equipment put pressure on the film industry to be equally as good. Different improvements in sound technique were applied to cinema as well, and there was a gradual increase in quality.

This was a period with great differences in sound quality and sound practices. There was new style experimentation, but also a lot of very traditional use of sound continued.

14. The breakthrough of the Dolby technique with four channel stereo and broadened frequency range around 1974-75 was one of the big events in the history of sound. There is reason to talk of **before and after Dolby**. With magnetic sound on film in the fifties the audience got to experience some of the hidden possibilities in stereo technology- some sound kinetics and some special effects. Quite a few films with magnetic sound developed ambient sound and sound effects of quality. It is however first with Dolby that these possibilities were fully exploited. Now we can note a wider use of ambient sound and more passive off-screen sound. With stereo and livelier off-screen space one also gets more interplay on screen – off-screen.

15. The next steps in the sound technology were the Sound surround system and THX. These increase the audience's feeling of participation, and many action and horror films are made using them. They help in the spatial orientation and many "high speed, quick turns" scenes have been expanding their limits with that technique. If there was a lot of moving in unknown terrain there was a need for a re-establishing shot now and then to confirm the separate positions of characters, but with THX this is not needed; the sound makes the audience aware of the spatial orientation.

16. Sound editing practices have changed gradually. The borderline between what is perceived as "true" and "expressive" reproduction is not evident; it has developed over the last decades.⁵⁵ The audience has got so used to exaggerations in sound and sound changes that they accept it as normal. The editing can be, and is also, much more expressive today without losing the character of being realistic and true.

17. The new ability, due to new electronic technique, to record, process, modify and combine sound and sound elements, opens up a world of possibilities for the use of ambient sound and sound effects. The

⁵⁴ Chion, Michel, *Audiovision: Sound on Screen* p. 70.

use of that started already in the fifties, accelerated during the sixties and had a major breakthrough with Dolby. One line was to improve the direct sound from the "real" world, another to create completely new synthetic sound. In practise it worked out to be very much a combination of the two.

Individual initiative and creativity geared the development but one can also identify a structure based on logical reasoning. High pressures was put to modify sounds that previously did not work so well or where there were hidden potentials. It is in those areas greatest changes can be noted:

- Sounds that earlier came out lifeless and numb.
- Sounds with hard profile that earlier easy came into conflict with other sound like speech.
- Sound connected with emotional situations. With the new possibilities it showed to be effective to communicate a broader spectrum of emotions through ambient sound and effect sounds. Well designed can these sounds in some areas be superior to music that was used previously for the same function. The human interaction between the senses makes the audience understand the sounds as realistic and "true" although they can be highly artificially and exaggerated. A realistic diegetic sound could now replace nondiegetic music for emotional effects.

Boxing sound is an example of a sound connected to emotional situations that previously did not communicate very well. It has developed a great deal and is now an almost completely constructed sound that very efficiently communicate the emotions of swift movements, hard punches, pain, hatred and dizziness all important dimensions in a boxing scene. Similar sound is used in most film; it has become a well established convention. It is conceived as a realistic sound, unless used in an exaggerated way. It can be used in a flexible way depending on the situation, tiredness, relation between the combatants etc.

Similar development can be noted in other sound themes. The ambient sound and sound effects has increased its importance; they are used more both for narrative and emotional effects and sound that is understood as realistic and "true" has drifted a long way into the world of artificially constructed sound.

⁵⁵ My hypothesis is that a long period of constant drilling in mass media has made audiences willing to accept a far reaching expressivity in the sound editing as true.

Vision of further cinema studies.

The obvious continuation of this work is to analyse more films within each theme. With a broader base, the analysis can be deeper and identify more nuances. The next step is to take up other themes. Theme is a broad term in this context and it can be almost any subject that seems interesting to isolate, a specific environment, a specific activity, a film director or a composer.

A number of themal studies can together constitute a network, a reference base to which it is possible to relate individual film studies or studies of similarities.

As shown in the introduction analysis starts with differences, differences put a focus on what can be important. Similarities can only be identified and valued against a landscape of differences.

From this network, I propose that it is possible to develop some broader style concepts. There are many films that have a similar combination of sound elements and together they form a group with a particular style. The easiest way to label that group is to single out one particular film to represent that style. In that way it would be possible to create a set of films which represent different styles and that would make the subject much easier to talk about.

When a network of themal studies is achieved, some broader style concepts are identified and we have a set of films representing these styles, then it will be time to really write a history of film sound development.

Filmography

Alien (Ridley Scott, 1979).
A Nightmare on Elm Street 3: Dream Warriors (Chuck Russel, 1987).
Annie Hall (Woody Allen, 1977).
Apocalypse now (Francis Coppola, 1979).
The Blues Brothers (John Landis, 1980).
Body and Soul (Robert Rossen, 1947).
Bonnie and Clyde (Arthur Penn, 1967).
Bullit (Peter Yates, 1968).
Cape Fear (J Lee Thompson, 1962).
Cape Fear (Martin Scorsese, 1991).
Children of a Lesser God (Randa Haines, 1986).
Citizen Kane (Orson Welles, 1941).
The Color of Money (Martin Scorsese, 1986).
Do the Right Thing (Spike Lee, 1989).
Earthquake (Mark Robson, 1974).
Enter the Dragon (Robert Clouse, 1973).
The Fifth Element (Luc Besson, 1997).
Fitzcarraldo (Werner Herzog, 1982).
The Hustler (Robert Rossen, 1961).
The Informer (John Ford, 1935).
Jaws (Steven Spielberg, 1975).
Koyaanisqatsi (Godfrey Reggio, 1983).
The Hunt for Red October (John McTiernan, 1990).
The Long Riders (Walter Hill, 1980).
McCabe and Mrs. Miller (Robert Altman, 1971).
Medicine Man (John McTiernan, 1992).
Merrill's Marauders (Samuel Fuller, 1962).
Midway (Jack Smight, 1976).
The Mission (Roland Joffe, 1986).
Mon Oncle (Jacques Tati, 1958).
Night of the Living Dead (George A Romero, 1968).
Persona (Ingmar Bergman, 1966).
Psycho (Alfred Hitchcock, 1960).
Once upon a Time in the West (Sergio Leone, 1969).
On the Waterfront (Elia Kazan, 1954).
Prénom Carmen (Jean-Luc Godard, 1983).
Raging Bull (Martin Scorsese, 1980).
Raiders of the Lost Ark (Steven Spielberg, 1981).
The Robe (Henry Koster, 1953).
The Rock (Michael Bay, 1997).
Rocky (John G Avildsen, 1976).
Rocky IV (Sylvester Stallone, 1985).
Rumble in the Bronx (Stanley Tong, 1997).
Runaway Train (Andrej Konchalovsky, 1985).
Scream (Wes Craven, 1997).
Star Wars (George Lucas, 1977).
The Sting (George Roy Hill, 1973).
The 39 Steps (Alfred Hitchcock, 1935).
This is Cinerama 1952.
The Wild Bunch (Sam Peckinpah, 1969).

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