

# Collecting Silences: A Comparative Analysis of Silence in Swedish Radio from P1 and P3, 1980-1989

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## Abstract

This article proposes a methodological approach to the analysis of large-scale radio archives. By collecting and measuring silences in broadcasting, the analysis explores stylistic differences within the Swedish media monopoly in the 1980s. This period marks the last decade of the Swedish public service monopoly and offers rigorous data on the development of mass media without deregulated economic competition. In 1993 Sweden became one of the last European countries to allow commercial radio, nevertheless, during the decade prior, competition was introduced from within the monopoly. At the time, Swedish radio featured several separate channels. This analysis focuses on the longstanding flagship channel P1, and its main competition, P3, which was considered a more youth-oriented alternative. Prior research has stressed the independent and different character of these two channels, subscribing to a depiction of a harmonically diversified media system. By analyzing the very audio data preserved from the broadcasting, it is possible to explore such stylistic divergences, as well as similarities, on a quantitative level. What unique features can be detected by studying the very signal, and are there homogenous tendencies beyond these differences?

In order to approach this question, I propose a simple method: collecting silences. By means of basic signal processing, the amount of silence in broadcasting can be extracted and comparatively studied. Once data on the pauses and gaps in the broadcasting has been extracted, both the total amount and the number of occurrences can be analyzed. Moreover, the method can be applied both to the overall structure and on separate sections within the broadcasting, to achieve a more granular understanding. In doing this, it is possible to achieve new knowledge on the style and pace of broadcasting, and how these matters changed throughout the decade. The aim is both to render new insights into Swedish media history and to suggest new ways for digital humanities to integrate the vast potential of audio analysis.

## Keywords

Swedish Radio, Media History, Audio analysis, Silence, Public Service Broadcasting

## 1. Collecting Silences

"I collect a certain kind of leftovers."

"What kind of leftovers?" asked Humkoke.

"Silences," said Murke. "I collect silences."

Humkoke raised his eyebrows, and Murke went on, "When I have to cut tapes, in the places where the speakers sometimes pause for a moment—or sigh, or take a breath, or there is absolute silence—I don't throw that in the garbage can, I collect it." [1]

The fictional radio engineer Doctor Murke and his obsessive collection of silences invite us to think about the historical development of radio. Heinrich Böll's short story from 1955 has been interpreted

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as a comment on the gradual subordination of art under design within an increasingly “neurotic” broadcasting culture [2]. The satirical piece confronts the role of the radio medium in the postwar context. On the one hand, silence was strictly avoided on a formal level in order to render an effective and flowing listening experience. On the other hand, on a content level, mass media remained silent on the political issues of the time. For the radio historian, Murke’s fictional chore itself is a testament to the significant role of silence in broadcasting. His obsession is the only thing standing between silence and the ‘waste bin’. This reflects a more general tendency in the history of radio: silence has been a controversial topic since the emergence of the medium [3]. With radio’s sole reliance on the sonic register, silence has been hailed as a fundamental communicative and dramaturgical feature. Others have seen it as a threat to the medium itself. Prior research has gone so far as to consider silence and sound to be the most essential ‘code’ of broadcasting [4].

I argue that Böll’s fictional scenario can show the way for digital humanities toward new methodologies for audio data. By collecting silences, radio can be understood in new ways. This article measures the amount of silence in Swedish public service broadcasting throughout the 1980s. In doing this, it is possible to detect stylistic differences both in the overall programming and in the pace of the spoken content. Prior research has described the 80s as a time where Swedish production became attentive to the form of broadcasting [5]. This resulted in an increased focus beyond the spoken content of radio, raising awareness of how the medium sounded. Previous historical accounts have interpreted this as a process of differentiation within the media monopoly, resulting in channels and programs achieving clearer individual styles [6]. By analyzing the content of broadcasting through digital signal processing, it is possible to achieve new knowledge of both differences and similarities in the style of broadcasting. Thus, this article explores what we can learn about the history of radio by a quantitative analysis of the absence of content.

