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Sound Effects

Strategies for Sound Effects in Film

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Sound effects in film have been created since the beginning of the re-recording process in the late 1920s by three major procedures: they were either recorded directly on the set, gathered wild (i.e., non-sync), or created by a Foley artist. During the classical Hollywood era most films were produced within the studio environment. This practice led to a shift for sound effects to be produced mainly in postproduction. At the same time many functions of sound effects were taken over by the music, partly due to the technical properties of the optical track. With the emergence of magnetic multi-channel systems in the 1950s a slight change occurred. Apart from some notable exceptions it was not until the mid-1970s that sound effects were widely used in a variety of functions. Explanations for this change can be found not only in differing production conditions but also in broader cultural developments, in the influence of the European art cinema on academically trained film directors as well as in a heightened sense for the power of sound in general within the popular culture.

A Modular Framework for the Description of Sound Effects

Verbal denomination of sound effects is the foundation not only of inter-subjective communication but also of a differentiation in the perception process. Once different categories are established verbally, they are also open to thoughtful insight in the great variability of sound objects both in nature

and in artistic applications. It is therefore no surprise that early description models stem from the founders of *Musique concrète*, especially Pierre Schaeffer. With *Traité des objets musicaux* he provided the most comprehensive work to date, its only drawback being the vastness of the applied terminology.¹ In order to analyze and discuss sound effects I have developed a very simple modular framework for the description of sound effects, based on five questions regarding the source of the sound as well as its acoustic shape.

This system has the aim of posing questions about a given sound object in a series of passes. The answers to these questions lead to the individual modules from which the description itself can be assembled. In view of the lack of a common specific vocabulary, I have decided to use well-established concepts. These concepts may be less precise than would be desirable, but their intuitive nature led to their use by both Schaeffer and Schafer.²

What Is Sounding?

Phylogenetically – in the course of the evolution of mankind – it has always been a necessity to deduce the source of a sound, in order to determine in a matter of seconds whether it was a prey or predator and to react accordingly. Such largely automatic responses play an important role in our lives even now, for example in dealing with traffic. They are the outcome of a lifelong process of learning from a multitude of sense impressions. Visual, tactile and auditory experiences all contribute to our perception of objects.

Chion calls the investigative form of hearing *écoute causale*.³ It is a concrete form of auditive investigation of our sound environment in response to the question: What is sounding?

The name of the source of an acoustic event can be understood to be a *label*, functioning as a simplifying orientations criterion, which creates comprehensible categories in order to store them in our memory.⁴ So it is that I hear ‘a horse’, ‘a car’, or ‘the sea’. This first process of description serves to divide the continuous flow of sounds into individual parts and to roughly categorize them. However, I must emphasize that the ordering of sounds into categories according to their source, while a necessary step in the process, is by no means sufficient for analyzing sound effects. The meaning of a sound is not necessarily identical with the meaning of its source.

Furthermore, a source cannot always be identified. This case will be discussed in the chapter ‘*The Unidentifiable Sound Object*’.

What is Moving? (The process-related nature of sound origination)

Sound is essentially related to movement. Movement only originates sounds. Thus, the second module of sound origination focuses on this process-related component.

The matter is relatively simply, when the agent is a living being, such as an animal or a person. The processes which originate the sound in this case can be primarily divided into activities or verbalizations. Dogs bark, sheep bleat, horses whinny. The procedural forms include the many types of movement in space, such as those of vehicles (in the most general sense) or living beings: footsteps in all their variety, driving, galloping. Human activities – whether visible or not – generate an almost unlimited variety of sounds.

However, our analysis of sound processes will make it clear that the source of the sound is not identical with the agent (in the sense of the originator of an action). It is not the person who makes the sound, when he opens or closes a door, but rather the door itself, which is passively acted upon. In the uninhabited world, processes are much harder to identify, since they take place interiorly. The object as a whole appears static, while the movement takes place inside it: the hard disc hums inside the computer, the hammer strikes the bell inside the telephone, the loudspeaker membrane is driven by electrical pulses.

In many cases sounds are also generated by interactions between objects. This may lead to either both objects, the driver and the driven object, or only one of them being set in motion. *Footsteps* are a good example of such an interaction: the material of both the shoe and the ground can be heard.

What Material is Sounding?

Materials originating sounds are especially easy to describe. The material component of sound origination is perhaps even easier to generalize than the relation of the sound to its origin. In other words: even more than its origin, a sound betrays its material components. Wood, metal, water, stone and paper all have unique signatures. Not only the material but even its current material condition is expressed in sound objects: for example, water as steam, rain or ice. Material and source can also be one and the same; in this case the material replaces a morphologically differentiated source. Air, for example, is a material which due to its nature has no functional form but can be heard as wind when it passes over other objects. Material traces are of extraordinary importance to sound aesthetics.⁵

How Does it Sound?

In contrast to their material composition, the acoustic qualities of a sound are relatively hard to express. I believe that onomatopoeic verbs are best suited to express the acoustic aspect of sound effects. I use them in my description as adjectival gerunds: for example, blubbering, droning, howling, roaring and swishing. Onomatopoeic expressions are especially useful because they directly express the acoustic quality they describe. In other words, there is a relation between their form and content, in which the word itself creates a sensual impression.

Of course, the everyday descriptions of acoustic qualities cannot be objectified. There are, for example, no objective criteria to distinguish 'thunderous' from 'booming'. A set of objectifiable acoustic qualities is presented in Flueckiger.⁶

Sometimes even the frequency range of a sound object may be clearly perceived, and this quality can be used in the description: low, mid or high range. The same can be said of the sound level – loud or soft – and striking rhythmic qualities which can be assimilated to simple concepts, such as regular, fast-paced or hasty.

Where Does it Sound?

The spatial situation of a sound is the last of the descriptive modules. This covers both the location of the sound's source and the spatial qualities of the location itself.

The spatial location of its source is evident in the sound object as its distance – for example, nearby or far away, foreground or background. The distance is only partly a matter of volume. As a sound recedes into the distance it changes acoustically and becomes more mid-range. The relation between direct and diffuse sound also changes: the diffuse sound components become more important and can be heard as reverberation. For the purposes of the description of sound objects we can rely on intuitive perceptions. Is there reverberation? What type of space is characterized by the reverberation? Long school corridors, a small tiled bathroom, an empty warehouse?

Sound objects do not only cover distances, they also pass through obstacles, such as walls. The sound traces of such obstacles can also be heard and described.

Primary Semantics

From the stylised sound effect in the classic era to the emergence of the independent sound object in contemporary films

The notion 'classic' implies a highly elaborate normative system. In conjunction with the limited significance of sound effects as mentioned above a rather restricted vocabulary of very stylized sound effects evolved. The stylization was carried even further by the working conditions in the studio system with technicians pigeonholed in their editing rooms. Sound effects were stored in each studio's sound library. It was an unwritten rule that sound effects had to be subordinate to the visual dominance in the storytelling process.

