

Florian Heesch

Voicing the Technological Body: Some Musicological Reflections on Combinations of Voice and Technology in Popular Music

2016

<https://doi.org/10.25969/mediarep/19431>

Veröffentlichungsversion / published version

Zeitschriftenartikel / journal article

Empfohlene Zitierung / Suggested Citation:

Heesch, Florian: Voicing the Technological Body: Some Musicological Reflections on Combinations of Voice and Technology in Popular Music. In: *Journal for Religion, Film and Media*. "I Sing the body electric". Body, Voice, Technology and Religion, Jg. 2 (2016), Nr. 1, S. 49–69. DOI: <https://doi.org/10.25969/mediarep/19431>.

Erstmalig hier erschienen / Initial publication here:

https://www.jrfm.eu/index.php/ojs_jrfm/article/view/52

Nutzungsbedingungen:

Dieser Text wird unter einer Creative Commons - Namensnennung - Nicht kommerziell 4.0/ Lizenz zur Verfügung gestellt. Nähere Auskünfte zu dieser Lizenz finden Sie hier:

<https://creativecommons.org/licenses/by-nc/4.0/>

Terms of use:

This document is made available under a creative commons - Attribution - Non Commercial 4.0/ License. For more information see:

<https://creativecommons.org/licenses/by-nc/4.0/>

Voicing the Technological Body

Some Musicological Reflections on Combinations of Voice and Technology in Popular Music

ABSTRACT

The article deals with interrelations of voice, body and technology in popular music from a musicological perspective. It is an attempt to outline a systematic approach to the history of music technology with regard to aesthetic aspects, taking the identity of the singing subject as a main point of departure for a hermeneutic reading of popular song. Although the argumentation is based largely on musicological research, it is also inspired by the notion of presentness as developed by theologian and media scholar Walter Ong.

The variety of the relationships between voice, body, and technology with regard to musical representations of identity, in particular gender and race, is systematized alongside the following categories: (1) the “absence of the body,” that starts with the establishment of phonography; (2) “amplified presence,” as a signifier for uses of the microphone to enhance low sounds in certain manners; and (3) “hybridity,” including vocal identities that blend human body sounds and technological processing, whereby special focus is laid on uses of the vocoder and similar technologies.

KEYWORDS

recorded popular song, gender in music, hybrid identities, race in music, presence/absence, disembodied voices

BIOGRAPHY

Dr. Florian Heesch is professor of popular music and gender studies at the University of Siegen, Germany. He holds a PhD in musicology from the University of Gothenburg, Sweden. He published several books and articles on music and Norse mythology, music and gender and on diverse aspects of heavy metal studies. His research interests include intermedia transformations of literature and myths, popular music and religion, Scandinavian literature and music, and 20th- and 21st-century music history.

The singing voice, it seems, is more connected to the human body than is any other musical sound. It is produced with body movements only, mainly inside the body, and as a result of using many smaller and larger body parts, including physical cavities, the voice is characteristic of the individual person and his or her body. Roland Barthes expressed that relationship vividly in his path-breaking essay “The Grain of the Voice”, in which he stated that perceiving the “grain”, which is “the body in the voice as it sings”, is “to listen to my relation with the body of the man or woman singing or playing and that relation is erotic”.¹ However, it would be misleading to think of today’s human voices as a resort of “natural” or even “primordial” sounds. On the contrary, speech and singing, like any other bodily action, interact constantly with the culture we live in, including its notions and knowledge about vocal identities (for instance, how male and female voices sound) and the versatile and inescapable interactions with technology (for instance, in telephone conversations or in listening to radio, television, or online video clips). Most of the musical voices we listen to today arrive in our ears not directly from other bodies but from technological devices like speakers or headphones, and in many cases these sounds are not only transmitted but also transformed by technology.

The musical voice as a hybrid of bodily and technological sounds is in particular connected to the history and culture of Euro-American popular music. Popular music as a mass-culture phenomenon is based on the development of sound recording and distribution through the gramophone around 1900; the younger phenomenon of popular music as youth culture, the occurrence of “pop” with an emphatic meaning, was facilitated by the development and marketing of relatively affordable devices like the transistor radio and lighter variants of the turntable.² Young people were enabled to listen to their musical idols, even if they could not afford to attend their concerts. As listening to radio programmes, records, and, later, video clips became a crucial part of popular music culture, people became used to listening to electronically transmitted and transformed voices. This technological hybridity of the musical voice can be described as no less than the standard in popular music.

Still, one of the basic questions raised by listening to popular song is directed at the singing subject. Whose voice is it? The musicologist Allan Moore emphasises that the identity of the singer is generally the aspect with which people are principally concerned as they listen to a track and therefore “the central aspect of the interpretive process”³; put another way, that very identity plays a key role in any hermeneutic approach to recorded popular song. It is important to note that Moore approaches the identity of the singer carefully, by introducing the concept of persona, an “artificial construction that may, or may not, be identical with the person(ality) of the singer”,

1 Roland Barthes, “The Grain of the Voice”, in Barthes 1977, 182.

2 For a detailed overview of these large socio-musical developments see e.g. Middleton 1990, chapter entitled “Forces and relations of production (I)”; Wicke 2001.

3 Moore 2012, 178.

whereby he refers to previous concepts of performance in popular music developed by Simon Frith and Philip Auslander.⁴ While these authors refer to concepts of dramatic performance, Suzanne Cusick, another musicologist, follows Judith Butler's theory of performativity, which implies that identities are never fixed but are constituted by perpetual performances.⁵ Cusick, too, focuses on audible aspects of performances, by asking how gender and sexual identities can be analysed in vocal sounds. However, like Moore, she focuses on sounds produced by the body. The question remains as to the extent to which the regular hybridity of technologically transformed voices affects our readings of popular tracks.

I think it worth looking at what we can learn by combining a hermeneutic approach to identities in recorded popular song with insights from the history of technology in music production. A variety of technological practices influence what we perceive as a musical voice – from the sheer practice of phonography via the use of microphones and amplifiers to more complex vocal transformations that result from the use of vocoders and similar machines. Important strands of these technological developments have already been studied and interpreted, in part even with regard to questions of musical identity and in part in combination with aesthetic analysis. Scholars like Susan McClary and Alexander Weheliye have emphasised the relevance of technology with regard to vocal representations of gender and race respectively.⁶ These aspects of identity, both very significant for constructions of popular musical personae, are stereotypically associated with certain vocal sounds as well as with certain uses of technology. Moreover, as can be concluded from McClary's and Weheliye's analyses, hybrid sounds of bodily and technologically produced voices may potentially challenge culturally established dichotomies like male/female or black/white. Such voices may thus be listened to as audible examples of the performativity of identity. What has rarely been attempted, however, is a systematic overview of diverse combinations of voice and technology in popular song with regard to constructions of identity as well as their musically aesthetic aspects. Miriama Young's book *Singing the Body Electric: The Human Voice and Sound Technology*, the most recent and most comprehensive study within the field, addresses some central aspects of this research question, naturally giving them much more space than a single article can provide.⁷ Although Young's insights are highly interesting for the present article, she is less concerned with popular music or with aspects of gendered or ethnic identity.