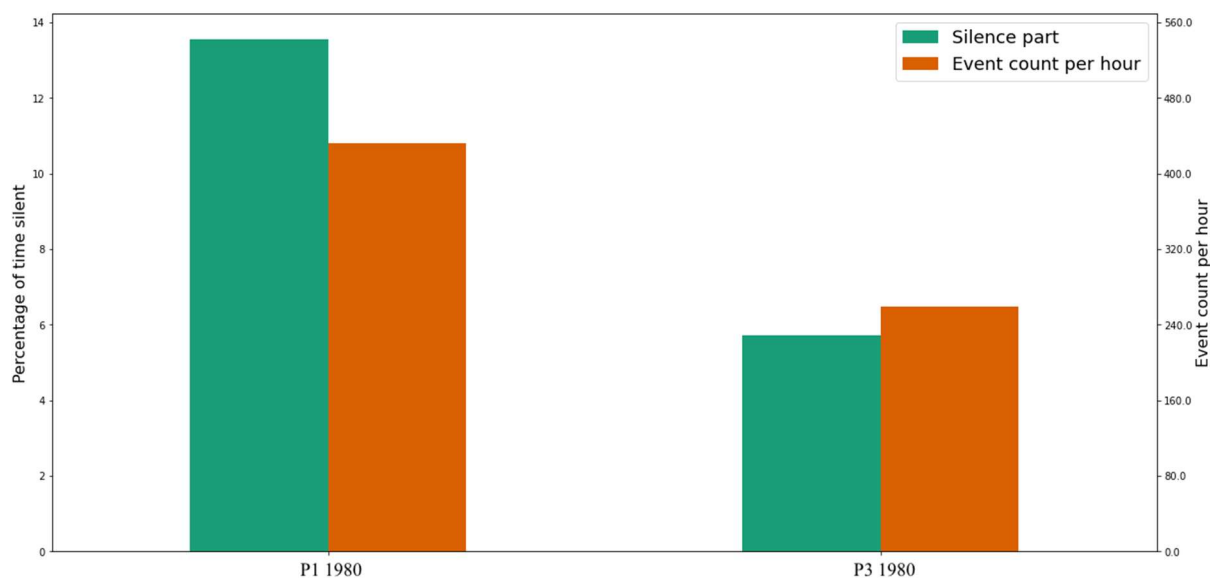
## 2. Silence and the Swedish case

The conflict between positive conceptions of radio silence and those who aim to minimize it has been aligned along the binary of commercial radio and public service broadcasting. Prior research has connected the necessity to maintain high listener numbers as a crucial factor in the negative conception of silence often associated with commercial radio. In contrast, public service broadcasting, being less economically reliant on audience statistics, is assumed to exhibit a more creative and curious approach to silence [7]. However, in practice, throughout the second half of the 20<sup>th</sup> century often the case is often a hybrid or mixed approach to media production, and the approach to silence is affected by factors transcending the binary between commercial and state-organized broadcasting. Sweden offers a good case to study the specifics closer. Swedish radio was since its inception in 1925 run by one non-governmental organization but through public funding. No commercial content was allowed, and the state policy still had a significant impact on decision-making. It was in effect filling the criteria for public service broadcasting. From the start, the monopoly provided one channel, P1, but throughout the second half of the 20<sup>th</sup> century, further channels were introduced. P1 remained the flagship, with a focus on news and educational content. However, by the 1980s, the role of Public Service media was under critique on an international level, and the sentiments resonated in Sweden as well [8]. The criticism was partly concerned with the homogenous content produced by national broadcasting companies, and the standard solution to the situation was a deregulation of the ether. By enabling competition between commercial alternatives, the media sphere was considered to develop a desirable diversity in regards to style and content. In Sweden, however, the solution was to maintain the monopoly but introduce competition from within. Throughout the 1980s, 25 regional stations were set up and hosted on the public service channels. Their content was integrated on the youth channel P3, which already was established as a source of alternative content into channel P1. Prior research has regarded this as coinciding with a turn towards the aesthetics of radio, resulting in a differentiated and individualized media landscape [9]. Nevertheless, in what way, and if at all competition benefits diversity in media production is a controversial question, and by studying the content from the aspect of silence as an indication of style and pace, it is possible to further nuance this historical depiction [10].