The inter-textual references that gave birth to the individual stylistic traditions were also based in the need to organize labour. As mentioned above, films used to be manufactured in the controlled environment of the studio. Under these conditions, location recording meant dialogue recording. Since the non-verbal elements were largely taken from archives, the sound library was the birthplace of the strong stylization so typical of this period of film production. The principle of aesthetic recycling led to a significant reduction of the individual sound elements. Successful sound objects were transformed into archetypes by continual repetition: the gunshot from *Shane* (dir. George Stevens, 1953) or the wind from *Yellow Sky* (dir. William Wellman, 1948). Stylized in this way and dominated by dialogue and music, sound effects lost their genuine wildness.

Contemporary soundtracks, on the other hand, provide a complex acoustic arrangement. In addition to their original wildness, with an abundance of detail they are layered on sometimes several hundred tracks, even up to the point where they mask each other. This strategy expresses a different approach to the fictional construction, which tries to simulate more the compound soundscapes in the real world than to refer to established formulas. With tiny fluctuations even in the seemingly most insignificant details these sound effects aim at a higher degree of authenticity, thus hiding the very thoughtful process of their construction.

In the context of the New Hollywood we can see the influence of rock music as well as various movements of the late 1950s and 1960s, such as the French *Nouvelle Vague*. The *Nouvelle Vague* had a different approach to production from that of the classical mainstream film: location shoots,

minimal post-production, acceptance of the chaotic complexity of the everyday natural world, without manipulative interventions and without a dramaturgically motivated sequence of climaxes.

However, the effect of an unstructured soundtrack was primarily the result, in the *Nouvelle Vague*, of a changed production process rather than a technical principle. It was not technical innovation, but rather *ideas* which guided the development of the *Nouvelle Vague* and led over time to the rich sound culture of French film. Without this influence, some of the most gripping soundtracks of the New Hollywood would hardly be thinkable.

In contrast to their French predecessors, American soundtracks were not by-products of a concept but precisely calculated effects which were not intended to overwhelm the fictitiousness of the production; they were, rather, virtuoso expressions. The aim was thus not to represent the original multiplicity of a natural sound space but to analyze the complex whole into its detailed components and rebuild it on the basis of this appropriation.

The aim was to reconstruct in detail a seemingly authentic, unclean sound. The resulting extreme artificiality – which still endures – is in itself so coherent as to be immediately acceptable as natural, as is confirmed by audience reactions. Even the most attentive film buffs assume that the sound objects are originated in pro-filmic reality.

Walter Murch⁷ and Ben Burt⁸, who have both played leading roles in this stylistic revolution, see the change in working processes as an important basis of this new aesthetic. The new creative freedom, combined with new flexible and highly expensive technologies, have made possible the intensive detailed work on sound which is characteristic of the autonomous sound object of contemporary film. This is characterized by a sensory surplus of the merely communicative and indicative function of sound. Minute changes in sound are used to simulate the beautiful randomness which is to be found in living nature.

The Unidentified Sound Object USO

The basic characteristic of unidentified sound objects is that they have been severed from any connection to a source. A source is neither visible nor may it be inferred from the actual context. In addition, spectators are denied any recognition cues. In general the level of ambiguity is not reduced but carefully maintained in order to build up emotional tension in the viewer/listener.

The preservation of ambiguity is in fact an unspoken goal of the deliberate inclusion of USOs. As early as 1939, the Brazilian filmmaker Alberto Cavalcanti had already argued for the use of USOs in order to create

suspense: 'Have you ever heard a noise in the night – non-sync – i.e., without having any notion of what caused it? Of course. And you left your bed and went down to find out what caused the bang, or the thump.'

Cavalcanti considered the fundamental differences between seeing and hearing to be responsible for the suggestive, emotional character of the unidentified sound object, which triggers instinctive reflexes that may already be observed in infants. Cavalcanti's idea was far ahead of its time. In classical Hollywood films up to the end of the 1950s the use of unidentified sound objects was extremely rare. During this period, only very few productions made significant use of them, for example Charlie Chaplin's *Modern Times* and Orson Welles's *Citizen Kane*. Both films rejected the Hollywood conventions of the time.

In the context of the stylized Hollywood film, *Citizen Kane* still seems as out of place as ever. Vagueness and indeterminacy can function as stylistic devices only when they are not understood as errors. Thus, a technical prerequisite for such use of sound is high resolution with precise tonal definition. As long as a sound object is generally considered unidentifiable when its source is not clearly demonstrated by a corresponding image, every USO remains a disturbance. However, an unwanted disturbance suddenly exposes the technical apparatus and unmask the film as an artefact while also breaking the illusion.

The USO can be understood as an open, undetermined sign whose vagueness triggers both vulnerability and tense curiosity. As an empty space in the text, it functions like a screen upon which the viewer's individual, subjective creation of meaning may be projected. The ambiguous sound object poses a question, which the viewer will attempt to solve through interpretation.

The longer the ambiguity – and the information deficit that accompanies it – persists, the stronger the emotions that are triggered. This uncertainty has an emotional component because it is experienced as a loss of control. From this point of view, the USO is an instrument for deliberately frustrating the spectator by producing a feeling of powerlessness and fear. In the case of the USO, such feelings of fear are doubled, as they are also triggered on the instinctive level. Dangers in nature have been brought to our attention through noises. The most threatening, however, are the noises which cannot be attributed to a known source within a reasonable amount of time. This is supported by the findings of my analysis: science-fiction, horror and disaster films use the highest number of USOs.

Within the closed narrative forms of the mainstream film with its obligatory happy ending, the USO represents an artistic device that does not correspond with genre conventions. The pleasurable experience of fear and

the temporary loss of control are underscored by this affirmative context, which continually reminds spectators on several levels that they are experiencing an artificial world distinct from lived reality.

Secondary Semantics

Higher order meanings are generated when a further context enriches the simple meaning of a sound object. This includes forms of meaning modification by means of social convention or religious or ritual practices; however, these may also be genre-specific phenomena which are built up by inter-textual repetition, especially stereotypes. Within filmic works themselves, higher order meanings (so-called super-signs) can be created by means of structural sequencing, such as leitmotifs.

Signals

Sound objects which have a societally determined communicative content, are commonly called *signals*. This common expression is to be distinguished from the physical meaning, in which every sound event is called a signal. The communicative content of signals is generally a spur to action, often linked with a warning. Taken as sounds, however, most signals are formally very simple. Given their warning or indicative function they are conceived to strike us strongly. For this reason their base frequency is in the 1–2 kHz range, to which the ear is particularly sensitive.

From the historical point of view, signals can be seen as originating in the growth of social formations. The extension of early settlements was matched to the distance to which the human voice can carry. Although a European city of the size of Vienna was – even in the eighteenth century – so quiet that the voice of the watchman on St. Stephen's Cathedral was sufficient to warn of approaching danger,⁹ other systems, such as gongs, horns and bells, had already been invented to bridge even larger distances. And they had other communicative functions than merely warning of danger.

