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Enhanced echoes
Digitisation and new perspectives on film sound

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Abstract

To say that sound has long been a neglected subject in film studies has become something of a commonplace – yet this is no longer true. Starting in the 1980s with a special edition of the journal *Yale French Studies* film scholars have increasingly paid attention to a wide range of issues concerning film sound: dialogue, music, effects, sound design, and silent cinema. Surprisingly however, the processes of digitisation that have radically transformed film production, distribution, and exhibition in the last 20 years have hardly been the subject of attention for scholars specialising in film sound. In this article I will argue that the lack of attention to digitisation in film sound theory is a direct result of the fact that the copy vs. representation debate was already more or less settled before digitisation garnered academic interest. I will introduce the metaphor of the 'enhanced echo' as a different take on the relationship between an original sound and its representation. More specifically, I will use the metaphor of the echo to allow for a new appreciation of the role of the original sound in the transformative process of film sound recording, distribution, and exhibition.

Keywords: digitisation, echo, film, sound, traces

Introduction

To say that sound has long been a neglected subject in film studies has become something of a commonplace – yet this is no longer true. Starting in the 1980s with a special edition of the journal *Yale French Studies* film scholars have increasingly paid attention to a wide range of issues concerning film sound: dialogue, music, effects, sound design, and silent cinema.

The steady output of new monographs and the existence of multiple journals on film sound (such as *Music, Sound and the Moving Image*, and *The New Soundtrack*) are proof of sound's new academic status.

Surprisingly however, the processes of digitisation that have radically transformed film production, distribution, and exhibition in the last 20 years have hardly been the subject of attention for scholars specialising in film sound. This is even more curious when we take into account that the so-called loss of indexical referentiality which has been so central to discussions about the digitisation of the image directly impacts the relation between original and representation or copy – an issue that was central to discussions on film sound theory both in the early days of the sound film and between 1980 and 2000.

In this article I will argue that the lack of attention to digitisation in film sound theory is a direct result of the fact that the copy vs. representation debate was already more or less settled before digitisation garnered academic interest. However, this does not mean that perspectives inspired by processes of digitisation have nothing to add to our understanding of film sound. I will claim that a theorisation of the loss of indexical referentiality *on* the soundtrack points us in the direction of a new conceptualisation *of* the soundtrack. I will introduce the metaphor of the 'enhanced echo' as a different take on the relationship between an original sound and its representation. More specifically, I will use the metaphor of the echo to allow for a new appreciation of the role of the original sound in the transformative process of film sound recording, distribution, and exhibition. It is important to emphasise that this is not a theory of digital sound but rather a theory of film sound inspired by theories on digitisation.

This article has been divided into three sections. In the first section I will discuss the debate in film sound theory about the copy vs. representation distinction. This debate first took place in the wake of the introduction of recorded and synchronised film sound in the late 1920s. After a prolonged period of silence in film sound theory the debate was revisited by film sound scholars in the 1980s and 1990s. By 1992 just before the impact of digitisation was felt in film studies the debate was more or less settled. In the second section I will discuss the subsequent lack of impact that the digitisation of film production, distribution, and exhibition has had on film sound theory and I will take some first steps towards filling that gap. In bringing together theories about the digitisation of the film image developed by Tom Gunning and Lev Manovich with more recent theoretical work on film sound I will lay the foundations for the proposed conceptualisation of film sounds as enhanced echoes.

Bringing in the metaphor of the enhanced echo is not merely a theoretical exercise. In the third section of this article I will suggest that this concept can be of practical use to scholars who are studying the representative quality of film sound, in other words how film sound represents existing (or once-existing) places and situations. I will show how film soundtracks echo not just original sound events but also production practices, technologies, genre conventions, artistic choices, and audience expectations. From this perspective film sound can also be an important source of knowledge about these other dimensions of film. In my conclusion I will stress that theories of digitisation need not only concern digital images or sounds – they can also produce new perspectives or ideas about film or film sound in general. In fact, that is what I intend to demonstrate in this article.

Film sound: Copy or representation?