In the following, I will provide a necessarily short overview of voice-technology combinations in popular song with regard to musical representations of identity. Gender identities, for instance, have been delineated in many different ways in music through gendered participation in different musical practices – for example, in Euro-

4 Moore 2012, 178; see also Frith 1998; Auslander 2009.

5 Cusick 1999.

6 McClary 2002; Weheliye 2002.

7 Young 2015.

American culture women have been accepted as singers rather than as users of technology.⁸ However, my main concern here is with representations of identity in music, following hermeneutic approaches to musical aesthetics like those of Moore and McClary.⁹ I am looking for possible readings of technologically and bodily produced sounds as utterances from certain – or rather, uncertain – subjects whose identities can be constructed within the hermeneutic process.¹⁰ A focus is directed at the relationship between the body and central historical developments in the technology of music production.

Although this study clearly addresses a musicological question and adopts a musicological perspective, it benefits from the concept of presence as developed by theologian and media scholar Walter Ong. Ong theorises sound, vocal sound especially, in its relationship to the experience of other subjects in a way that can be fruitful for a hermeneutic approach to the identity of the singer. In this regard, presence is the crucial factor: “Sound, bound to the present time by the fact that it exists only at the instant when it is going out of existence, advertises presentness. It heightens presence in the sense of the existential relationship of person to person.”¹¹ What is interesting for the purpose of this essay is the notion that vocal sound implies the presence of another subject, a concept that seems to be in sync with Moore’s observation on the general importance of the singer’s identity for song interpretation. Interestingly, Ong stresses the relevance of vocal presence even for recorded voices: “Even the voice of one dead, played from a recording, envelops us with his presence as no picture can.”¹²

Jonathan Sterne is certainly right when he criticises Ong’s writings on sound as based on universal assumptions for audible experience and on a rather simplistic dualism of audible and visual cultures.¹³ However, I consider the concept of presence helpful for an approach to vocal identities. The point is not to essentialise sound in general and the body as producer of vocal sounds in particular as universal or natural qualities. Presence is interesting because it helps to categorise relationships of body and technology that manifest themselves in certain representations of identity in music, and hence also in individually aesthetic ways. I will argue for different types

8 Cf. Dibben 2002, 121.

9 Regarding gender, Dibben (2002, 121) distinguishes representations in music from other musical constructions of gender identity, like the “typing of musical performance and composition”, “musical taste”, and “remembering and collecting”.

10 It is less important here to decide whether we should talk about representations or performances of identity. Butler’s concept of performativity has been interpreted as more flexible than the concept of representation that is connected to the rather fixed idea of an image (cf. von Hoff 2005). However, performance is so closely connected to the body that it would be rather confusing to subsume all technological transformations of bodily produced voice sounds as well. I prefer to denote the audible hybrid song as a representation of a more or less hybrid identity.

11 Ong 1981, 101; like Young 2015, 20. I think Ong is still relevant for the discussion of sound and voice, even though there are also more recent studies on presence; see for instance the overview Ernst/ Paul 2013.

12 Ong 1981, 101.

13 Sterne 2003, 16–19.

of presence and for presence as an aesthetic category. To that extent, my use of the term “presence” extends that of Ong.

In the following I will argue that the historic development of recorded popular song includes relationships between body and technology that can be described alongside concepts of presence, absence, and hybridity. These concepts will prepare the ground for systematic categories of phenomena of voicing technological bodies in the history of popular music: (1) absence of the body: recorded voices, (2) amplified presence: microphonic bodies, and (3) hybrid identities: vocoders and other technologies of vocal transformation. In my view, this classification extends beyond the too-familiar borders between, for example, rock and pop, pop and popular music, even popular and classical music. I approach that field through observations on select pieces from the history of popular music, from early twentieth-century schlager to today’s pop music by Lady Gaga. The approach via examples illustrates genre-crossing and, furthermore, allows me to include close readings (with a focus on the recent example of Lady Gaga) that can shed light on how a hermeneutic approach to such phenomena might work.

ABSENCE OF THE BODY: RECORDED VOICES

Strictly speaking, the history of the absence of the singing body in music due to technology starts with the transcription of song. Although that aspect is too complex to be dealt with comprehensively in this article, it is important to keep in mind that scholars and music publishers were already collecting traditional songs such as African American spirituals in the nineteenth century. In those early years the perceived melodies were transcribed by the use of musical notation, producing a visual representation of voices in the absence of singers. In the case of the spiritual, the technological appropriation of absent black bodies by white audiences is directly connected to the marginalisation of African Americans in American culture and society.¹⁴ This aspect has heavily influenced the history of globalised popular music and will therefore occur again later in this article.

With the emergence of sound-recording technologies at the end of the nineteenth century, it became possible to listen to “disembodied voice[s]”,¹⁵ the voices of absent singers. Two different sound technologies, both developed in the United States, competed for the first place in a now-globalised industrial world: Thomas Alva Edison’s phonograph and Emile Berliner’s gramophone.¹⁶ Contemporary commentators on the phonograph expressed their fascination with listening to the voices of absent people. For instance, Field Marshal Helmuth von Moltke, a member of the elite public for Edison’s product presentations in Germany in 1889, commented vividly on the

14 Cf. Weheliye 2002, 28.

15 Laing 1991, 7.

16 Cf. Gauß 2009; Osborne 2014.

recorded voice of Chancellor Otto von Bismarck: “The phonograph enables a man who has been resting in his grave for a long time to lift his voice once again and salute the present age.”¹⁷ Because Bismarck was still alive at the time, von Moltke’s comment was clearly a vision for the future, and, indeed, it was soon possible to hear recorded voices of absent (dead) bodies. Similarly, in his history of the vinyl record Richard Osborne argues that “sound recording promises immortality ... it is a form of cryogenics, preserving life in order to reanimate it at another time”.¹⁸ Ong’s statement on the presence of dead bodies in recordings of their voices clearly resonates with these observations.

Finally, it was not the phonograph but the gramophone that won the competition between the two recording technologies. Its success was due in part to some technological advantages but above all to Berliner’s strategy of commercialising his apparatus not for communication purposes, as Edison had in mind, but for entertainment, which included the recording and distribution of music. In the German context, the schlager genre profited heavily from the new technology. When the gramophone became increasingly popular in bourgeois homes in the late 1920s, some schlager even reflected that new popularity, for instance, “Ich hab zu Haus ein Grammophon” (“I’ve got a gramophone at home”), sung by Max Kuttner (1883–1953), which included the following chorus:¹⁹

Ich hab’ zu Haus’ ein Gra, ein Gra, ein Grammophon,
das macht so schön Trara, Trara, Sie wissen schon.
Man steckt die Nadel rein,
gleich fängt es an zu schrei’n.
Die größte Sensation,
das ist mein Grammophon.