Honking, sirens, ringing telephones, bells and many other signals belong to the repertoire of almost every soundtrack, no matter from what period, content or genre. Two factors have led to this privileged position of signals: they are not only easy to create, but their simple structure and clear communicative meaning makes them easy to identify even under unfavourable technical conditions.

In the context of film, signals are only partly to be understood as spurs to action. It is first and foremost ringing telephones and doorbells which are directed at the characters in the course of the narrative, as well as a

number of the most common alarm signals – sirens and computer beeps – which warn of concrete danger. Their call to attention is not just a matter of the context, but also of the manner in which they are prominently located in the foreground.

But much more often their first order meaning – the indication of a source, the constitution of an object or a spur to action – is subordinate to a second order meaning. Second order meanings include the indication of a setting – sirens hint at urban chaos, ringing telephones are characteristic of police stations – or even more general forms of affective meaning, such as stress, danger, threat or aggression. In brief: when signals are heard, they very often have a negative connotation. In the exposition, in action sequences and showdowns they are an indispensable means of raising the emotional stakes, heightened by the usually hectic rhythm. In contemporary mainstream films their suggestive appeal to our emotions is increasingly separated from their verifiable plausibility. Sirens, ringing telephones and alarms are edited in wherever they fit the dramatic development or psychic state of the characters. Mimesis is only loosely maintained – the illusion, that is, that the sound object has a source somewhere in the real world represented by the film.

Stereotypes

The term ‘stereotype’ stems from the social sciences where it describes a shift from an attitude to a prejudice. This shift serves the individual to orient itself in a complex environment and is built up by tradition rather than direct observation. In media theory the term has lost its purely negative meaning as a result of studies of popular mass culture. This can be seen as a reaction on the part of theorists to the increasing trend in popular mass media to continuously recycle the same forms and motifs, as can be seen in the numerous series of pulp literature, TV and mainstream film productions.

What, then, are stereotypes? Lippmann imported the term from book printing terminology, where it referred to lead lettertype, into the social sciences, to describe the consolidation of attitudes into prejudices.¹⁰ Even then, he viewed this discrepancy between simplified interior processes and the complex outer world as serving the purposes of orientation. The simplification, according to Lippmann, was a result of transmitted attitudes: ‘We are told about the world before we see it. We imagine things before we experience them. And those preconceptions govern deeply the whole process of perception.’¹¹

In its transfer to film theory, a number of the constitutive components of the concept of stereotype have been preserved, while others have

been modified. My use of the concept is taken primarily from Wuss¹² and the very exhaustive and informative work of Schweinitz.¹³

The fundamental characteristic of film stereotypes is to be found in the large-scale repetition of narrative complexes and their component optical and acoustic representations. Schweinitz calls them 'homologous, intertextual structures',¹⁴ structures, in other words, which remain the same throughout a very large number of films and for a long period of time. This retains the aspects of consolidation and transmission characteristic of the original concept.

Stereotypes have to be learned. By frequent repetition they are inscribed into our long-term memory and are anchored there as cultural constants. Due to their continual use in a given communicative context, they provide a basis for latent expectations.

They are, in part, consciously perceived. Fans of particular genres greatly enjoy their connoisseurship: they are delighted to recognize similar narrative structures in new contexts. In the frame of these ritualized structures, negative emotions such as stress or aggression can be experienced as pleasurable, since the ritual facilitates mastery of negative emotions.

The thoroughly automated processing of stereotypes is the basis of one of their most important functions. Habituation renders them unremarkable and enables them to be perceived very easily and to penetrate ever deeper into the spirit.

As they are built up, stereotypes are not only consolidated but also undergo a very specific amplification of their meaning. Since they are always experienced in a given genre and context, they assimilate the meaning of their context. Thus, ricochets are the hallmark of westerns or the tireless beeping of futuristic computer equipment the specific trait of science fiction. The media-conscious postmodern director is a virtuoso exploiter of such secondary meanings and reassembles them in new ways to play with the standard expectations of his audience. Film sound stereotypes can thus serve the purpose of efficient communication while activating a rich network of inter-textual associations.

A specific feature of some stereotypes is that they are distinct from physical reality: there is no wind on the moon, nor do spaceship engines make any noise in space, and computers generally only beep when they are signalling an error.

Sound designers with higher standards only use pure stereotypes from the sound library when they contribute directly to an automatic perception of meaning. They will much more frequently start with a precise knowledge of a stereotype and use it in a subtly modified way.

Symbols

Symbolic sound effects have a second, latent connotation, which in most cases is not necessary to the understanding of a film. The sound of bells for example has acquired a powerful set of meanings in Western culture, while many animal sounds are associated with the symbolic signification of the animal itself.

Symbols are rooted in non-filmic, generally religious, mythic or social traditions: religious symbols such as the cross, social symbols such as styles of clothing, psychoanalytic symbols such as the phallus and political symbols such as the Nazi swastika, etc.

The concept of *symbol* used here refers to a higher level of abstraction with second- and third- order significations. Symbols have no well-defined meaning, but they do require an interpretative effort on the part of the audience if they are to be understood. A symbol represents an abstract concept. For example, if we hear a rooster crow three times in the deadly silence of a Sergio Leone western when the traitor gets his comeuppance, the context is sufficient to set off a process of symbolic interpretation.

It seems to be characteristic of filmic symbols that they arise from an asymmetry of image and sound and that either the image can be seen or the sound heard: it is very rare that both are represented together. It is thus typical that the rooster in the Sergio Leone western is only represented on the soundtrack. This strategy prevents an overly simple subordination of the object to the diegesis.

The symbolic repertoire of film is far vaster than one might suppose, but it is unequally distributed between individual films. The first generation of New Hollywood directors – Spielberg, Scorsese, Coppola – as well as directors of European origin – Jean Renoir, Fritz Lang, David Lean, Sergio Leone – stand out from the crowd in this respect. When symbols are edited into the soundtrack, it is in films in which visual symbols are also used or in which the characters are not mere actors in the narrative but have a deeper psychological structure. Such films can be read on many levels. In particular, the films of Steven Spielberg, in their mix of slick action and symbolic depth, are similar to fairy tales, and it is not only rewarding but also fun to speculate about their various meanings.

Whether a viewer is able to grasp the latent meaning of a symbol depends on his or her specific life experience, cultural and intellectual education, imagination and sensitivity. On the other hand, a latent meaning is in principle only available when it is correlated to a tradition or is carefully built up within the filmic text. Mainstream films, as products of a medium

which must span multiple cultures, are aware of this condition, and symbols are always kept in the background as optional conveyors of meaning. To return to the Sergio Leone example above: the film can also be understood without recourse to the symbolic meaning of the rooster's crow drawn from biblical tradition.