The introduction of film sound at the end of the 1920s was quickly followed by a number of responses from film theorists and critics, most of them negative. These reactions can partially be explained by the technical quality of the first American sound films. Warner Brothers' earliest sound films like *The Jazz Singer* (Crosland, 1927) and *The Singing Fool* (Bacon, 1928) were produced with the Vitaphone sound-on-disc technology. In this process sound and image were recorded separately on, respectively, a gramophone disc and photographic film stock. When showing a film to an audience the projector was manually synchronised to the gramophone player.[1] Unfortunately, synchronisation was not the strongest point of the Vitaphone technology. Moreover, the gramophone records were prone to wear and tear; repeated use could lead to scratches in the records and thereby to glitches and repetitions in the playback.[2]

On a theoretical level the negative tone of the critical responses can be explained by the dominant idea of what film as an art form ought to be. In the early (or classical) period of film theory there were two main streams of thought: formalism and realism.[3] Formalism was the dominant paradigm in film theory before the Second World War; it was inspired by Gestalt psychology. Gestalt psychologists state that our perception of the world is pre-ordered by the knowledge that we already have of that world. The implication for art theory is that a piece of art can never be a direct imitation of reality because an artist organises and bestows order upon that reality based on his or her own knowledge.[4] Film and photography challenge this assumption because their products appear to be direct, mechanical

imitations of the reality in front of the camera. However, formalist critics argued that film can be art because photographic reproduction always produces a difference between reality and its depiction. For instance, it always turns a three-dimensional environment into a two-dimensional plane.[5] The addition of sound to films (and later colour) was rejected by formalists because it undermined and even destroyed the organisational principles developed in silent film and brought films closer to reality. Film sound thereby rendered film as an artistic form impossible; film could only be art by being distinctly different from reality.[6] Film art, according to the formalists, was essentially visual.

Not all theorists and filmmakers were so negative about film sound; many were eager for experiments with sound and merely disapproved of talkies. Eisenstein, Pudovkin, and Alexandroff argued in their 'Statement on Sound from the U.S.S.R.' in favor of a counterpoint use of film sound; Erwin Panofsky maintained that the potential problem was not sound but speech; and Bela Balasz looked forward to hearing sound montages that would reveal 'our acoustic environment'.[7]

After the Second World War formalism was challenged by realism as a new dominant theoretical perspective. Realism was based on the conviction that the essence of film is its capability of capturing and reproducing reality.[8] Realist theorists therefore showed a greater appreciation of sound. André Bazin, the most influential realist, stated explicitly that 'the primacy of the image is both historically and technically accidental'.[9] There is a remarkable irony in the fact that this appreciation of the relevance of sound in film was followed by a decades-long silence on the subject of film sound theory. Jean-Louis Baudry, one of the most influential writers on film theory in the 1970s, mentioned sound in a throwaway manner: 'it is true that in the cinema ... one does not hear an image of the sounds but the sounds themselves'.[10]

In the meantime the production practices of film sound changed radically in the wake of new technological developments. For instance, the advantages of magnetic tape recording (better sound quality, more channels, and therefore more options in mixing and post-production) were known since the 1940s but they were not used to their fullest potential until Robert Altman made *M*A*S*H* (1970) and *Nashville* (1975).[11] Altman combined the possibility of mixing various channels with the use of small wireless microphones which he pinned to his actors' clothes.[12] As a result the dialogues during the operation scenes in *M*A*S*H* are overlapping and therefore sound realistic.

Another technological development was the introduction of the portable Nagra recorder. This device made it possible for filmmakers to record sounds on location without having to bring in a truckload full of expensive and heavy equipment.[13] This Nagra recorder (a Swiss product) was used in French Nouvelle Vague films of the 1960s, like those of Jean-Luc Godard, and found its way to Hollywood later.[14] Sound designers such as Walter Murch and Ben Burtt employed these new technologies with success. Murch used the possibilities of mixing sound in the post-production of *Apocalypse Now* (Coppola, 1979) in such a way that, in the mind of the protagonist, the sounds of the city of Saigon turned into those of the jungle and the sound of a ceiling fan into that of a helicopter. Ben Burtt used the same technology differently: he created the sounds of alien creatures in *Star Wars* (Lucas, 1977) by mixing various animal sounds.[15] Burtt also used the Nagra recorder; he took it out on a 'hunt' in the vicinity of Los Angeles in order to find sounds that he could use in the creation of the sounds of space ships and other vehicles in the film.[16]

Movie theaters rarely invested in sound equipment in the 1950s; the first stereo systems proved not to be a lasting phenomenon. In the second half of the 1970s Dolby Laboratories developed technologies that offered noise-reduction and surround sound. Movie theaters, especially the new multiplexes, installed these technologies in their auditoria and as a result audiences could actually hear the innovations in soundtrack design of the popular films of these years.[17]