## 2.1. Data and method

The Swedish case is also noteworthy in regards to data. Due to the exceptionally early rule for mass media legal deposit of 1979, radio content is preserved to a uniquely extensive degree. In fact, when measured in 2004, the Swedish audiovisual archive was the largest in all of Europe, containing almost 5 million hours [11]. This allows for a quantitative approach, where the broadcasting days can be studied in their entirety. In the following work, I've applied a simple computational approach in order to mark silent areas in data collected from a set of sample days from the Swedish radio. Silence is here considered as any segment, longer than 300 milliseconds, where the noise floor constitutes the loudest signal. The choice of this specific threshold is inspired by prior work in conversation analysis and linguistics and pertains to qualities of human perception [12]. In contrast, however, to the popular threshold of milliseconds, this analysis uses a slightly short span in order to get to a more granular level of silences. The process is based on the basic audio processing tool, aubio, which runs directly in the programming language C [13]. The method is subsequently applied to sample sets from Swedish public service radio from four years throughout the 1980s. For each year, I have randomly sampled 20 days, each constituting roughly 18 hours of broadcasting material. The same dates have been analyzed in two different channels, P1 and P3, amounting to a total of around 2800 hours. It is arguably a lesser sample in regards to the total material, yet access to this data is legally restricted and only allows for small-scale samples at this time. The total data of almost 3000 hours would however still be a daunting amount to manually code. However, by reducing the complex content of radio broadcasting to the two simple parameters of sound and silence, a quantitative and comparative analysis becomes possible. My aim with this article is thus two-fold – both to postulate new data on the sonic development during the last decade of Swedish radio monopoly, and simultaneously make a case for the potential of computational audio processing in humanities research.

## 3. Analysis



**Figure 1:** Comparative measure of silence in the sample data from 1980, P1 displayed on the left side of the plot and P3 displayed on the right. The green bar designates the percentual amount of silence during the entire broadcasting day. The orange bar displays the number of occurrences of silence, with values designated on the right side of the graph.

Figure 1 presents how silent Swedish radio was at the onset of the decade. It displays both the percentage of silence and the number of occurrences in the sample set from 1980. To the left is the data from P1 and to the right is the collected data from channel P3. Altogether, it is clear that the two channels have different distributions of silence. By comparing the frequency of occurrence against the

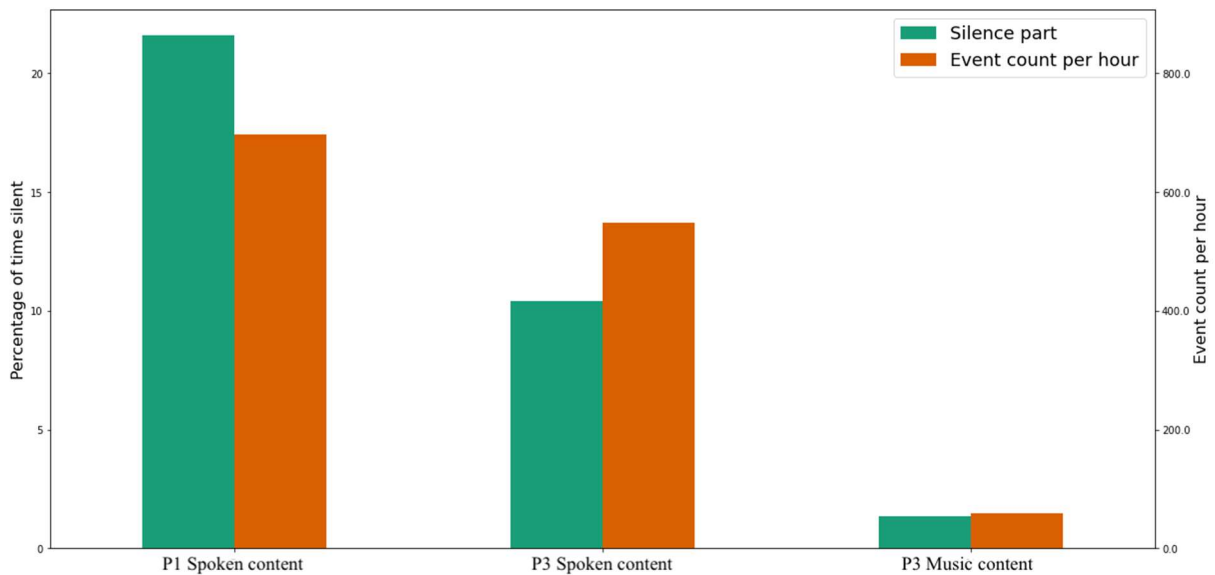
percentual total, however, it is clear that the number of pauses differs less. This is an indication that the P3 data doesn't only contain fewer pauses – the average single stop is also significantly shorter. This in turn tells something about the stylistic differences between the two channels. P1, the so-called “spoken channel”, owed its moniker to the speech-oriented content [14]. The channel hosted news shows, informational sections but also verbal entertainment and music. Nevertheless, prior research has demonstrated how music specifically migrated by the introduction of alternative channels. P3 was the first truly successful competitive alternative to P1, it received a rapid following and received large audiences due to its appeal to the youth [15]. That the two channels had different styles is a generally accepted claim. Yet, in what manner these styles differentiate entails further exploration. So, what are the causes for the different distributions of silence between the two channels?