Key Sounds

In contrary to stereotypes, signals and symbols, which acquire their secondary meaning either inter-textually or culturally, *key sounds* develop it within the film by repetition and variation. The key sound develops a heightened significance not only by narrative associations but also by the carefully constructed wealth of the acoustic appearance.

By the term *key sounds* I refer to sound objects which, due to their clearly perceptible intra-textual frequency, their strategic placement – mostly in the exposition and other key scenes as well as their integration into the fundamental thematic content of the film – accumulate a specific meaning. In contrast to leitmotifs, which are built on a similar mechanism, the modification of the meaning of key sounds is not a consequence of their relation to special events, locations, characters or ideas. It rather arises from their exchanges with the narrative context, with their *aboutness*, ‘what the hell was that about?’¹⁵ a sort of resonance, which gives key sounds their special status relative to other sound objects. In terms of sound, this privileged status is evident in their more careful, variant-rich structure, as well as often in forms of transformation and enhancement.

Perhaps the most famous and, for the purposes of this discussion, most fruitful example of a *key sound* is the helicopter sound object in *Apocalypse Now* (dir. Francis Ford Coppola, 1979). In the opening sequence, the helicopter flies through the theatre from all four directions, from rear right to rear left, front left to front right. Its perceptible qualities alone, such as its extreme spatiality and its acoustic difference tend to focus our attention on it. The brutality of the Vietnam War as the fundamental theme of the film – its *aboutness* – is immediately deepened in the opening sequence via the complex of images of destruction, perception distorted by drug use and apocalyptic pop-decadence.

Thus all basic components of the key sound are strongly represented: correlation with the theme of the film, strong and immediate perceptibility and strategic placement in the exposition. More than an extension of meaning, we seem to be dealing here with a concentration of meaning: a sort of implosion of external elements into a single sound object – in this case the helicopter.

Leitmotif

The *leitmotif* on the other hand has an indicative function strictly associated to certain characters or locations. Coined in 1851 by Richard Wagner in the context of his opera theory, the term describes an abstract commentary function in regard to the psychological condition of the characters as well as metaphysical aspects of their being. While Adorno et al. doubt the possibility of the *leitmotif* technique in film fundamentally,¹⁶ the close analysis of a large group of mainstream films has demonstrated that it is used not only in its trivial function as an indication but also in a much deeper sense for the intra-textual construction of meaning.

In their critique, Adorno and Eisler were primarily targeting those compositional practices which limited themselves to simply using repetition of melodies to label persons and locations, without using the interaction of sound and image to achieve (or even attempt to achieve) a higher level of abstraction, whether metaphysical or symbolic. The detailed analysis of a few examples clearly demonstrates that it is precisely in its potential to create complex webs of referential and abstract meaning that the *leitmotif* holds great promise for the achievement of a convincing dramatic structure.

The *leitmotif* is a mechanism capable of dynamically constructing meaning within the work, as well as being a structure-building principle of the highest order. The first appearance of the *leitmotif* is decisive for the success with which it conveys meaning. It must be strategically placed so that there is an unequivocal and very clear interplay between the sound and the image. The concept of priming, developed by the cognitive psychology, is of value here. Priming means pre-activation of the attention. It opens a specific semantic register or field of meaning for subsequent information. Thus the initial exposition establishes whether the symbolic meaning has to do for instance with death, danger or happiness.

The meaning of the *leitmotif* has to be acquired. The audience must develop a system of rules or an abstract structure of stimuli, 'without purposefully searching for rules and without even being aware of them.'¹⁷ Once established by priming, the *leitmotif* must be reinforced and anchored in the memory by repeated association, until the linkage is so stable that the musical motif or sound object alone is capable of representing the entire complex of associations. Repetition is thus an obligatory component in the creation of a *leitmotif*.

Can sound objects be *leitmotifs*? The original, musical concept did not provide for the use of sounds as *leitmotifs*. But as early as the Baroque period, music had developed references to non-musical reality by imitating natural sounds – a famous example is Vivaldi's *Quattro Stagioni*. Signals such as the

hunting horn or fanfares, animal and especially bird sounds, and natural sounds such as thunder and lightning have all been used in musical compositions as *Tonmalerei* ('tone painting'). The difference from the original leitmotif consists in the fact that the sound object or its imitation carries with it into a narrative or visual context a pre-formed meaning (symbolic or referential), the meaning of which changes during its interaction with the context as it is repeated. The relationship is thus reciprocal. Two meanings form a super-sign at a higher level of abstraction, which develops dynamically by means of repeated exposition. Thus all requirements of a leitmotif have been satisfied: the creation of an abstract symbolic meaning, increasing autonomy – the sound object is capable of representing the symbolic complex on its own – and the building of an overarching dramatic structure.

Sound-Image Relationship

With the term 'added value', Michel Chion introduced a very useful concept for the description of the sound-image relationship,¹⁸ thereby opening up the former dichotomy between contrapuntal and redundant use of sound as established in early sound theory, notably by Eisenstein et al. in their famous 'Statement'.¹⁹ The added value denominates an energetic flux between two concepts, one of them displayed by an optical and the other by an acoustic representation. These representations modify the perception of each other by adding or stressing certain attributes while attenuating others.

The question regarding an adequate linkage between sound and image was debated especially fiercely at the beginning of the sound film era. Some of the most creative makers of silent films were far from happy about the introduction of sound. Eisenstein et al. expressed their fear that after an initial period of astonishing sensations, the sound film would decay into a conservative theatrical form and lose its creative independence.²⁰

But mainstream cinema has not heeded the recommendations of Eisenstein, René Clair and others. On the contrary, the few sounds edited into the soundtracks of classic Hollywood productions were almost exclusively related to visible objects. This is because sound effects, in comparison to speech and music, are strongly compromised by a limited frequency range of a sound medium, since they are largely non-harmonic. When we hear harmonic sound objects – composed of a fundamental and a number of overtones, which are harmonics of the fundamental itself – our brain adds in the fundamental even when it lies outside the range of transmission. Among noises, only a number of signals as well as some animal sounds have a harmonic structure.

The cinematic medium was thus found to be incomplete because of technical failings and the inexperience of the viewer. Attempts were made to counter this incompleteness by coding objects and actions in two ways, both optically and acoustically. The resulting redundancy, which was explicitly criticized by the authors of the 'Statement', acted to prevent incomprehension on the part of the viewer which, in the classic Hollywood production had to be avoided at all costs.

There was a reciprocal relationship between visual and acoustic representation in the classic Hollywood film, which can be summarized in the motto 'See a dog – hear a dog'.

Synchresis and Added Value

As already mentioned, motion generates sound, no matter where it occurs, and the sound must be precisely adapted to the optical representation. This is why, in cinema, sound not only unifies the perception of time but also structures its flow. The function of structuring cinematic action in time is given great importance by Chion for this very reason.²¹ He established the concept of *synchresis* to describe the temporal matching of image and sound:

Synchresis (a word I have forged by combining synchronism and synthesis) is the spontaneous and irresistible weld produced between a particular auditory phenomenon and visual phenomenon when they occur at the same time. This join results independently of any rational logic.²²

Synchresis is based on the mechanism of inter-modal matching of stimuli from visual and aural perception. It is one of the fundamental requisites for the *substitution* of original sound by means of *automated dialog replacement* ADR, Foley and sound editing. The division of the image flow into individual frames means that the optical representation is unable to adequately render very fast motions or short body contact.