Implicitly and explicitly the movies of the 1970s and their soundtracks became the inspiration for a new group of theorists who engaged with film sound from the 1980s onwards. Implicitly, the innovations in the use of film sound – first in the French Nouvelle Vague and later in Hollywood – led to a new sensitivity for sound, a sensitivity that made it possible to recognise the important role sound plays in film and to develop new theoretical positions. The American film theorist Alan Williams did this in his article in a breakthrough special issue of *Yale French Studies* on film sound when he revealed the falseness of Baudry's observation that 'in the cinema one does not hear an image of the sounds, but the sounds themselves'. Baudry's mistake, according to Williams, was that he considered film sound to be a reproduction of reality rather than a representation, like the image. In Williams' view the material and spatial qualities of a sound recording render each one unique and different from the original.[18]

A similar argument was developed by Rick Altman, who in the last decades has become the leading scholar on film sound. Altman emphasised what he called 'the fundamental scandal' of the sound film – the fact that

image and sound are presented in unity even though in reality they are different phenomena, 'recorded by different methods, printed frames apart on the film, and reproduced by an illusionistic technology'.[19] He compares film with a ventriloquist; the real origins of the sound are hidden in order to maintain the illusion.[20]

I already mentioned that the films of the new directors of the 1970s (and the technological developments that made these films possible) were both implicitly and explicitly an inspiration for new film sound theorists of the 1980s. Implicitly they helped create a new sensitivity for sound that enabled the authors discussed above to develop new theoretical work, but the influence was also explicit. Altman refers extensively to the work of Robert Altman while Coppola's *The Conversation* (1974) is discussed by a number of authors, most notably Michel Chion.[21] Murch was interviewed about his work on *Apocalypse Now* and in turn wrote the foreword to Chion's study *Audio-Vision: Sound on Screen* (1994). Finally, Stephen Handzo has attributed the success of Dolby surround sound to the popular success of *Star Wars*.[22] However, it would be wrong to suggest that only the work of New Hollywood directors found an academic interest; older masters such as Hitchcock, Lang, Bresson, and Godard received their share of attention as well.[23]

This second phase in film sound theory was concluded with the publication of the edited volume *Sound Theory, Sound Practice*. In his introduction to this volume Altman states that the work done in the 1980s was strongly text-oriented and that it is necessary to develop a broader perspective on film sound. Such a perspective – one that would approach film in the context of its material existence in a three-dimensional world – would benefit from a conceptualisation of film as event. 'Film as event' ties together the textual and contextual tradition of film studies, paying equal attention to the texts and the contexts of production and reception:[24]

> [f]loating in a gravity-free world like doughnut-shaped spaceships, cinema events offer no clean-cut or stable separation between inside and outside or top and bottom ... In this three-dimensional Moebius strip world, the textual center is no longer the focal point of a series of concentric rings. Instead, like the pinhole at the center of an hourglass, it serves as a point of interchange between ... the work of production ...[and] the process of reception.[25]

Sound Theory, Sound Practice, with 'film as event' as its central theoretical concept, inaugurated a performative turn in film sound studies. This

performative turn led to a stronger contextualisation and historicisation of film production conditions and film exhibition circumstances. Essential to the concept of the performative turn is a refinement of Williams' observation that every recording of a sound is materially and spatially unique. In one of his chapters in *Sound Theory, Sound Practice* Altman states that the recording of a sound has two 'spatial signatures': the space of recording and the space of playback.[26] This insight has had a number of significant consequences for theoretical work. Sound scholars began to discuss how the spatial relation between the camera and the represented object often differed from the spatial relation between the microphone and a sound source. Basing his argument on discussions among sound technicians published in trade journals in the 1930s, Altman showed how after the introduction of the sound film there were two models for representing the human voice in Hollywood. The first model positioned the microphone near the camera, thereby creating an artificial, anthropomorphic spectator with whom the audience could identify. In this model the sound respected the spatial characteristics of the perspective of the image. However, this came at the cost of dialogue intelligibility. Therefore a second model was developed in which the microphone was positioned closely to the actor and thus did not use the perspective of the image for the sound.[27]

The second phase of film sound theory can be understood as a response to both the neglect of sound in film theory in the 1960s and 1970s and to developments and changes in the sound design of popular film in the 1970s. Like the formalist theorists of the late 1920s and early 1930s the scholars writing on film sound in the 1980s and early 1990s considered film sounds as distinctly different from original sound events, as representations rather than copies. They acknowledged the transformative character of the recording and playback process even before the introduction of digital technologies in film production, distribution, and exhibition. With this in mind we may not consider it very surprising that the introduction of these technologies did not inspire a debate on the ontology of film sound as they did for the ontology of the film image.