06:00 Nyheter. Väder.	06:00 Lokalradio/Melodiradio.
06:05 Musik.	07:45 Förmiddag ▾
06:20 Morronpasset. Örebro.	08:30 Morronpasset. Örebro.
06:25 Musik.	08:40-10:00 Förmiddag ▾
06:30 Morgoneko med Väder.	09:00 Nyheter. Väder.
06:40 Musik.	10:00 Nyheter. Yesterday. ▾
06:45 Väder med Sjörapport.	11:00 Nyheter från TT. Väder.
06:50 Musik.	11:05 Från scen till cabaret. ▾
07:00 Nyheter. Väder.	11:30 Barnradion: På väg till fåglarnas dal. ▾
07:05 Fem över Sju. ▾	11:45 Löpsedeln.
07:15 Musik.	11:55 Meddelanden.
07:30 Morgoneko med Väder ▾	12:00 Lokalradio/Melodiradio.
08:00 Nyheter från TT.	12:30 Aspeboda Network. ▾
08:05 Väder med Sjörapport.	12:45 Melodiradio.
08:15 Barnradion: Berättelser från Polen. ▾	13:00 Nyheter från TT.
08:30 Jobbet. ▾	13:05 Gäst i Sundsvallsstudion. ▾
09:00 Andlig sång med kort andakt.	13:55 Dagens Bok. ▾

**Figure 2:** Excerpt from the programming schedule of one morning in the sample set. To the left: P1. To the right: P3. Note the time stamp on the left of the content description. The data from P1 is more detailed in its notation. It is also apparent that music (“Musik”) features frequently on P1 broadcasting.

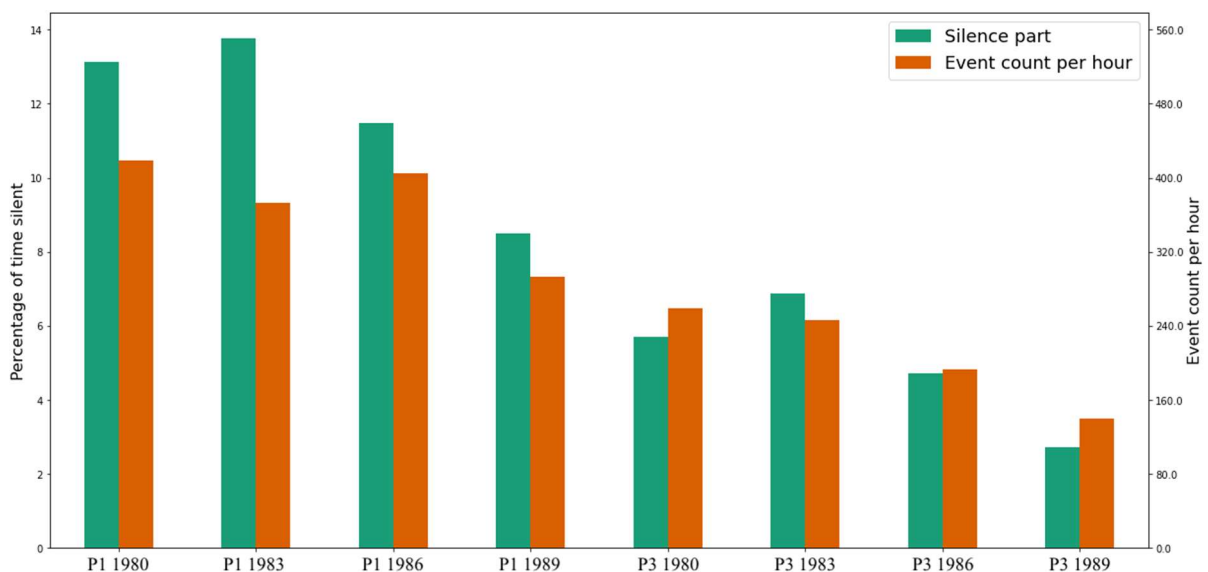
The image above is an excerpt from the archived program schedule of both channels, from the same day in 1980. The program schedule itself raises almost as many questions as it answers. Initially, P3 exhorts a much less detailed program style than P1. This highlights the unreliable nature of this source. By listening to samples from the data, it is apparent that between the slots in the P3 programming, there is a constant flow of music. This would be an evident cause of the low distribution of silences on P3. Assuming that musical content contains less silence than speech content, the difference in the distribution of silence between two channels can thus surely partly be explained by this matter. To find an indication of high levels of music behind the scarce programming schedule of P3 is a rather uncontroversial result. More interesting is the indication from the P1 schedule. As displayed in the image above, music is not absent from P1 either. This is an indication that the different distributions of silence are not only the cause of the amount of music. So too, is the fact that the amount of silence in

figure 1 is much more significantly divergent between the two channels than the number of silences. The following figure plots the distribution of silence from a sample of 5 hours of handpicked nonmusical content from each respective channel, compared with music content.