Equally fundamental to the comprehension of the sound-image complex is the concept of added value:

By added value I mean the expressive and informative value with which a sound enriches a given image so as to create the definite impression . . . that this information or expression 'naturally' comes from what is seen, and is already contained in the image itself.²³

Even more than synchresis, *added value* places weight on the signification of this interaction. As a basis for the following discussion of the construction of meaning in the exchange between sound and image we use recent conceptions from semantics which investigate the dynamic aspects of meanings.²⁴

Added value indicates an energetic flow between two concepts resulting in a third concept which can be explained neither by reference to the one nor to the other. In the interaction between two concepts – one acoustic and one optical – a number of characteristics come to the fore, while others are, so to speak, anaesthetized. Goschke and Koppelberg note that in essence concepts are by no means stable, invariant structures.²⁵ Mental representations in long-term memory are continuously changed and adapted on the basis of new experience. ‘The impression of the stability of conceptual structures is more likely to be an artefact of the construction of common denominators over a large number of persons, contexts and tasks.’ This brings a variable into play which may be of great importance for the following consideration: *typicality*. Actual representations of objects (tokens) can be perceived as more or less typical depending on the extent to which they agree with or differ from the above described common denominator: a sparrow is a more typical bird than a penguin, for example. Prototypes are characterized by the fact that they almost ideally represent this common denominator. Examples of prototypes on the soundtrack would be, for instance, the big sound of a gunshot, the discreet sound of a door closing or a blow from John Wayne’s fist.

The degree of typicality of the optical and acoustic representation determines the strength of the common denominator generated by the interaction between the two modes. As an example, consider the notorious clapping of horses’ hoofs, created by the Foley artist with two coconut halves. Out of the myriads of conceivable sound objects which might be generated by horses’ hoofs on different types of terrain, this sound represents the above-mentioned prototypical average. Interestingly enough, this prototypical stylization has been generated precisely by artificial substitution, since the same standardized means of sound production are always used in the studio. The function of clapping hoofs is thus first and foremost that of indicating a source, which in words might be expressed as ‘there is a horse’; since the expression does not go further than this indication, it is largely provided by the visual perception: we see the source, which is the horse itself. This results in the greatest possible redundancy between the two forms of representation, and their association is automatic and smooth. The concepts

run together into a single, relatively stable concept, without anything new being created. The added value tends towards zero.

The mechanism of this interaction becomes significantly more complex when unstable or ambivalent concepts are associated with each other. We discuss this possibility in the context of a fictional object, the light sword from *Star Wars* (dir. Lucas, 1977). Switched off, it looks like a short metal rod; switched on, like a shining neon tube.

It is primarily its designation in speech as 'your father's light sabre', followed by its first use, that makes this object into a weapon. However, there is a certain discrepancy between the optical representation and the intended function, which had to be bridged by sound designer Ben Burtt, since the image lacked the quality 'dangerous' which is obligatory for weapons.

The construction of the object is achieved by integrating disparate characteristics, which goes far beyond their simple indicative function. Specific characteristics were used to establish functions including consequences, processes, a hypothetical material composition and sensual qualities. The sound object itself is composed of various component concepts, which are associated with various processes: the tone modulation of the humming sound as the object moves in space, the hissing sound as it is switched on, the crackling of contact. The tonal qualities mobilize everyday sense experiences: the association with speed and power by means of phasing as well as to negative experiences of electricity and heat by means of a crackling sound.

The example of the light sword makes a trend evident: the effect of the modification is in inverse proportion to the redundancy between both the representation of the object on the screen and on the soundtrack. In principle, the more detailed the sound object, the clearer its effect on the visual representation. In the process of intermodal association, it is the viewer who combines the various characteristics of the visual and aural representation into a meaningful whole. The more distant the representations are from prototypical simplification, the greater is the resulting added value.

A continuum of possibilities is available between the redundant interaction in the case of clapping horses' hoofs and the complex interaction in the case of the light sword, which runs along the axis between *similarity* and *difference*. Redundancy is the outcome of maximum similarity between the concepts, with zero added value. At the other extreme of the axis we have maximum difference, which also yields a zero maximum value: If the concepts were completely unrelated, no articulated whole could be built from their interaction. This explains why the counterpoint demanded by

Eisenstein and Clair is so rare and has had little currency as a strategy in mainstream cinema, because it is located at this risky other end of the axis. If we consider the axis between maximum redundancy (complete agreement) and chaos (maximum difference) in terms of its potential for creating added value, it will be evident that this can be maximized when there is a considerable amount of ambiguity.

Narrative Functions

Orientation

Traditionally it has been a main function of sound effects to link the fragmented sections of pro-filmic reality and to tie them to an organic ensemble. By this process, the soundtrack facilitates orientation both in the space-time construction of diegesis and the narrative structure of scenes, sequences, acts and events. The sound effects create complex environments in close interaction with the visuals, the text provided by dialogues and titles, and the music.

The soundtrack has been used since its introduction to characterize locations, since perception of the environment as an unbroken stream of acoustic data is a fundamental characteristic of hearing. The upholstered, whisper-quiet ambience of a hotel lobby has quite a different effect from the cavernous reverberation of a church, for instance. Hearing impressions catapult us – just like odours – back into our early experiences, even after years. They invoke internal images, entire landscapes emerge before our inner eye and long forgotten feelings are awoken. Every place leaves its impression as a complex of specific sound objects.

Terminology

The classic terminology – used by Gorbman and Thompson et al., among others – is founded on the concept of *diegesis*.²⁶ Diegesis refers to the space-time continuum in which a fictional action takes place. A sound is called *diegetic* when its source – object or character – belongs to the diegesis. Extra- or non-diegetic sounds are those which have their source outside the diegesis. This category covers a large part of film music as well as voice-overs, but only a few sound effects can be categorized in this way. Diegetic sounds are further categorized by Thompson et al. as *on-* and *off-*sounds, depending on whether their source is visible in the frame (*on*) or is supposed to be located outside it (*off*). This distinction between *on* and *off* is

often, and rightly, criticized. The problem lies in a basic quality of acoustic events: they are invasive and ubiquitous, and they penetrate walls and go around corners. In many cases it is not possible to determine whether a given sound object has its source in or outside the frame.

My investigations have led me to distinguish the following facets:

1. The single element used to characterize a location, such as the barking of a dog.
2. The systematic organization of these elements in specific clusters, for example 'barking dog plus cicadas equals southern night'.

These two phenomena are related in a hierarchical, one could even say paradigmatic, order to each other.