Theorising the digitisation of film sound

In 1985 Handzo referred to the use of several digital technologies (each of which has meanwhile grown out-dated) as a development to materialise in the (near) future.[28] Nowadays it is impossible to think of film production, distribution, and exhibition without digital technologies. This development

also forces us to think of film beyond the movie theater; DVDs and the Internet are now often used to see films at home, also to listen to them, given the central role of the sound system in home cinema.[29] However, theoretical reflection on the effects of digitisation in contemporary film culture mainly concerns the image. This is true to such a degree that a widely used handbook in new media studies discusses digitisation only in relation to visual culture.[30] A central theme in this debate is the loss of indexical referentiality. This term refers to the physical connection that used to exist between a photographic image and the object photographed – the imprint left by light on a chemically-treated piece of nitrate or celluloid.[31] The word 'indexical' is derived from the 'index', one of the three types of signs identified by the American semiotician Charles Sanders Peirce. An index is a sign that represents its signified by virtue of a 'real connection' to it.[32] The possibilities offered by digital technologies to create images out of nothing (CGI or computer generated imagery, pioneered for instance in *Jurassic Park* [Spielberg, 1993]), exemplify this loss of indexical referentiality.

The relative lack of interest in digitisation amongst scholars of film sound is, I propose, the result of the already existing realisation since the 1980s that the recorded sound is not an exact copy of an original sound regardless of the existence of indexical referentiality. This had been the subject of the theoretical work done in the 1980s by, amongst others, Williams and Altman. The debate on the question 'Film sound, copy or representation?' was concluded and the answer was undisputed: 'representation'. However, this does not necessarily mean that theories of digitisation can have no value for film sound theory, that the loss of indexical referentiality has had no consequences whatsoever.

So how should we theorise film sound and digitisation? What does the loss of indexical referentiality mean for our thinking about recorded sound? In my view what is at stake here is not necessarily the nature of digitised film sound but the ways in which digitisation can inspire us to think differently about film sound in general. What is interesting is that theories of the digitisation of the film image are not only concerned with digital images but with our notions of what film images actually are, of what cinema actually is and can be. So I ask again: what can the loss of indexical referentiality mean for film sound? How can theories of the digitisation of the image help us figure that out?

In my opinion there are two approaches to this question. The first one denies the importance of indexical referentiality for understanding film at all, even before the introduction of digital technologies. This is a position taken by Manovich and Gunning. The second approach starts from the

argument that referentiality does not necessarily have to be indexical. I will relate both of these approaches to recent theoretical work on film sound by James Lastra and Steve J. Wurtzler respectively.

Manovich has argued that film is the successor of painting, not of photography. Following the introduction of computer generated images in Hollywood action films Manovich claims that live action film is but one component of digital filmmaking; other elements are computer animation, painting, compositing, and image processing, all of which do not rely on indexical referentiality.[33] Gunning takes the argument one step further by suggesting that the concept of indexical referentiality offers a very limited understanding of Peirce's semiotic system; according to Gunning this is not very useful for understanding film as a realist art form.[34] In a conscious and deliberate reference to pre-1960s essentialism he proposes that the defining characteristic of film is motion. This is more a phenomenological than an ontological claim, as he emphasises the importance of the experience of motion. Rather than arguing for a realist aesthetic, as Bazin would have done, he offers a 'theory of the impression of reality'.[35]

The question now is how these arguments relate to film sound. I would suggest it is instructive to link up the work of Lastra with these positions regarding the digitisation of film, even though Lastra discusses the early history of sound recording technology. On the subject of film sound as a representation of an original rather than a reproduction, Lastra mostly agrees with Williams and Altman.[36] He labels these scholars as 'non-identity theorists' because they view the original sound and the recorded sound as not identical. However, he criticises them for suggesting that there is such a thing as an original sound in the first place.[37] Lastra argues that even in the presence of an original sound event, for instance a classical concert, the position taken in by the listener is already one position out of many possible ones and that another listener at another place in the same concert hall hears a different concert, in a strictly material sense.[38] This is an argument already inherent in Altman's discussion of the construction of sound space in film, but Lastra makes it explicit and theorises its implications. Lastra suggests that we should not think of film sound in terms of the tension between the original (which in his opinion has never existed) and the copy, but rather regard it as a process similar to that of writing. By thinking about sound as writing we can focus on 'effects' of authenticity and immediacy as produced by film technique and technology.[39]