I’ve got a gramophone at home,
that nicely says trara, you know.
As soon as you put the needle in
it starts to scream.
My gramophone
is the greatest sensation.

Like many other pieces from urban cabaret culture, “Ich hab zu Haus ein Grammophon” combines the depiction of new technology – a technology that is so new that its owner rather stammers its name – with erotic allusions. In this case, the phrase “Man steckt die Nadel rein” (“you put the needle in”) offers associations with phallic

17 “Der Phonograph ermöglicht, dass ein Mann, der schon lange im Grabe ruht, noch einmal seine Stimme erhebt und die Gegenwart begrüßt”, cited in Gauß 2013, 31, English translation F.H.

18 Osborne 2014, 22.

19 Kuttner, Max, Ich hab zu Haus ein Grammophon, Schlager Medaillons 4, Membran Music 2004, English translation F.H.

sexual intercourse, the more so as the verses are about stereotypical “boy meets girl” situations. Although this reading may seem bawdy, it picks up on a genre-typical combination of technology and eroticism that can similarly be heard in another schlager recorded by Kuttner, “Die schöne Adrienne hat eine Hochantenne” (“The beautiful Adrienna has an elevated antenna”). Even the blurring of traditional gender differences, sometimes heavily transgressive, became part of schlager culture. As Anno Mungen has demonstrated, gramophone recordings of the 1920s could emphasise the queer practices of cabaret artists like Kuttner or Paul O’Montis precisely because of the technological disembodiment of the voice.²⁰ The absence of the singing body from a gramophone recording emphasised the possibly unclear identification of the singer’s gender and sexuality.

The next important step in the history of recorded music was certainly primarily economic, namely the emergence since the 1950s of affordable music technology like transistor radios and of “teenagers” as a new youthful group of buyers. The evolution of post-war youth culture, with rock’n’roll as one of its main characteristic practices, is strongly linked to the distribution and use of affordable music technology. As early as the 1920s, recordings had offered the opportunity to listen to stars of the time, like Enrico Caruso, to a relatively large group of people, even though they could not afford tickets to a live concert. Only after the Second World War, however, did recorded music become a mass media product, when it was transmitted to and consumed by a large new and young market via radio and cheap vinyl.²¹ Moreover, rock music created a new type of star singer, like Elvis Presley, who embodied youth for a large youthful audience.²²

From the second half of the twentieth century onwards, the most common way of listening to popular song was via recordings or airwave transmission, and more recently also via digital channels. Disembodied, technologically transmitted voices have become the regular vocal sound in Euro-American popular music. The star system, an important part of that musical culture, is based on the technologically constituted presence of mostly absent idealised bodies. Youth is a part of the bodily performances of youth culture and belongs to the technological presence of star bodies. It is a component of audible star images that become mediums of memory over time: we can still listen to Elvis’s youthful voice. Even as a later generation we can perceive the audible markers of a now historic youth culture.

As the example from the 1920s has shown, the phonographic disembodiment of voices led to artistic challenges to supposedly fixed gender and sexual identities at an early stage of technological development. It has often been observed that the urban popular culture of the 1920s already included many progressive elements in aesthetic as well as political terms. Evidently that period also saw a potential for challenging

20 Mungen 2012, 169–180.

21 Cf. Frith 1981.

22 Cf. Shumway 2015.

heterosexual gender norms through recorded popular song, thus introducing a kind of musical queerness *avant la lettre*.

AMPLIFIED PRESENCE: MICROPHONIC BODIES

Technology does not only deliver vocal sounds into times and places where the singing body is absent; it may also enhance or amplify the presence of the body in the here and now. From a chronological perspective this has been a later step in the technological development: early sound recordings were produced by the mechanical transformation of the vocal sounds into “tracks” on wax cylinders or records. Musicians, vocalists as well as instrumentalists, had to adapt their performances to the very special conditions of the studio; “natural” singing was not possible because the position and movements of the body were strictly limited.²³ Only with the development of the electric microphone did a more natural singing become possible. The microphone allowed the recording of relatively low sounds, sounds that we usually only hear when our ear is close to the singer’s mouth. Thus, microphone technology not only improves the conditions for the presence of a voicing body, but even offers opportunities to enhance that presence. This effect can be used in popular song in various ways, all of which affect the identity behind the vocal sound. Here I will discuss three distinct representative strategies for amplifying the bodily presence, each related to certain musical styles and their respective cultural contexts.

The first strategy for amplified presence is the singing style called “crooning”, which developed in the 1920s with the emergence of electric microphones and radio broadcasting in the United States. As Knut Holtsträter emphasises in his study on crooners, for the first time in the history of singing a speaking voice could be used as solo voice together with orchestral accompaniment.²⁴ The impression of intimacy results from the combination of a certain style of singing into the microphone with a strategy that is both lyrical and performative: the singing is close to talking at a low level of loudness; singing very close to the microphone creates an electroacoustic effect of giving greater prominence to the lower frequencies; the crooners used to address their audiences more directly in both their singing and their lyrics. Interestingly for the perspective of identity, the image of the crooner is primarily associated with male singers like Bing Crosby (1903–1977), Frank Sinatra (1915–1998), and Sammy Davis Jr. (1925–1990); Sinatra in particular embodied the stereotypical male crooner of the 1950s and 1960s. Nevertheless, many other singers, including female singers such as Billie Holiday (1915–1957) and Sarah Vaughan (1924–1990), made use of the crooning style.²⁵ From the broad variety of examples I choose here Sinatra’s version

23 Cf. Gauß 2009, 164–191.

24 Holtsträter 2011, 151.

25 Cf. Hähnel 2015; Hähnel gives detailed analysis of the style of early crooners before Sinatra.

of “Someone to Watch Over Me”.²⁶ The highly intimate effect can be heard in a comparison with other recordings of the same ballad, such as that by female jazz singer Lee Wiley (1908–1975).²⁷ Even though Wiley’s voice also sounds intimately present on the recording and she too sings some quite aspirate tones, Sinatra makes significantly more use of the effect created by letting the microphone lift the lower frequencies of his voice (as in the characteristic low beginning of the song’s rising melody) and allows his voice to tend much more towards speaking and rather noise-like sounds.