I use the concept of *territory sound* to indicate the individual element. This does not identify a specific sound object as such but rather its function to define a location geographically, temporally, culturally, ethnically or socially. The barking of a dog – to stay with this most simple example – can also indicate its source and in this case would have an indicative function. The difference between the two functions is perceptible in the sound itself. The dog's bark in its indexing function is located in the foreground, while the territory sound is located in the background by reducing its volume and adding spatial parameters (particularly reverberation). Furthermore, in its indexing function the dog's bark is related to a specific dog, which is generally presented in the image and may even be given a name in dialogue. In this case we are dealing with a token. The territory sound dog, on the other hand, is never to be seen and is not further differentiated, thus remaining a type.

As mentioned above the individual territory sounds are organized on the soundtrack in specific hierarchical structures. I would suggest using the already existing term *ambience* for these sub-structures. In technical jargon and in the organization of sound archives this concept has established itself as a means of indicating entire sound environments, such as 'harbour', 'railway station', 'mountain meadows'. Its everyday meaning is also suited to the function of atmospheres. On the one hand it is related to spatial acoustics, the materials out of which the space is composed, its extension and geographical location, and on the other to the people who use this space and their activities. These are parameters which can be immediately and completely comprehended and which have a very direct influence on the emotional situation. In the following, we will understand ambiances to be sets of territory sounds, which serve to characterize locations.

Ambiences have a similar role to play within the soundtrack. They are the acoustic setting, which enables both orientation in space and time and sets the emotional framework for both the viewer and the characters.

Since they have to deliver their information content immediately without requiring any particular attention from the viewer, they are probably the most highly stereotyped part of the soundtrack, which must also be highly abstract and functional. Ambiences are thus reduced to a minimum and generally consist of distinct bundles of no more than three territory sounds. This strong coding is not only a requirement of the text itself, but above all of communication with a varied audience, which has been conditioned to accept this schematic information. This reduction is characteristic of American mainstream cinema. In Europe, space-time indicators are much more differentiated, a fact which is connected with the existence of a more homogeneous audience familiar with the vocabulary.

It would be mistaken to believe that the use of stereotypes as territory sounds leaves no space for creativity. Crickets – one of the most widely used standards – come in a myriad of varieties, some of which are not crickets at all but rather other insects – locusts or cicadas – which have a similar way of producing their sound.

The highly artificial representational mechanisms which simplify natural sound environments and translate them into a vocabulary of explicit meanings according to a conventional set of rules are well known to the sound designer, but only partly to the viewer, who have a limited intuitive feeling whether the acoustic representation of the environment is correct or not.

The transfer of information is thus extremely efficient, both in terms of the formation of the soundtrack and of the effort required from the viewer. When the mere screaming of seagulls is sufficient to evoke the landscape set 'sea/beach/coast', space is left available on the soundtrack for the differentiated formation of secondary characteristics.

The territory sounds, or at least some of them, generally remain the same throughout the film for a given location, except when consequential changes have taken place or when the entire film – or a great part of it – takes place in a single location. In unusual locations, whose acoustic situation cannot be achieved with the standard repertoire, a number of sets are created for each location which become independent of the image through repetition. An example for this is the Evil Empire in the *Star Wars* trilogy, which is characterized by a bassy modulation. This sound object has no pre-established referential meaning but was established in *Star Wars* (dir. George Lucas, 1977) itself. This procedure has clear analogies to the simplified form

of the leitmotif technique and exploits the mechanism of implicit learning. The viewers are very well able, after a few viewings, to deduce the location from fragments of the soundtrack; they are even struck by how clearly the whole scenery emerges before their inner eye.

In contrary to this highly stereotyped and limited vocabulary there exists a different strategy in films with psychological depth where an abundance of territory sounds does not primarily characterize a geographical location, but rather a relation between the attitude of a character and his environment. They thus surpass the mere indication of a location in order to provide a psychological depiction of the character's feelings. The territory sounds can be interpreted as elements of a latent subjective transformation, which represents the environment as seen from the perspective of the sensitive character. In this case the soundtrack is simulating a mechanism which is familiar to us from everyday perception. Everybody is familiar with this heightened degree of sensitivity, in which every sound is irritating. The subjectively coloured depiction of the environment has gained increasing currency as a strategy in mainstream films since the mid-1970s, especially where the psychological facets of the characters has made it possible.

A significant accumulation of optional territory sounds, often paired with an excessive use of them, is also to be found in certain films which mainly exploit the repertoire of stereotypes, and especially when the psychical tension of the characters is clearly aggravated. These are situations of alienation or disorientation, showdowns and darkness, in which the latter three are often combined.

Generalization versus Dichotomization

The formulaic description of locations by means of stereotypical territory sounds can be understood to be a form of generalization, an overemphasis on similarities. When crickets and barking dogs in the distance as described above mean 'exterior night' independently of the geographical location, this strategy becomes audible. At the same time, generalization means the exclusion of distinctions.

Dichotomization, on the other hand, means overemphasis on differences. It also serves the purpose of orientation, since different situations can be clearly distinguished from each other by means of contrast.

Each addition of ambience to the soundtrack can be understood as a combination of dichotomization and generalization, in which generalization usually has the upper hand. Dichotomization dominates, for instance,

when in *Witness* (dir. Weir, 1985) distinction must be made between the rural, non-technological reality of the Amish and the urban atmosphere of Harrison Ford's character.

An analysis of the two complementary procedures is particularly revealing in structures which by their very nature place special requirements on the orientation mechanism. These are parallel montages, transitions and similar locations with different narrative meanings: for example, the good guys' and the bad guys' space stations.

In the majority of parallel montages, the distinctions are made particularly evident, so that orientation is always possible. The contrast-rich preparation of the ambiances also has the purpose of increasing the hectic rhythm by emphasizing the cuts.

Subjective Transformations

Dreams, hallucinations and other forms of subjective perceptions can be expressed by a shift of the narrative point of view to the perspective of a character. An overarching strategy to communicate these forms of *subjective transformation* is the dissociation of acoustic and optical cues. When sound and image deviate from each other significantly, a logical conflict arises which has to be solved by the spectator. A set of formal processes can be observed which are applied to the sound effects. An additional mode is called 'anti-natural selection': whereby the soundtrack mimics a shift in the attention of a character by augmenting certain sound effects and lessening others. Many of these practices stem from perceptual facets in everyday life. They are called 'simulated subjective transformations', while others – such as reverberation – are called 'marked subjective transformations'. They function as an extra-diegetic commentary provided by the enunciator.

The Dissociation of Sound and Image

The logical-causal relationship between optical and acoustic appearances in the real world is a firm part of perception. Distortions in perception can also occur in real life through the dissociation of sense impression belonging to different modes. Psychotic or cognitive disturbances can lead to a deficit in perception which, among other things, results in behavioural incoherence, since the stimuli from the various different modes do not seem to match each other. Filmic narrative exploits this basis of natural experience, when such feelings are to be represented from the perspective of a given character.