In my opinion Lastra's theory can be understood to correspond to Gunning's argument. Both move away from the original/copy issue to focus on the production of realistic experiences.[40] The digitisation of film does not

force us to account for the loss of indexical referentiality in image and sound but allows us to think of all film – analogue and digital – as processes that aim to produce reality-effects. Most importantly, Gunning emphasises the experience of motion by the audience as the defining characteristic of cinema rather than the representation of motion. He stresses the importance of the audience's participation in the filmic experience and thus acknowledges the significance of the space of the exhibition of film – its second spatial signature.[41] The one comprehensive work on film sound in the digital era, Mark Kerins' *Beyond Dolby* (*Stereo*), also focuses on this space. Kerins shows how the new technology of digital surround sound enables filmmakers to 'place' sounds in the auditorium, around the audience, thereby creating new spatial relations between image and sound. These new relations sometimes break with the conventional continuity system of popular cinema but nevertheless confirm the unity of the represented space.[42]

This approach to film sound in the digital age, emphasising reality-effects and the participatory experience of film, is interesting yet not sufficient in my opinion. A realistic experience and the reality-effect still rely on a correspondence to the 'real' world, at least as it is imagined by the makers and the audience. This is especially important for films which are set in existing or once-existing locations. It might well be misleading to think of original sounds and copies or to rely too heavily on the concept of indexical referentiality but there is a relation between modern or historical soundscapes and their representations in film. This relation is absent from Lastra's theory. A more productive way to think of film sound, for this study at least, comes from an observation by Gunning. If to my mind it seems a crucial insight he unfortunately does not pursue it any further. He argues that in film studies the index has been largely abstracted from Peirce's semiotic system and is simplified. There are other types of signs, argues Gunning, and furthermore: 'Peirce ... by no means restricts the index to the impression or trace'.[43]

Peirce distinguished between three types of signs in his system of semiotics: index, icon, and symbol. As mentioned earlier, an index refers to its signified because it has a real connection to it. For instance: smoke signifies fire. An icon is a sign that references its signified because of a formal resemblance between the sign and the signified, like recognising that it is a woman that has been painted from her resemblance with women. Finally, the relation between a symbol and its signified rests entirely upon cultural convention.[44] An example would be a red traffic light, which signals 'Stop!' When film scholars, following Bazin, mentioned the indexical referentiality of film and photography they always referred to the material trace left

on the celluloid by the combination of chemicals and exposure to light. However, Gunning offers a wider interpretation of Peirce's semiotic system. According to Gunning the index can be anything that focuses attention.[45] We can imagine that a person in the street pointing up at a flying Superman functions as an index, even though there is no real connection between the two. The lesson that we can learn from Gunning's wider interpretation of Peirce's semiotics is that films and film sounds can directly signify the real world without there being a physical relationship between the representation and the represented object, the pro-filmic event.

A similar argument can be read in Steve J. Wurtzler's book *Electric Sounds: Technological Change and the Rise of Corporate Mass Media*. He grasps the two opposing models of constructing sound space in fiction film which were previously discussed by Altman as models of transcription and signification. The former model presupposes the reproducibility of the sound event and the latter model suggests the creation of a new sound perspective which 'signifies' the diegetic world.[46] Wurtzler argues that all sound media have been marked by tensions between these two models and, equally important, that the eventual conventional model for creating sound space in fiction film was not a victory of one model over another but instead a fusion of the two models into a new one that simulated the perception of a sound event.[47] Wurtzler calls this fusion model 'signifying fidelity':

> [t]his model for acoustic representation sought to use the creative potential of electrical sound technology to signify a mimetic relationship to an (often nonexistent) original sound event.[48]

Wurtzler's model is one that acknowledges the constructivist character and the creative potential of film sound as well as its mimetic relationship to an original sound event – but there lies a problem in that last term. Wurtzler suggests that it is not only possible but that it is common practice in the film industry to create one-sided mimetic relationships; relationships in which a sign mimics or resembles something that never existed. I argue that any mimetic relationship – or iconic relationship, in Peirce's terms – requires the existence of a sign as well as a signified. That the sign (i.e. the film sound) is not an exact copy or reproduction of the signified (the original sound event) is only the logical conclusion of the recording process, as Williams already pointed out in 1980. But in a mimetic relationship a film sound has to signify something, somehow. Hence, I arrive at my own contribution to this discussion.

Film sounds as 'enhanced echoes'

My contribution to this debate is the proposition to use the metaphor of the echo to conceptualise film sound's representative qualities and its relation to original sound events. This is not so much an ontological argument as it is an effort of (re)capturing the semiotic status of the recorded sound. I do not employ the metaphor of the echo in order to state what film sounds are but rather to better understand what they do.