A second strategy that involves using the microphone to amplify presence can be found in the diverse practices of beatboxing and vocal percussion. In this case, a person imitates percussion instruments and thus, one could say, imitates technology, but the most present effect of this method is a product of technological amplification. Trained vocalists are capable of naturalistically imitating sound from acoustic or electronic percussion or from drumming by producing percussive sounds with their mouths, sometimes in combination with hand slaps on body parts. In the early days of hip hop, beatboxing was practised without amplification. When combined with microphone technology, however, percussive sounds produced with the mouth can be amplified such that listeners can imagine having their ears intimately close to the mouth of the musician. For instance, it is interesting to listen to the contribution of well-known beatboxer Rahzel on Björk’s album *Medúlla* (2004), a contribution produced exclusively with human voices, combined, of course, with production technology. Rahzel often combines percussive sounds, produced with breath, lips, and tongue, with low, sliding bass lines, often sung with the mouth shut – mostly relatively soft sounds that can be perceived as present, clear, and voluminous. On the track “The Pleasure is All Mine”, Rahzel’s soft electronic-style beatbox is combined with, among others, breath sounds by Björk, generating audible representatives of intimacy made directly present by amplification.²⁸

Coming from a different style, the African American a cappella group Take VI uses voice and body percussion in addition to their multivocal arrangements. On their album *So Much 2 Say*, Take VI emphasise their use of vocal percussion with ostentation as well as with a self-ironic twist on the track “I L-O-V-E U” by introducing it with a minimal spoken track called “Human Body”: here, a ludicrous-sounding speaker announces that “all the sounds on this next song including the drums were made by the human voice or some other part of ... the human body”.²⁹

For a third strategy of microphonic presence, I refer to a vocal style that has become common in extreme metal genres like death metal or in hardcore or hybrid

26 Frank Sinatra, Axel Stordahl Orchestra, “Someone to Watch Over Me”, in *’S Wonderful: The Songs of George Gershwin, His 51 Finest (1925–1951)* (Retrospective, 2011).

27 Lee Wiley, Eddie Condon and his Band, “Someone to Watch Over Me”, in *Romantic Standards: The Great American Love Songs* (Varese Sarabande, n.d.).

28 See also the documentary in Björk, *Medúlla* special, The Archive DVD Series (2-Disc Set) (Wellhart/One Little Indian, 2004–2005).

29 Take 6, *So Much 2 Say* (Reprise Records, 1990).

forms like metal core, a style that is often called “growling”. This vocal practice involves producing a low, growl- or grunt-like sound without a distinct pitch by vibration of the so-called “false chords”, situated in the larynx above the vocal chords, which are used for “normal” singing.³⁰ Britta Görtz (b. 1977), vocalist of the German thrash metal band Crippler and experienced growler, demonstrated her style of growling during two courses I gave at Hanover University of Music, Drama and Media in 2011 and 2012. By involving students who lacked any experience in that style, she vividly showed that a basic form of growling could easily be experienced by coughing and then holding the low sound by a longer breath. Extensive training is necessary to make that sound a musical expression, not to mention avoiding damaging the larynx. In practice, growlers blend different more noise-oriented forms of vocal expression, or simply “screaming” according to the term used by Melissa Cross, who as a professionally trained singer has specialised in training metal and hardcore vocalists.³¹ Certain forms of screaming can be loud (as in the everyday notion of screaming), but sophisticated screamers also use a style that is acoustically relatively low but conceived as loud because of the microphonic amplification. Amplification is necessary not least in order to compete with the other instruments in a regular metal or hardcore band, namely electric guitars and drums. Although growling is common in certain rather subcultural genres, outsiders who are not familiar with these styles regularly do not associate them with human singing. It is possible to associate these vocal sounds with animalistic utterances, with for instance the “growl” of a bear or a dog – hence the term – or even with fictive non-human beings such as monsters, perhaps as a result of sound clichés established in the history of horror movies. Monstrous associations fit with the topics of many death metal lyrics.³² Because of its low pitch, growling is more readily associated with male voices than with female voices, and the stereotypical association has therefore persisted up to recently, reinforced by the absence of female growlers in the death metal scene. The voices of female growlers such as vocalist Görtz are often misread as male voices, at least by outside listeners. Görtz’s vocal style can be heard exemplarily on the track “New Shadow” from Crippler’s album *Antagonist* (2012).³³ The characteristic sound of growling and of similar vocal styles is regularly produced with the body proper, that is, without technology, but its loudness and consequently its association with angry expression or with animalistic or monstrous utterances are results of electronic amplification.

30 There is still extensive research to be done on that vocal style. My description is based on information given by vocalists like Angela Gossow (see note 22) and Britta Görtz in personal interviews and vocal workshops, furthermore on Cross (2005/2007). For a recent overview of different vocal styles that are used in heavy metal see Mesia/Ribaldini 2015; Mesia and Ribaldini, who use the term “grunt” rather than the term “growl”, point out that even though some authors have tried to differentiate between growl and grunt, “it is not possible to summarize one and only grunt technique at the moment” (389).

31 Cross 2005/2007.

32 See Heesch 2011 and Heesch 2012.

33 Crippler, *Antagonist* (Crippler, 2012).

All three described constructions of microphonic bodies have in common the electronic amplification of relatively soft vocal sounds. The presence of body sounds is enhanced by technology. By amplifying characteristic vocal sounds each style generates characteristic vocal identities. Crooning is mainly about intimacy, be it more erotic or more melancholic, with mostly male singers who are soft but masculine. Beatboxing and vocal percussion present the vocally produced sounds of drum kits or drum machines. In contrast to crooning, this type of amplified presence communicates an encounter not with another person but with a kind of human machine or instrument. Growling, too, implies alienation from the human in the human voice, but in this case the non-human part resembles not a machine but rather some kind of monster.

All three types of amplified presence are based on certain uses of the microphone, employed to amplify and record relatively soft bodily produced sounds. It makes us perceive vocal sounds in an intimate way, as if our ears are very close to the mouth of the vocalist. Hence the microphone is for sound what the microscope is for sight: both increase what is rather “small”, zooming in to bring it close to our sensual organs. Sometimes, vocalists handle the microphone in a certain way, holding it close to the mouth, touching it, or cupping it with one or two hands to produce certain effects, for example. Altogether, the microphone is more than a technology that makes an absent body present, for it may even enhance that presence.

At the same time, the types of microphonic bodies discussed here do not necessarily depend on other technological transformations via electronic effect, even though in practice it is quite common to make use of reverb, delay, or compression, for example. The combination of bodily produced sound with such technologies will be discussed in the following category.

WHO OR WHAT IS SINGING? HYBRIDITY

The debate over the difference between recorded sound and its source emerged along with the early gramophone. That difference became even more obvious with the development of modern studio technique. Peter Wicke saw the recording of Buddy Holly’s song “Words of Love” as a milestone in this development. Norman Petty recorded Holly in 1957 in Clovis, New Mexico, using multitrack recording to allow the singer to perform a second voice in addition to his own first voice. Wicke noted the significance for the media culture of the twentieth century of this new phenomenon, whereby one voice could be heard twice simultaneously on a record: “As a synthesis of human sound production and machine-made mutations this product epitomizes the bodiless sound of the media age.”³⁴ Recording popular music changed from documentation of something that could also be performed live to music production. Re-

34 “Das Produkt ist als Synthese aus menschlicher Lauterzeugung und maschinellen Mutationen der Inbegriff für den körperlos gewordenen Klang des Medienzeitalters”, Wicke 2011, 70, translation F. H.; see also Wicke 2001.

cord labels such as Motown Record Corporation, the first African American record company, founded by Berry Gordy (b. 1929) in Detroit in 1959, strived to establish an idiosyncratic sound.³⁵ The Motown Sound became a kind of auditive trademark and was associated with artists like The Marvelettes, Marvin Gaye, and the early Stevie Wonder.