The *dissociation of sound and image* demands a decision to be taken. As a matter of principle, there is a variety of possibilities: either the acoustic or the optical representation is felt to be more realistic and is chosen as the point of reference to which the distorted representation is compared, or both codings yield distorted representations, which may each be distorted in different ways. Such transformations are often found in different layers of the narration. But these changes – and I want to emphasize this point – can only be adequately interpreted, when narrative context, image or sound are not considered in isolation.

The dissociation of sound and image can be expressed by disturbing a natural-seeming relationship of plausibility, which is the result of undermining the empirically rooted probability that the optical and audible events would actually occur in the represented situation. Such a manipulation can be seen in *The Player* (dir. Altman, 1992). When the leading character, in an emotional crisis, kills the person who has supposedly been blackmailing him with letters and telephone calls, not only are the sounds of the action reverbed, but we also hear *bells*, which are linked to the events as a leitmotif and echo in Mills's head over the following days. The bells, as an implausible sound object in the context of the parking lot, are filtered out of the diegesis. The later repetition of this sound object constructs an association with the protagonist's internal world.

The dissociation of sound and image is an overarching technique for a range of different established component strategies, which we discuss below.

Sounds Fade Away

The loss of auditory contact with the environment is the most widely used strategy for subjectivizing sound. This process is also grounded in real-world experience. Hearing is the medium of a constant sensory exchange with the world which surrounds us: we cannot close our ears. Interrupting this acoustic continuum in the course of a film makes a statement. The fading away of sound effects marks or simulates a loss of connection to reality. The subject, the character, is decoupled from the sound environment and thus from reality itself.

In *The Right Stuff* (dir. Kaufman, 1983) the fading of sound expresses the loss of consciousness. While attempting to break the speed record in his rocket plane, the pilot Chuck Yeager loses consciousness. The flight itself is represented very experimentally from a wide array of perspectives. Point-of-view shots are inter-cut with various exterior shots of the jet as well as

close-ups of the pilot's face. In parallel, we are shown his colleagues waiting in a bar. The point-of-view shots are first transformed at a speed of more than Mach 2. The clouds lose their outlines and change into hallucinatory graphics. The sound world of the whole is clearly surreal in its colouring, the jet is always only audible in short clips. The sound of the wind is more evident, as it communicates the speed and the associated border-line experiences. When Yeager loses consciousness and the plane threatens to crash, the silence triggers an anticipation of impending death.

Reverberation as a Means of Subjective Transformations

Reverberation often expresses the mental state of the characters. This use is only partly based on a natural distortion of perception. It is therefore all the more surprising that reverberation has become such a solid and long-lasting strategy for indicating auditory subjective transformations. Examples are to be found as early as the 1940s in, among others, *Murder, My Sweet* (dir. Dmytryk, 1944) and *A Double Life* (dir. Cukor, 1947), as well as in the relatively unknown but sonically innovative *Twelve O'Clock High* (dir. King, 1949). In the examples taken from the film noir series it is primarily reverberation in voices which metaphorically echoes in the head and is thus to be understood as an acoustic flashback.

There is no doubt that this use has consolidated over time, so that we now interpret reverberation as a coded procedure which indicates subjectivization without simulating it. The unchanged spatial situation provides the frame of reference, as well as other reverberation-free sound objects in the same locating context. In accordance with unequivocal nature of coding, this strategy seldom gives rise to ambivalence: the communicative aspect takes priority.

In contrast with other subjective distortions which we attribute to the psychical state of the characters, reverberation has a special status, since it works directly on the viewer. If I play with a reverberation generator, after a certain amount of time I experience feelings of dizziness and nausea. The separation of the visual and auditory perception of space is significantly different from our normal perception: and this undermines our feeling of security.

Slow Motion

Slow motion corresponds to a phenomenon in our perception of reality. Time is seldom experienced as a static metric, but it is influenced by many

factors such as stress, fatigue, interest, happiness and boredom; time is experienced subjectively as either stretched out or compressed. An exception to this regularity is represented by those moments which we experience as shocking. The flow of information is extremely intense, and yet time seems to stand still.

In most cases, slow motion is reserved for moments of extreme stress. Death in particular has been more often than not represented in slow motion since the beginning of the 1980s. Slow motion appears as an emotional-dramatizing supplement which lies somewhere between added commentary and a seemingly natural distortion of perception. The *death/slow motion* axis is so well established, that slow motion evokes an anticipation of death in the viewer in the presence of acute mortal danger.

Slow motion presents a formal creative challenge to the sound designer. If we slow down the soundtrack, the result is a relatively inexpressive transformation of all frequencies downwards, which can be compensated with *harmonizer-plug-ins*, digital modules in the workstation. But this type of strategy is an exception. It is used primarily with explosions or gunshots, which are generally slowed down to make them seem larger. Far more often, USOs are used – indefinable thundering or rushing noises, which exploit the symbolic dimension of wind and thunder. The sound objects are also selectively reverbed or even faded out. Another typical strategy for the indication of slow motion through sound is *anti-naturalistic selection*, which is covered further below.

The scene in *The Piano* (dir. Campion, 1992), in which George cuts off Ada's finger with the hatchet, employs a multiplicity of techniques. Sounds fade away, Ada's piano playing is heard extra-diegetically – rubato is used in large extent to mimic the disturbing situation – and stops at the moment the finger is cut off. We hear the screams of the daughter, the rain (very muted) and then the very soft sound of Ada's slowed-down steps in the puddles. After a horrified pause, the piano music starts up again, delicate and slow.

Augmentation

When certain sound objects are made to emerge from the sound space, this is called *augmentation*. An aurally acoustically augmented object is distinguished by increased volume, and sometimes distortion emphasizes this distinction by transforming the sound to a lower frequency range. This technique is often coupled with increased reverberation. Technically this is very often achieved by means of a substitution: in other words, the visible object is replaced by the sound of another source.

Augmentation indicates a change in the evaluation of an object or event in the mind of a character. Such augmentation can thus be interpreted as a marked auditory form of subjective transformation. The film brings an important sound object to our attention.

It is significant that this is a late development which occurs for instance in *Lawrence of Arabia* (dir. Lean, 1962) where the reverbed clacking together of tin spoons indicates the hallucinatory exhaustion of the Englishmen in their threatening surroundings.

The procedure then becomes more popular from the mid-1970s, a model example being its use in *All the President's Men* (dir. Pakula, 1975), in which a number of taps of a typewriter are replaced by gunshots. *All the President's Men* describes the events of the Watergate scandal in the form of a political thriller. The gunshots thus serve as a metaphor for the politically explosive power of journalistic research and journalism itself.

Breathing and Heartbeats

The complex of augmentation also includes the audibility of a character's own sounds, especially breathing or heartbeats. These sounds incorporate both simulated and indicated subjective transformations. They are only conceivable as simulations, when the camera takes the point of view of the character as well, so that the optical and acoustic point of view is identical. But such linkages are relatively exceptional. Heartbeats or very intimately recorded breathing are usually used independently of the camera's point of view.