In Greek mythology Echo is the name of the nymph who was stripped from her own voice and could only repeat the last sounds of words spoken by other persons. *The Oxford English Dictionary* defines 'echo' as follows:

> [a] repetition of sounds, which is produced by the reflexion of the sound-waves due to their incidence on something denser than the aerial medium in which they are propagated; hence concr. a secondary or imitative sound produced by reflected waves, as distinguished from the original sound caused by the direct waves. (OED)

This definition contains three important characteristics. First, the echo is a temporal and a historical phenomenon, it is a repetition of sounds. On film soundtracks sounds are recorded so that they may be heard again, repeated later. This 'later' may be a week, a year, or even decades. Second, the echo has a material dimension. It is produced by the incidence of a sound wave on a material denser than air and it is reflected from that material. Whether film sound is recorded optically (on photographic stock), on magnetic tape, or digitally, these materials return the sound to the world. The specifics of particular material circumstances during recording, mixing, and playback influence how the echo sounds, which leads me to the final characteristic: an echo is notably different from the original sound while it is at the same time necessarily tied to it.

The 1931 film adaptation of Alfred Döblin's novel *Berlin Alexanderplatz*, by Phil Jutzi, offers a good illustration of how film sounds can be understood to echo a (once) existing soundscape. The scene in which the main character, Franz Biberkopf, works as a street hawker at Alexanderplatz was filmed at the Babelsberg studios where the square and its surrounding streets were painstakingly recreated. Filming on location was considered impractical because the early sound equipment would not pick up the actors' voices in the din of the surrounding city noises.[49] In order to represent these noises in the final product Jutzi did use recordings of traffic on the actual Alexanderplatz.[50] What is the semiotic status of these sounds? Obviously

these recordings do not offer an exact copy of Berlin's sounds, but they are a repetition of them, reflected – metaphorically speaking – by the material surfaces of the microphone, the photographic stock, my *Berlin Alexander-platz* DVD, and the speakers of my laptop. In the process of being reflected the sounds have been transformed and yet they are still recognisably the sounds of a city square with busy traffic. There is no question of indexical referentiality in the classic sense but these sounds do *point at* something, i.e. the original sound events of a once-existing location.

The metaphor of the echo also has its limitations and must therefore not be taken too literally. First, the word echo can suggest to the reader a weaker or weakened sound, a lesser sound than the original – a faint or almost inaudable repetition. In contrast I propose to think of the echo as a transformed sound, an intentional variation on an original. Moreover, in order to emphasise the creative work done by filmmakers and to make clear that film sounds are in no way less significant than their originals, I shall speak of 'enhanced echoes'.

To be sure, I am not the first to use the metaphor of the echo to con-ceptualise the film soundtrack. In 1999 the French film scholar Véronique Campan already proposed thinking of film sounds as echoes in order to distinguish between the original sound and its recording. Campan states that the original sound leaves traces in the recording and that these traces can never entirely correspond to the film image. Campan hereby recognises that because image and sound are often recorded separately and because a sound in film is not necessarily the sound it signifies, the traces left by a sound on the soundtrack do not necessarily correspond to anything in the image.[51] Campan's argument is inspiring because it recognises the importance of the original sound. However, she directs her attention to the perception of these echoes by the audience in the auditorium – to the experience of film sound. My interest is in a different aspect of film sound: what do these echoes – these transformed sounds – signify? There are a number of answers to this question.

Film sound can be understood to echo a sound event that took place on set or on location during the filming of a scene. This can be dialogue, a sound effect, or ambient noises. Production practices in the film industry have developed in such a way that a film soundtrack only echoes those sound events that are considered necessary or appropriate for the scene. When filming in a studio the filmmakers have considerable control over the sound events that occur but on location some extra measures are neces-sary to secure the recording of the 'proper' sounds. Dutch sound designer Ben Zijlstra explained in an interview the common practice of recording

a few minutes of 'room tone' on location to be used during mixing and editing.[52] Without these background sounds a scene would not sound 'real' to the audience. However, 'real' does not mean 'exactly as the real place'. Zijlstra also stressed that the passing of a tram around the corner – or any other unexpected sound – would ruin his room tone recording. For the same reason, in the early days of the sound film when filmmakers worked with heavy equipment and expensive film stock the simple passing over of an airplane could lead to considerable stress. Dutch actor Sylvain Poons recalled his work on the set of *De Jantjes* in Amsterdam in 1934:

> [t]hey had closed off the entire Brouwersgracht, tying ropes to the trees ... and several thousands of people stood there watching. They had never seen anything like it. At that point Mr. Benno [the film's writer and producer] be-gan to talk through his megaphone: 'Ladies and Gentlemen, we are making the first Dutch sound film here, De Jantjes, and we ask you for your complete silence, as every meter [of film] lost will cost thousands and thousands of guilders.' If a bit exaggerated, everyone was dead silent right away. Next, we rehearsed a scene eight, ten, twelve times, in beautiful weather, and just as we started the recording, a plane flew over our heads, at 2000 meters, and they weren't as quiet then as the ones today. Benno nervously threw his hands up in the air shouting: 'GO, GO, GO!' Suddenly we had an uproar.[53]