The development of the studio means that what we hear in recordings of popular music is regularly not, or at least not only, a human voice but a sound that results from a combination of bodily and technological practices. This observation raises questions about authenticity: for instance, as concerns playback, whether the singer we are watching on the stage is able to sing this without the large apparatus in front of and behind her or him. In extreme cases we may listen to a singing voice while watching a non-singing body, as in the case of Milli Vanilli, a pop duo whose Grammy Award for their debut album was withdrawn in 1990 because they did not sing themselves.³⁶

Indeed, the identity of the singer in recorded popular song, crucial according to Moore for any hermeneutic approach, seems to be only partially a bodily defined identity. It makes sense to describe that vocal identity generally as, in Wicke's words, "a synthesis of human sound production and machine-made mutations". Wicke is right in calling that sound "bodiless", in as much as it is recorded and hence characterised by the absence of the body I described in the first category. However, even a highly processed studio recording of a human voice still includes bodily produced elements of sound. The technologically transmitted sound makes the absent body present, even if we would see (or hear) that presence as an audible illusion. Thus, the sound of recorded popular song is not absolutely bodiless, but a hybrid of human body sounds and technological processing. The vocal identity, then, is less the pure result of human performance than a hybrid of human and technology.

Donna Haraway theorised such hybrids early as cyborgs.³⁷ A cyborg, according to Haraway, "is a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction".³⁸ Haraway considers the cyborg a challenge to common dualistic views of human beings, hence its potential to overcome stereotypes of race, gender, and totalitarian politics in general. Therefore, Haraway's concept can be regarded as one possible strategy of what later has been called queerness, although it has been criticised for its rather utopian view and lack of censure of the dangerous aspects and militaristic and totalitarian concepts of cyborgs.³⁹ Still, it is revealing to study the subversive potential of cyborg-like hybrids, as long as one keeps in mind that hybridity does not include subversion per se.

35 In 1959, the company was founded as Tamla Records; the renaming as Motown followed in 1961, cf. Bowman 2015.

36 See the complex discussion on that example of questioned authenticity in Auslander 2008.

37 Haraway 2010.

38 Haraway 2010, 2190.

39 Cf. Leibetseder 2010, 229–250.

As we have seen, recorded popular song can be heard as representing hybrid singer identities in general, but certain technologies of sound processing enforce the hybridity more blatantly than others. Machines like the vocoder or the talk box basically function by combining vocal and instrumental sounds. These technologies make the mixture of voice and machine so obviously audible that it would hardly be possible to miss the hybridising effect. I will therefore discuss the category of hybridity by focusing on these special technologies. Although they were originally developed as hardware machines, certain software was generated around 2000 that can produce similar sound effects. In terms of technology, I will therefore also take some software into consideration.

The vocoder, its name a contraction of “voice coder”, was invented by Homer W. Dudley (1896–1987) and developed in the Bell Labs, the research section of the U.S. telephone company AT&T, during the 1930s.⁴⁰ Its original purpose was to reduce the bandwidth of telephone signals by filtering the relatively slow frequencies of verbal articulation out of the transmitted vocal signal and synthesising a new vocal signal from the reduced frequency band and an unvoiced signal at the receiving end. In the Second World War and during the Cold War, vocoder technology was used for transmitting coded voice messages overseas. Since its first public demonstrations in 1936, the vocoder has been used with reference to music, by transforming singing voices. Pioneer of electronic music Wendy Carlos (b. 1939) introduced vocoderised singing to a larger public in her soundtrack for Stanley Kubrick’s movie *A Clockwork Orange* (1972). Like Carlos, the German band Kraftwerk, known as pioneering for its considered use of electronics in popular music, employed the vocoder, a machine with no original musical-related purpose, years before vocoders were commercially produced by music technology companies. The members of Kraftwerk dealt with early research on vocoder technology in the electronic music studios in Cologne, in particular the activities of radio engineer and information theorist Werner Meyer-Eppler (1913–1960), who had played Dudley’s early vocoder demonstrations for a German public. According to Tompkins, Dudley “had a power line humming as ‘the voice of electricity,’ lighting houses and claiming to be power itself”,⁴¹ an idea Kraftwerk included in a track on their album *Radio-Aktivität* (Radio-Activity, 1975). “Die Stimme der Energie” (“The Voice of Energy”) largely consists of the following text, spoken by a voice that is modulated into a monotonous “robot voice” by a vocoder:⁴²

Hier spricht die Stimme der Energie.
Ich bin ein riesiger elektrischer Generator.

40 Cf. Tompkins 2011. To Tompkins the art of storytelling seems to be as important as delivering information, and more important than giving precise indications of his sources as measured by academic norms. Nevertheless, his book contains reliable information, heavily relevant to the history of the vocoder.

41 Tompkins 2011, 48.

42 Kraftwerk, “Die Stimme der Energie”, in *Radio-Aktivität* (Klingklang 1975, CD-reissue EMI).

Ich liefere Ihnen Licht und Kraft
und ermögliche es Ihnen,
Sprache, Musik und Bild durch den Äther auszusenden und zu empfangen.
Ich bin Ihr Diener und Ihr Herr zugleich.
Deshalb hütet mich gut,
mich, den Genius der Energie.

This is the voice of energy.
I am a giant electric generator.
I provide you with light and power
and the possibility
to send and receive words, music and pictures via airwaves.
I am your servant and your master at the same time.
This is why you should care for me,
me, the genius of energy.

The vocoder principle in Carlos's and Kraftwerk's music was basically reproduced in the vocoder machines that could subsequently be purchased to make musical effects: a vocal signal is filtered and combined with another sound source – usually not a power line but a musical instrument like keyboard or guitar. Thus, the voice becomes the modulator, the instrument becomes the carrier of the sound. In addition to the rather technical process of production, the vocoder affects our perception of the singing voice enormously. The “bodiless sound” that Wicke ascribes to studio-produced music since the introduction of multitrack recording in general is also a principal characteristic of vocoderised singing, although it can be even more explicitly bodiless, for we may hear singing instruments or voices that seem to sound from strange non-human or at least only partially human beings. Thus, recorded music with vocoderised voices points our minds to the relationship between the subject's body and the machine, or, as Kay Dickinson states in her study on vocoders and female identity: “vocoder tracks vividly highlight the inextricable bond between subjectivity and mechanisation. They propose a dichotomy between the vocoded voice and the more ‘organic’ one.”⁴³

When it comes to identity, the crucial question is, who uses technologies like the vocoder to modify his or her voice into a hybrid sound of body and machine? When we look critically at how voices in popular music are constructed in line with racist stereotypes, it is easy to observe that African American voices heard in genres like blues, gospel, rhythm and blues, and soul are often conceived as sounding particularly natural or human.⁴⁴ However, a closer look at African American culture reveals that the stereotypical association with “humanity” is unfounded. As Kodwo Eshun has shown