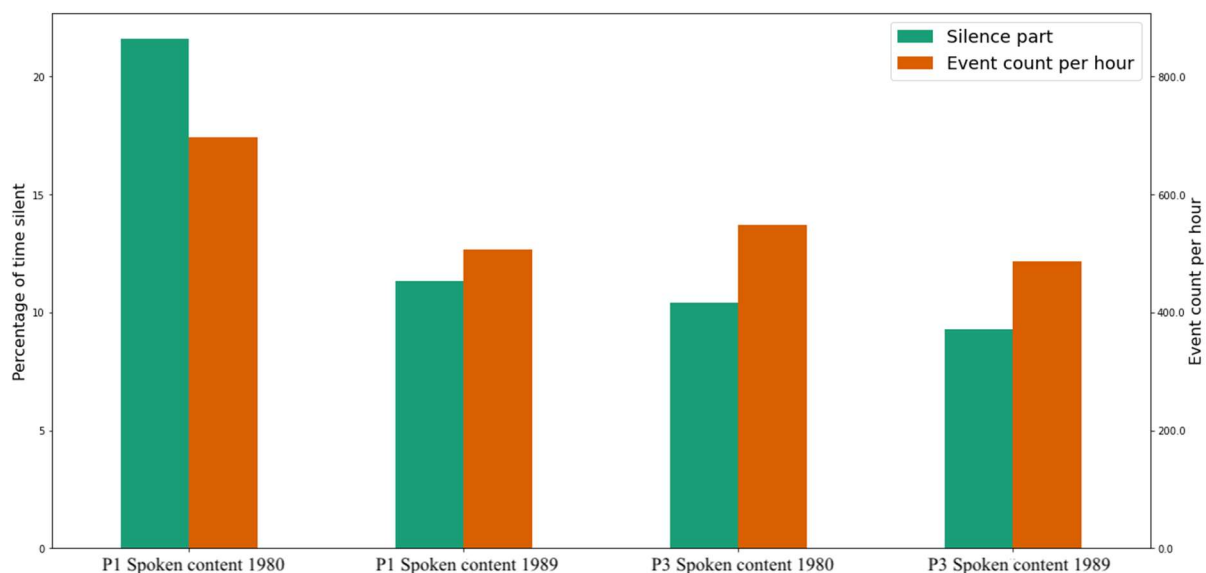
**Figure 3:** Silence measured in different types of content, displayed comparatively. The data is composed of five-hour selections extracted from the larger sample sets from 1980.

The sample data confirm the expected prediction that radio segments with musical orientation tend to display very low levels of silence. More interestingly, however, is the comparison between spoken word content on P3 and P1. The data also indicates that the distribution of silence in non-musical content differs significantly between the two channels. This result could shed light on the curious contrast between the percentage of silence and the number of occurrences above. Both results could be explained by the interpretation that the P3 content simply has a faster pace in speech and editing. The spoken content of P1 has more pauses. They also appear to be longer. Such results can be interpreted as a matter of style, rendering P3 a more rapid alternative to the slower tempo at P1. This in turn can perhaps be considered a testament to the ambition of P3 to appeal to a younger audience. Having made this conclusion, it is possible to explore the matter from a historical perspective.



**Figure 4:** Silence measured in sample sets from every third year throughout the decade. The four columns on the left side correspond to sample sets from P1 broadcasting, followed by P3 data from the same year. The sample days are extracted from the same randomized days every year.

Figure 4 displays the sample data from P1 and P3 for every third year of the decade [16]. One striking feature is the clear indication of a gradual reduction of silence in the P1 broadcasting. Comparing the beginning and end of the decade, the sample data indicate that silence has been cut almost in half. Total silent time in the sample days has fallen from 14 percent in 1980 to 8 percent in 1989. This demonstrates a clear reduction of silence throughout the historical period. Furthermore, the total silence appears to have diminished less than the number of singular occurrences. This result can be an indication that short silences have been reduced more extensively than the silences of longer duration. This is a clear indication of stylistic change, and gradually increasing similarity to the distribution of silence on P3 at the beginning of the decade. Looking at the data from P3, however, there are also indications of change. Though less striking, there is a further diminishing of both percentual amount and occurrences. This is interesting as it demonstrates a larger tendency towards diminishing amounts of silence. However, by repeating the process by which we compare the different types of content, these results can be further investigated.