What this example shows is that film soundtracks do not only echo sound events but also production practices and the technologies under use. Whether a film is shot in a studio or on location, what type of stock is used, which microphones, all these decisions and practices (and many more) leave their traces on the soundtrack – they become part of the echo. Sometimes these decisions are practical, sometimes they reflect the preferences of the filmmaker, and sometimes they are part of genre conventions; for instance, when the roar of big city traffic in London is muted in romantic comedies or replaced by recognisable pop melodies.[54] As a result one could argue that a city or a town represented in a film does not sound 'like the real thing'; that the soundtrack no longer bears a mimetic relationship to an original, or, in the line of argument pursued by Lastra and Wurtzler, that the original sound event does not exist. However, there does exist a more satisfactory explanation.

Sound designer David Sonnenschein argues (in relation to ambi-ent sound, but it applies to all elements of the soundtrack) that what is important in filmmaking is that sounds speak to the idea audiences are thought to have of the place and time in which the film is situated.[55] For

instance, soundtracks do not necessarily echo the sound of London but rather the idea of the sound of London in particular (generic) circumstances. A gunshot in a film does not have to sound like a real gunshot but it needs to conform to the audience's expectation of what a gunshot sounds like. These expectations can be based on real experiences but equally as much on the representations of a sound in other texts: films, radio plays, television shows, descriptions in books even. In turn, the sound of the gunshot itself contributes to the shaping of this expectation; it reinforces or challenges it. The gunshot is an echo, a repetition of a sound, slightly different each time, but still recognisable.

Conclusion

My argument in this article stems from a dissatisfaction I felt with non-identity theory, as Lastra calls it. His line of argument resulted in the statement that there are no original sounds and that we must direct our attention to the way film sound creates realistic experiences. I certainly agreed with the latter part of that argument but I kept wondering, when watching and listening to a film how do I recognise the experiences I have as realistic? A film sounds realistic because I recognise a sound, because I have heard it before; because it is a repetition of what I have heard in previous films, on television, and also on the street; because there is a mimetic relationship with an often existing original. The echo as a metaphor for that mimetic relation allows us to place the original sound back into the transformative process of film sound recording, distribution, and exhibition.

The metaphor of the echo can actually help us to open up the 'black box' of this transformative process. As I have demonstrated, film soundtracks also echo production practices and the technologies and materials used. I briefly mentioned how they can echo genre conventions or artistic preferences and choices by the filmmaker. Finally, I proposed that understanding film sounds as echoes also allows us to hear these sounds as representations of ideas and expectations about sounds. If we accept that in a mimetic relationship between a film sound and something else that something else does not have to be one original sound event, or – in plainer speech – that a film sound can echo much more than only a supposed original sound event in front of a microphone, then the film soundtrack can become a treasure trove of knowledge about film history, technology, and culture.

The soundtrack can also echo a particular representation of sound in another medium. The film *Berlin Alexanderplatz* (Jutzi, 1931) does not only

echo the sounds of Berlin but also the descriptions of these sounds by Alfred Döblin in the original novel, and it in turn was echoed by Rainer Werner Fassbinder's television series.[56] More generally, mediated representations of urban soundscapes echo popular and societal notions about modern city life.[57]

I suggested that theories of the digitisation of film images do not only concern digital images but that they also challenge our basic notions of what film images actually are. The same is true for sound. The theorisation of the digitisation of film sound does not only provide a theoretical account of digital sounds but also opens our mind and our ears to a different perspective on film sound in general. I suggested that the digitisation of film sound has gone under-theorised the last 20 years because digitisation seemed to pose questions that film sound scholars had already satisfactorily answered. However, as I hope to have convincingly argued here, the loss of indexical referentiality that characterises digitisation does not simply underline film sound's status as a constructed representation. This loss invites us to further investigate the various ways in which the film soundtrack can represent or signify sound events, practices, and ideas. The proposed enhanced echo model of sound covers these various means of representation and signification.

Sound is often positioned vis-à-vis vision as fleeting or elusive. A picture captures a moment and preserves it over time, whereas a sound starts fading away the very moment it is produced. Sounds do not disappear in a vacuum though. In their echoes we can hear where they came from and what they mean or one day meant. Echoes are the traces that sounds have left behind.