43 Dickinson 2001, 336.

44 As Allan Moore has shown, early rock musicians, particularly in the United Kingdom, held an image of the African American blues as closely connected to a romanticised picture of “natural” African culture; see Moore 2001, 71–75.

in his seminal study on the development of African American music from jazz to hip hop and house, African American musical culture characteristically has made particular use of technology.⁴⁵ With regard to technologically transformed voices, Alexander Weheliye emphasises that in African American culture the notion of humanity rather draws a blank because of the long experience of slavery, discrimination, and marginalisation, which implies a lack of being regarded humanely.⁴⁶ In fact, not only hip hop and house artists, who may represent particularly technological ways of music production, but also rhythm and blues artists make extensive use of technological voices and were already doing so in the context of the Motown Sound phenomenon. Widening Eshun's gaze, Weheliye pays particular attention to human-machine voices in rhythm and blues, including an exemplary analysis of the ballad "Computer Love" by the band Zapp, a track that according to Weheliye contributed to "the reemergence of the vocoder in R&B" after the early 1980s, when the popularity of the vocoder had first peaked.⁴⁷ "Computer Love" (1985) alludes to Kraftwerk's earlier track with the same name (in German: "Computerliebe") in *Computerwelt* (Computer World, 1981). However, in contrast to Kraftwerk, Zapp not only emphasises the machine-like sound of the voice but also underlines the "human" aspect by combining a "vocoderised voice" (that of Roger Troutman) with two "ordinarily" produced voices, one male (Charlie Wilson) and one female (Shelley Murdock).⁴⁸

In one technical aspect Weheliye might be wrong, for according to Tompkins, Zapp's frontman Roger Troutman (1951–1999) used not a vocoder but a talk box. This device directs an acoustic signal, usually that of an instrument, via a tube into the mouth of a musician, who can make the instrumental sound "sing" by articulating without even using his or her own larynx. Thus, the blending of instrumental and bodily sounds happens within the body or, more precisely, in the mouth; from here the mixed sound can be amplified via microphone. Troutman's virtuosic use of the talk box has often been attributed to the vocoder: according to Tompkins, "Roger Troutman is the most famous vocoderer to never use a vocoder. Talk Boxes and vocoders are confused more than bad for good."⁴⁹ Yet, whatever machine Troutman used, it still seems to have incited a new popularity for the vocoder. Whatever the case, Weheliye's observations on the extensive use of technologically transformed voices in African American music remain true. The hegemonic stereotype of the natural "human" black voice is clearly challenged by tracks like "Computer Love".

That stereotype is obviously hegemonic, because it is based on a dichotomy: on one side there is the association of the allegedly natural/bodily voice with black and/or female singers; on the other side we find technology and hence machine-made voices

45 Eshun 1998.

46 Weheliye 2002.

47 Weheliye 2002, 35.

48 Weheliye 2002, 35–36.

49 Tompkins 2011, 138.

as the alleged realm of white Euro-American men. As Weheliye shows, argumentation is necessary to reveal the hegemonic nature and the implied oversimplification of that dichotomy. Listening to the music can help deconstruct such stereotypes because it leads to audible encounters with unexpected identities, for instance African American and female singers.

Indeed, the vocoder (and also the talk box) shares a gender bias with many other technologies in Euro-American culture. At least in the first period of its musical history, the vocoder was used more often by men than by women, although not exclusively, as the early example of Wendy Carlos indicates. Laurie Anderson's track "O Superman", which originated in avant-garde performance but reached number two in the UK single charts in 1981, stages a gender-critical reflection of android identity via the vocoder. In Susan McClary's seminal study on gender in music, Anderson serves as a crucial example for how delineations of gender are challenged: as McClary points out, "When Anderson involves herself with electronics, she confuses ... habits of thought grounded in gender difference."⁵⁰ As critical as Anderson's example was, it has long been a rather singular deviation from the stereotypically masculine association with the vocoder technology. That stereotype was fractured more extensively in the late 1990s. Kay Dickinson dates this shift to 1998, the year after Cher had her late number one hit with "Believe": since then, the vocoder effect has been adapted by a range of other female artists and has been heard many times in chart hits.⁵¹

Again, as in the case of Troutman's contribution to the vocoder's popularity in black music, the technical contribution will likely be debated. Cher recorded her vocals for "Believe" without a vocoder, although she had reportedly brought up the idea of applying a telephone-like sound to her voice. The instrument-like steps in certain passages of her singing are a product of an effect applied to the record track subsequently by sound engineer Mark Taylor. During an interview in 1999 for *Sound on Sound*, a journal for recording technology, Taylor stated that he had intended to apply a vocoder effect, but when the then classical vocoder Korg VC 10 did not produce the desired effect, a Digitech Talker vocoder pedal was used.⁵² Consequently, Taylor talks about the passages that include the stepping effect as the "vocoded sections". The technical protest against that account would suggest that this effect was generated not with a vocoder but with Auto-tune, a software programme for pitch correction in song recording that was published in 1997. According to the online re-edition of the *Sound on Sound* article, it seems established as fact that "the (now) highly recognisable tonal mangling" in "Believe" was produced with Auto-tune.⁵³ It would be

50 McClary 2002, 138. McClary's detailed analysis of "O Superman" focuses on the lyrics and harmonic structure rather than on the use of the vocoder. For a recent discussion of the reception of the piece in scholarship and further analytical insights, see Eckenroth 2014, 21–24.

51 Dickinson 2001.

52 Sillitoe/ Bell 1999. Dickinson 2001 quotes indirectly from that article, too, but without reference.

53 Sillitoe/ Bell 1999, "historical footnote" by the editors.

interesting to investigate further discursive strategies to establish which electronic devices were actually used in recording, for instance with regard to the instructions for generating the “infamous ‘Cher effect’” with Auto-tune in the software manual by manufacturer Antares.⁵⁴

This effect was popularised by Cher’s “Believe”. One may wonder whether Dickinson, who, following Taylor’s report, calls it a vocoder effect, remains right in arguing that Cher helped challenge the masculine connotations of the vocoder technology. I think her main argument is still relevant inasmuch as many later singers, females as well as males, successfully used similar effects in popular songs. What is important here is that several technologies, including the vocoder, the talk box, and Auto-tune, can be deemed to generate blatantly hybridised (wo-)man-machine-voices. Although they function differently, their effects of hybridity sound relatively similar, and therefore they can easily be confused.