**Figure 5:** Silence measured in different types of content, displayed comparatively. The data is composed of five-hour selections extracted from the larger sample sets from 1989.

Figure 5 withhold two interesting implications. On the one hand, it appears as if the overall change in silence on P3 is not explained by looking at the spoken content alone. There is a slight differentiation, but not as significant as what was displayed in the total sample data. This is perhaps not completely surprising. By assuming that the pace of the spoken content already was more effective than at P1 by the start of the century, it might not have been difficult to minimize the silence significantly further. This lends itself to the interpretation that the cause of the diminishing silence on P3 is the result of more frequent musical content. However, the data from P1 displays another tendency. This data gives a higher indication of change, giving credence to the interpretation that in fact, the spoken content has changed in pace or been rendered denser. Prior media historical scholarship has even proposed that music migrated from P1 to P3 during the 80s, resulting in effectively less music-oriented content in 1989 [17]. Would this be the case, the spoken content would need to have significantly minimized in silence in order to render the result above. There are of course other factors that could contribute to less overall silence, such as gaps between shows. Nevertheless, considering that music is an unlikely cause for the diminishing silence, the results above seem increasingly probable.

This, in turn, begs other interesting media historical questions concerning how silence can be regulated on a large scale. Yet such questions extend the scope of this article. My ambition here is

foremost to have demonstrated the capacity of a rather simple method. By means of simple automatic signal processing, it has been possible to measure the amount of silence within broadcasting and thereby discovering its value as a comparative feature in understanding radio. Regarded from the perspective of Doctor Murke, increasing amounts of silence appear to have been edited out of the transmission. As researchers, we might need to advance an interpretation that is more complex than a simple transformation from art to design. Nevertheless, the method of collecting silences has granted knowledge about a change in the radio in the Swedish public service. Whether the results, in the end, are the cause of intermonopoly influence, or the general direction towards minimization of silence will be difficult to answer. What this method can demonstrate is that the change does happen.

#### 4. Conclusion

Despite prior research describing the public service media monopoly as a differentiated system, these results indicate a strong similar direction between P1 and P3 towards a style with increasingly less silence. At a time in Swedish broadcasting history where media diversity and variation in content are achieving higher priority, silence seems to achieve a more homogenous position [18]. Silence, according to radio scholars like Andrew Crisell constitute the very backdrop against which radio events take their place, and is therefore anything less than arbitrary. The gradual decreasing values displayed in the analysis are thus not only a testament to a more homogenous approach to gaps and pauses within the content, they also demand further research. Though P3 appears to reach a threshold where silence appear to diminish less effectively, it is beyond the scope of this analysis to determine what happens after the introduction of proper commercial radio in 1993. Whether the sounds of silence keep diminishing throughout the 90s and into our days ought to be the subject of further research. It would furthermore be of great value to share comparative results from other nations, and other public service broadcasting channels.

This conclusion is in itself a methodological stance. Within digital humanities, audio data is still unexplored to the point that it remains difficult to exemplify the purpose and prospect of sound analysis [19]. However, slowly, research in media- and cultural studies is witnessing a noteworthy shift towards computational approaches to sonic material. A noticeable example is the work of the HiPSTAS (“High Performance Sound Technologies for Access and Scholarship”) research group. Tanya Clement has proposed the term “distant listening” to designate the transposition of Franco Moretti’s text-centered approach into the aural realm [20]. Through large-scale analysis, the project has achieved success in segmenting and making sound archives more searchable. The difficulties and prospects of computational approaches to radio archives have just recently started to emerge. In 2019, the matter of applying computer processing to radio archives was the topic of the European Broadcasting Union conference. In the spring of 2021, Iben Have and colleagues at the Danish University of Aarhus reached similar conclusions as Clement in a progressive study, tracking the distribution between music and speech on contemporary Danish radio [21].<sup>1</sup> What would be a reasonable disciplinary aim is to conjoin these disparate sonic excursions into a field of exchange. Yet, this requires further research allowing for comparative results and methodological advancement. Something only possible, if one, like Doctor Murke, stops throwing recorded sound, and even silences, in the garbage bin.

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