Notes

1. Handzo 1985, pp. 385-386.
2. Ibid., p. 386.
3. Andrew 1976, pp. 11, 104.
4. Ibid., pp. 55-59.
5. Ibid., p. 12; Arnheim 1974 (orig. in 1932), pp. 28-29.
6. Andrew 1976, p. 35; De Putter 1991, p. 186.
7. Aalbers 2013, pp. 28-29.
8. Andrew 1976, pp. 137-141; De Putter 1991, pp. 194-198.
9. Bazin 1974 (orig. in 1958), pp. 88-89.
10. Baudry 1986 (orig. in 1975), pp. 304-305.
11. Kellogg 1980 (orig. in 1955), pp. 215-216; Altman 1980, pp. 9-10.
12. Altman 1980, pp. 9-10.
13. Whittington 2007, p. 31.

14. Ibid., pp. 58-59.
15. Ibid., p. 25.
16. Ibid., p. 32.
17. Handzo 1985, pp. 418-425.
18. Williams 1980, pp. 51-53.
19. Altman 1980, p. 79.
20. Ibid., pp. 76-79.
21. Chion 2009, p. 289.
22. Handzo 1985, p. 423.
23. Weis & Belton 1985, pp. v-viii.
24. Altman 1992a, pp. 1-2.
25. Ibid., p. 3.
26. Altman 1992b, pp. 23-28.
27. Altman 1992c.
28. Handzo 1985, p. 424.
29. Nowell-Smith & Thomas 2003, p. 6.
30. Lister et al. 2003, pp. 97-163.
31. Bazin 2004 (orig. in 1946-57), p. 13.
32. Peirce 1998 (orig. in 1909), pp. 460-461.
33. Manovich 2010 (orig. in 2001), pp. 245-254.
34. Gunning 2010 (orig. in 2007), pp. 256-258.
35. Ibid., p. 265.
36. Lastra 2000, pp. 124-128.
37. Ibid., p. 150.
38. Ibid., p. 151.
39. Ibid., pp. 152-153.
40. One would expect to see a reference to or discussion of Walter Benjamin's 'The Work of Art in the Age of Mechanical Reproduction' in Lastra's chapter on sound theory. Curiously, there is none. Nor is Benjamin's work mentioned or referred to in Williams' article or any of Altman's articles and chapters referred to in this essay.
41. Gunning 2010 (orig. in 2007), pp. 265-267.
42. Kerins 2010, pp. 109-111. The continuity system is a concept that is used to refer to the organisation of cinematic pace in classical Hollywood cinema. Bordwell & Staiger & Thompson state that: 'the basic purpose of the continuity system is to create a smooth flow from shot to shot' (Bordwell & Staiger & Thompson 2001 [orig. in 1985], p. 262). By presenting the cinematic space through camera positioning as unified and continuous the filmmakers make it possible for the audience to follow the narrative without being disturbed by changes in the camera position between shots.
43. Gunning 2010 (orig. in 2007), p. 256.
44. Peirce 1998 (orig. in 1909), pp. 460-461.
45. Peirce quoted in Gunning 2010 (orig. in 2007), pp. 255-256.
46. Wurtzler 2007, pp. 229-231.
47. Ibid., pp. 268-278.
48. Ibid., p. 18.
49. Rehhahn 1996, p. 222; Vogt 2001, p. 252; Braunger 2008, p. 28.
50. Braunger 2008, p. 40.
51. Campan 1999, pp. 23-25.
52. Personal interview with Ben Zijlstra on 26 January 2011.

53. Poons quoted in Van Gelder 1995, pp. 11-12. 'De Brouwersgracht was helemaal afgezet, met touwen tussen de bomen ... en er stonden enige duizenden mensen te kijken, dat hadden ze nog nooit gezien. Toen ging meneer Benno een toespraak houden door zijn megafoon: mijne dames en heren, we maken hier de eerste Nederlandstalige film met geluid, *De Jantjes*, en wij verzoeken u doodse stilte te bewaren, aangezien iedere meter die verloren gaat, duizenden en duizenden guldens kost. Tikkie overdreven, maar het was meteen doodstil. Dan wordt zo'n scène acht, tien, twaalf keer gerepeteerd, doodstil, prachtig weer, en we zijn net met de opnamen begonnen, komt er op 2000 meter hoogte een vliegtuig over, en ja, ze waren niet zo geluidloos als nu, waarop Benno in zijn zenuwen met zijn handen in de lucht WEG, WEG, WEG, begint te roepen. Het was een tumult ineens.'
54. Aalbers 2013, pp. 131-132.
55. Sonnenschein 2001, p. 38; Watters quoted in Sonnenschein 2001, p. 207.
56. Fickers et al. 2013.
57. Aalbers 2013, p. 15.

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