I conclude this section with a recent example of female use of the vocoder, namely with Lady Gaga’s track “Aura” on her album *Artpop*.⁵⁵ It is certainly interesting to consider Lady Gaga’s work with regard to discussions of feminism in current popular culture; her music is more than interesting enough to justify a closer look. “Aura” is of particular interest in the context of this article not only because it includes parts with a hybrid voice, but also because it includes direct interplay between an instrument and the hybridised voice as well as lyrics that reflect questions of identity. In the introduction of the track we hear a pattern of strummed chords on an acoustic guitar and Gaga’s technologically alienated voice. At some point the guitar plays an ornamental melodic line, first falling then ascending, that is repeated several times in multiple layers by Gaga’s voice, which, at the end, rhythmically repeats the same tone, whereby that rhythm and articulation are obviously machine-made in the way that they imitate the sound of the (even electronically modified) guitar line. The eponymous repeated “aura”, too, is clearly intelligible but at the same time electronically distorted. The lyrics portray from a first-person perspective a self-confident woman who addresses some “lover”. Interestingly, Gaga’s voice sounds most clear and “natural” (which, in contrast to the verses, also is a product of her singing style) when she asks her lover, “Do you wanna see me naked? ... Do you wanna see the girl behind the curtain, behind the aura?” Her “aura”, her (self-)image, is in a not-too-blunt way connected to the more electronic sounds of the accompaniment and to hybrid vocal parts similar to the “Believe” or Auto-tune style. Even at the end, the word “aura” is heard in a technological sound again, and finally, with the typical science-fiction movie effect of a “robot voice”, the word “artpop” is heard, quoting the title of the album. Although

54 Antares Audio Technologies, Auto-Tune 5: Pitch Correcting Plug-in, Owner’s Manual (2006), 17, online on Antares’s website, accessed 28 January 2016. Since version 7 the unmistakably pejorative attribute “infamous” has been deleted from the manual in favour of a rather canonising narrative of Cher’s pioneering role in the history of the software.

55 Lady Gaga, *Artpop* (Streamline Records, 2013).

other passages may be generated with Auto-tune or similar effects, the final robotic sound clearly resembles a typical vocoder effect.

Certainly, “Aura” is a typical pop track even in carrying different readings. Nevertheless, I think, this short look at Lady Gaga’s use of hybrid vocals can be read in consort with Jack Halberstam’s model of “Gaga feminism” as a strategy of using up-to-date popular styles and technology and at the same time playing, in ways that may seem crazy, with aesthetic modes of identity.⁵⁶ While Halberstam focuses on Lady Gaga’s visual strategies and obviously considers her musical output less relevant, we have seen that the latter offers interesting insights on challenging notions of identity, certainly even more than can be explored within the scope of this article.

As this exemplary overview of strategies for using the body and technology for the creation of popular musical voices has shown, all these aesthetic practices raise questions about fictional and real identities. Popular musicians tend to make use of the most up-to-date technology even for transforming voices or creating new voices. This does not necessary result in new or never-heard-before sounds – pop is mostly not interested in the strategies of musical avant-garde. However, the links between the use of technology and aspects of identity are also novel territory. In this regard, many of these popular hybrids of bodily and technological voices connect to very current discussions about who we are and why and how we use both our bodies and our technology.

CONCLUSION

This article started from the observation that since the advent of phonography in Euro-American culture, singing voices have mostly been listened to in technologically transformed and transmitted ways. Recorded popular song is certainly highly relevant for the perception of music, for how people experienced and still experience the singing voice in the twentieth and twenty-first centuries. The presentness of sound, according to Ong, highlights the importance of the encounter with the singing subject for hermeneutic approaches to recorded popular song. Listening to song raises the question of the identity behind the voice. In my example-based overview of the technological and musical history of popular-song recording, I have developed three systematic categories for describing the variety of the relationships between voice, body, and technology with regard to musical representations of identity.

First, as a basic effect of phonography we hear the voices of absent bodies. While we experience that recorded sound as a presence, the identity of the vocal subject is directly bound not to a body in the here-and-now but to bodily produced sounds in the there-and-then, which implies an uncertainty about the present identity of the singer. He or she may have gone through more or less dramatic changes in the mean-

56 Halberstam 2012.

time, from aging to dying, although we still perceive the presence of, for example, a young pop star. Moreover, we may even be unsure about the singer's gender and/or sexuality, as the experiments in the context of schlager recordings from as early as the 1920s illustrate. Some cases, like Max Kuttner's gramophone schlager, reveal how popular culture even reflects its medial and technological conditions.

Secondly, more than just a recording tool, the microphone can even be used as an amplifier of the vocal presence. Comparable to the microscope in the visual world, the microphone enhances something that can otherwise hardly be perceived. It moves even soft sounds closer to our ears, closer than we ever could get to the mouth of the singer or the vocal percussionist or beatboxer. Thereby, the music can include quite different affections, from emotions of romance (crooning) to anger and aggression (growling). The singer's identity is represented in that enhanced way through the microscopic microphone. At least in the moment of listening, there is no way to encounter the singing body more distantly.

Thirdly, at its core every recorded voice is a hybrid of bodily and technologically produced sounds. Maybe the general presentness of sound makes us tend to ignore the technological part of the recorded voices in favour of a more or less illusionary encounter with another body. However, machines like the vocoder or the talk box or software effects like the "Cher-effect" in Auto-tune blatantly expose the hybridity of recorded voices. Although cyborg sounds may sometimes even reveal "robotic" qualities, they generally offer a wide range of musically represented hybrid identities. This kind of hybridity does not necessarily challenge stereotypical dichotomies in the fields of race and gender, but it has the potential to do so, as the use of cyborg voices by African American musicians and female singers shows. The example of Lady Gaga reveals that her queer-feminist concept is manifest not only in her visual aesthetic, which has been qualified as "Gaga feminism" by Halberstam, but also in her hybrid vocal sounds.

It should be obvious that these three categories are not absolutely distinct from each other; they may intermingle in many different ways. Within the scope of this article I have attempted to show that it is most interesting to study the relationships of body and technology in close readings of musical examples. Certainly, other examples from the multifaceted world of recorded popular song would produce different observations, and it will be interesting to study how the use of microphonic identities and hybrid voices changes in light of recent developments in Internet technology and mobile devices. That, however, will be another story.