Breathing and heartbeats also have a symbolic dimension. They represent automatic bodily functions, without which no life is possible. They thus indicate not only nearness but, especially in the extremely threatening contexts in which they are most frequently used, life as a value to be protected and as the opposite to death.

In a scene in *Platoon* (dir. Stone, 1986), in which the main character, a young and naïve American who has just arrived in Vietnam, keeps watch, we can experience these considerations in concrete form. At first it is eerily quiet. The breathing sound cuts in prominently during a close up, after which we cut to Chris's view of the moonlit jungle. An indefinable rustling motivates the jump from a close up to an extreme close up, in which only Chris's eyes are to be seen. We then cut again to his point of view, the silhouette of a hidden Vietnamese soldier detaching itself slowly from the surrounding vegetation. Cut back to the extreme close up, the heartbeat sounds in its stereotypical form of a double beat.

As elsewhere, the heartbeat is significantly overstressed. Like many other stereotypes, it is very different from a realistic representation. Normally we only hear our heartbeat in situations of stress or after physical effort through the pulsing flow of the blood in our veins, which corresponds to its speeded up rhythm.

Anti-naturalistic Selection

By *anti-naturalistic selection* I mean a shift in the acoustic processing by foregrounding some of the sound effects and pushing others into the background. This selection simulates the focusing of attention of a character as a function of his specific interests and objectives: for example, the scanning of a sound space for anticipated events, the auditory zooming-in to a sound object as well as focused listening as a correlative of optical focusing.

Anti-naturalistic selection is principally used in films whose entire world is determined or marked by a single character. Consider for instance the fight scenes in *Raging Bull* (dir. Scorsese, 1980). They are formally by no means as homogeneous as they seem. But we can identify a number of basic parameters of their formation. The temporal axis is extremely fluid in all of them. There is no objective temporal metric. Moments of extreme compression with fast, staccato cutting are inter-cut with extended periods of slow motion. The soundtrack is built of a number of sound effects, which partly symbolize the public status of the fights – applause, camera flashes, bells, shouts, whistling and boos from the audience – and partly the physical, material aspect of the body: the highly processed sounds of blows in all their variants, the rushing wind-like noise of the movements and the disgusting squashing noises of bursting wounds. But the essential subjective transformation is created by a number of USOs, from shrill distorted squeaking to swishing or growling sounds. These elements are subjected to continuous change which, added to the flexible description of time, creates a keynote of threatening intensity.

In the shadow of the pompously over-stylized fight scenes, the scenes from everyday life appear more authentic than a closer analysis reveals them to be. The authenticity is strengthened by the depressing lower-middle-class to nouveau-riche settings, as well as by the limited, slurred verbal expression of the characters. The main character appears to be an animal, always driven on by his readiness to fight, imprisoned in his compulsive possessiveness and mercilessly tormented by mistrust and jealousy. The formal creation of these scenes is without flair, the soundtrack – especially the dialogue recording – sounds in part disturbingly bad, and the images often

seem to have been accidentally filmed by a TV reporter. And yet all of this is precisely calculated, and each element of the soundtrack is consciously designed and edited with extreme refinement. Forms of anti-natural selection come up again and again, mostly only perceptible in short significant moments and increasingly centred on the fanatical intensity with which the character observes his prey – the immaculately fair Vickie.

Concluding Remarks

Our investigation of the function of sound effects would indicate an overlapping of semantic and sensory strategies. Both are grounded in film-historical practice and the routine of everyday perception. However, while many of these functions were delegated to the music in the classic Hollywood production, since the 1960s an extremely varied, sensorially rich vocabulary of sounds has been developed. It is a lexicon even capable of constructing the mental attitude of the characters or complex narrative strategies – and thus contributing essentially to our experience of cinema.

Notes

1. Pierre Schaeffer, *Traité des objets musicaux*, Paris: Seuil, 1966.
2. Ibid.; R. M. Schafer, *The Tuning of the World*. Rochester, NY: Destiny Books, 1977.
3. M. Chion, *Audio-vision*. New York: Columbia University Press, 1990.
4. W. Lilli, *Grundlagen der Stereotypisierung*. Goettingen: Hogrefe, 1982, p. 14.
5. See B. Flueckiger, *Sound Design. Die virtuelle Klangwelt des Films*. Marburg: Schueren, 2001, pp. 330–61.
6. Ibid., pp. 192–243.
7. Walter Murch, in Vincent LoBrutto (ed.), *Sound-On-Film: Interviews with Creators of Film Sound*. Westport, CT: Praeger, 1994, p. 85.
8. Ben Burtt, in LoBrutto, V. *Selected Takes*. Film Editors on Editing. New York: Praeger Publishers, 1991, p. 142.
9. Schafer (1977), p. 166.
10. W. Lippmann, *Public Opinion*. New York: Harcourt-Brace, 1922.
11. Ibid., p. 89.
12. P. Wuss, *Filmanalyse und Psychologie. Strukturen des Films im Wahrnehmungsprozess*. Berlin: Edition Sigma, 1993.
13. J. Schweinitz, 'Stereotypen populären filmischen Erzählens', *Arbeitsheft*. Berlin: Akademie der Künste der DDR, 1990, p. 42.
14. Ibid., pp. 10–12.
15. Umberto Eco, *Lector in fibula*. Milano: Bompiani, 1979, p. 114.

16. Th. W. Adorno and H. Eisler, *Composing for the Films*. New York: Oxford University Press, 1947.
17. T. Goschke, 'Lernen und Gedächtnis. Mentale Prozesse und Gehirnstrukturen', in G. Roth and W. Prinz (eds), *Kopf-Arbeit. Gehirnfunktionen und kognitive Leistungen*. Heidelberg: Spektrum-Verlag, 1996, p. 392.
18. Chion (1990), pp. 9–10.
19. Eisenstein et al. in their famous 'Statement': S. M. Eisenstein, V. Pudovkin and G. Alexandrov, 'A Statement', in E. Weis and J. Belton (eds), *Film Sound. Theory and Practice*. New York; Oxford: Columbia University Press, 1928.
20. Eisenstein et al. (1928).
21. Chion (1990), pp. 52–53.
22. Ibid., p. 63.
23. Ibid., p. 5.
24. T. Goschke and D. Koppelberg, 'Konnektionistische Repräsentation, semantische Kompositionalität und die Kontextabhängigkeit von Konzepten', in H. Hildebrandt und E. Scheerer (eds), *Interdisziplinäre Perspektiven der Kognitionsforschung*. Frankfurt/M.: Lang, 1993.
25. Goschke et al. (1993), p. 83.
26. C. Gorbman, *Unheard Melodies: Narrative Film Music*. London: British Film Institute, 1987; K. Thompson and D. Bordwell, *Film Art. An Introduction*. New York: Knopf, 1993.