BIBLIOGRAPHY

- Auslander, Philipp, 2008, *Liveness: Performance in a Mediatized Culture*, London: Routledge.
- Auslander, Philipp, 2009, *Musical Persona: The Physical Performance of Popular Music*, in: Scott, Derek B. (ed.), *The Ashgate Research Companion to Popular Musicology*, Farnham: Ashgate, 303–316.
- Barthes, Roland, 1977, *Image – Music – Text*, London: Fontana Press.
- Bowman, Rob, 2015, *Motown*, Grove Music Online. Oxford Music Online, Oxford University Press: <http://www.oxfordmusiconline.com/subscriber/article/grove/music/19225> [accessed 26 September 2015].
- Cross, Melissa, 2005/2007, *The Zen of Screaming: Vocal Instruction for a New Breed*, 2 vols. Loudmouth.
- Cusick, Suzanne G., 1999, *On Musical Performances of Gender and Sex*, in: Barkin, Elaine/Hamessley, Lydia (eds.), *Audible Traces: Gender, Identity, and Music*, Zurich: Carciofoli, 25–48.
- Dickinson, Kay, 2001, “Believe”? Vocoders, Digitalised Female Identity and Camp, *Popular Music* 20, 3, 333–347.
- Dibben, Nicola, 2002, *Gender Identity and Music*, in: MacDonald, Raymond A. R./Hargreaves, David J./Miel, Dorothy (eds.), *Musical Identities*, Oxford: Oxford University Press, 117–133.
- Eckenroth, Lindsey, 2014, *Once Again, on the Music of Laurie Anderson’s “O Superman (for Massenet)”*, *American Music Review* 43, 2, 21–24.
- Ernst, Christoph/Paul, Heike (eds.), 2013, *Präsenz und implizites Wissen: Zur Interdependenz zweier Schlüsselbegriffe der Kultur- und Sozialwissenschaften*, Bielefeld: transcript.
- Eshun, Kodwo, 1998, *More Brilliant than the Sun: Adventures in Sonic Fiction*, London: Quartet Books.
- Frith, Simon, 1981, *Sound Effects: Youth, Leisure, and the Politics of Rock’n’Roll*, New York: Pantheon Books.
- Frith, Simon, 1998, *Performing Rites: On the Value of Popular Music*, Cambridge, MA: Harvard University Press.
- Gauß, Stefan, 2009, *Nadel, Rille, Trichter: Kulturgeschichte des Phonographen und des Grammophons in Deutschland (1900–1940)*, Cologne: Böhlau.
- Gauß, Stefan, 2013, *Der Sound aus dem Trichter: Kulturgeschichte des Phonographen und des Grammophons*, in: Paul, Gerhard/Schock, Ralph (eds.), *Sound des Jahrhunderts*, Bonn: Bundeszentrale für politische Bildung, 30–35.
- Hähnel, Tilo, 2015, “The Cutest Flapper that You’ve Ever Seen”. Über die Anfänge des Crooning, in: Pfeleiderer, Martin (ed.), *Stimme, Kultur, Identität: Vokaler Ausdruck in der populären Musik der USA, 1900–1960*, Bielefeld: transcript, 129–150.
- Halberstam, J. Jack, 2012, *Gaga Feminism: Sex, Gender, and the End of Normal*, Boston: Beacon Press.
- Haraway, Donna, 2010, *A Manifesto for Cyborgs [1985]*, in: Leitch, Vincent B. (ed.), *The Norton Anthology of Theory and Criticism*, New York: Norton, 2190–2220.
- Heesch, Florian, 2011, *Extreme Metal und Gender: Zur Stimme der Death-Metal-Vokalistin Angela Gossow*, in: Meine, Sabine/Noeske, Nina (eds.), *Musik und Popularität: Aspekte zu einer Kulturgeschichte zwischen 1500 und heute*, Münster: Waxmann, 167–186.
- Heesch, Florian, 2012, *Metal for Nordic Men? Amon Amarth’s Representations of Vikings*, in: Scott, Niall W. R. (ed.), *Reflections in the Metal Void*, Oxford: Inter-Disciplinary Press, 167–182.
- Holtsträter, Knut, 2011, *Der Crooner, das unbekanntes Wesen*, in: Meine, Sabine/Noeske, Nina (eds.), *Musik und Popularität: Aspekte zu einer Kulturgeschichte zwischen 1500 und heute*, Münster: Waxmann, 145–165.
- Laing, Dave, 1991, *A Voice without a Face. Popular Music and the Phonograph in the 1890s*, *Popular Music* 10, 1, 1–9.
- Leibetseder, Doris, 2010, *Queere Tracks: Subversive Strategien in der Rock- und Popmusik*, Bielefeld: transcript, 229–250.

- McClary, Susan, 2002, *Feminine Endings: Music, Gender, and Sexuality*, with a New Introduction, Minneapolis: University of Minnesota Press.
- Mesiä, Susanna/Ribaldini, Paolo, 2015, Heavy Metal Vocals. A Terminology Compendium, in: Karjalainen, Toni-Matti/Kärki, Kimi, *Modern Heavy Metal: Markets, Practices and Culture*, Helsinki: Aalto University, 383–392.
- Middleton, Richard, 1990, *Studying Popular Music*, Milton Keynes: Open University Press.
- Moore, Allan F., 2001, *Rock: The Primary Text: Developing a Musicology of Rock*, Aldershot: Ashgate.
- Moore, Allan F., 2012, *Song Means: Analysing and Interpreting Recorded Popular Song*, Farnham: Ashgate.
- Mungen, Anno, 2012, Grammophon und Identität. Hohe männliche Stimmen auf Schallplattenaufnahmen der 1920er Jahre, in: Herr, Corinna/Jacobshagen, Arnold/Wessel, Kai (eds.), *Der Counterertenor: Die männliche Falsettstimme vom Mittelalter zur Gegenwart*, Mainz: Schott Music, 169–180.
- Ong, Walter, 1981, *The Presence of the Word: Some Prolegomena for Cultural and Religious History*, Minneapolis, MN: University of Minnesota Press, 101.
- Osborne, Richard, 2014, *Vinyl: A History of the Analogue Record*, Farnham: Ashgate.
- Shumway, David R., 2015, Rock Stars as Icons, in: Bennett, Andy/ Waksman, Steve (eds.), *The Sage Handbook of Popular Music*, London: Sage, 301–316.
- Sillitoe, Sue/Bell, Matt, 1999, Recording Cher's "Believe", *Sound on Sound*, February 1999, online edition, <http://www.soundonsound.com/sos/feb99/articles/tracks661.htm> [accessed 10 March 2016].
- Sterne, Jonathan, 2003, *The Audible Past: Cultural Origins of Sound Reproduction*, Durham, London: Duke University Press, 16–19.
- Tompkins, Dave, 2011, *How to Wreck a Nice Beach: The Vocoder from World War II to Hip-Hop: The Machine Speaks*, Brooklyn, NY: Melville House.
- von Hoff, Dagmar, 2005, Performanz/Repräsentation, in: von Braun, Christina/Stephan, Inge (eds.), *Gender@Wissen. Ein Handbuch der Gender-Theorien*, Cologne: Böhlau, 162–179.
- Weheliye, Alexander G., 2002, "Feenin". *Posthuman Voices in Contemporary Black Popular Music*, *Social Text* 71, 20, 2, 21–47.
- Wicke, Peter, 2001, Sound-Technologien und Körper-Metamorphosen. Das Populäre in der Musik des 20. Jahrhunderts, in: Wicke, Peter (ed.), *Rock- und Popmusik*, Laaber: Laaber, 11–60.
- Wicke, Peter, 2011, *Rock und Pop: von Elvis Presley bis Lady Gaga*, Munich: Beck.
- Young, Miriama, 2015, *Singing the Body Electric: The Human Voice and Sound Technology*, Farnham: Ashgate.

