Radio Voices and the Formation of Applied Research in the Humanities

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ABSTRACT

In the 1920s, the emerging technology of radio required appropriate voices, whether in radio announcing, radio drama, or radio documentaries. This article traces this search for new radio voices with particular attention to the work conducted at the radio laboratory, the Rundfunkversuchsstelle, at the Academy of Music in Berlin, led by musicologist Georg Schünemann from 1928 to 1935. The article illuminates how this initiative integrated engineering and the humanities into new forms of laboratory research on speech and broadcasting technology. With its explicitly application-oriented agenda, the Berlin lab prompted the phoneticians, linguists, psychologists, musicologists, and language educators involved to reconsider their humanistic methods and spheres of social influence. I follow the trail that leads from these early forms of research in the "applied humanities," taking shape in Berlin during the Weimar Republic with its increasingly politicized radio studies, to Vienna in the late 1930s, and thence across the Atlantic to the Office of Radio Research at Princeton. There, research on the "voice of radio" (Theodor W. Adorno) took new directions and engaged, once again, in a fundamental debate over what applied research means to the humanities and social sciences.

I n 1928, "Pressa," the first large-scale trade fair for newspapers and electronic communications technology, opened in Cologne. At the exhibition's heart was the emerging technology of radio, to which the Westdeutscher Rundfunk contributed with the screening of a silent movie *Ein Tag im Funkhaus* (A day in the House of Radio).[1] Even without sound, the film shows there was much room for improvement in the matter of radio speech, as news announcers and radio actors still oriented themselves strongly

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1. "Ein Tag im Funkhaus," Böhm-Film, Arthur Böhm & Co, mbH Cologne (1928), WDR-Videoarchiv, ANT 116406.

toward the declamatory style of the theater stage. In the three images depicted in figure 1, one gestures histrionically, far from the microphone, another speaks so loudly that the sound-level meter swings right up to its maximum, and yet another brandishes a hand-kerchief to express his despair. But what kinds of sound, what styles of speech, what rhythmic principles, and what broadcasting technology would do justice to the medium?

Whereas broadcasters quickly found politically and commercially serviceable an-swers to these questions, researchers took a more circumspect, experimental, and reflec-tive approach. One of their ventures forms the topic of this article. Contemporaneously with the Pressa exhibition, in May 1928, the Academy of Music in Berlin opened its radio laboratory, the Funkversuchsstelle (later known as the Rundfunkversuchsstelle).

Figure 1. Film stills from "Ein Tag im Funkhaus," Böhm-Film, Arthur Böhm & Co, mbH Cologne (1928), WDR-Videoarchiv, ANT 116406.

The radio lab's initiator was Leo Kestenberg, head of the music department at the Prussian Central Institute for Education and Instruction. Kestenberg, a social democrat, campaigned for the musical education of broad segments of the population, while also supporting the Weimar Republic's artistic avant-garde.[2] These lofty aims were beyond the reach of the still poor quality of broadcasting in the 1920s. Kestenberg therefore advocated a new research center dedicated to developing a new radio music and a new way of speaking for radio.[3]

Despite the Depression and continuing inflation, the Berlin radio lab received generous funding from the Prussian Ministry of Science, Art, and Popular Education and the national broadcasting association, the Reichs-Rundfunk-Gesellschaft.[4] The music educator and deputy director of the Academy of Music Georg Schünemann was appointed to lead the lab.[5] Although Schünemann ran the radio lab for only seven years, this was enough time to set the scene for new forms of radio research.

Several studies have recently analyzed the Berlin radio lab's role in the Weimar musical avant-garde and the formation of new interdisciplinary research between engineers and musicians at the lab—exemplified most prominently by the cooperation between former telegraph engineer Friedrich Trautwein, composer Paul Hindemith, and Hindemith's student Oskar Sala. They invented an electronic musical instrument they called the Trautonium, marketed soon thereafter by Telefunken, which facilitated microtonal music. Prefiguring modern synthesizers, the Trautonium could be plugged directly into a radio amplifier.[6] Schünemann hoped that comparable collaborations would succeed in developing avant-garde instruments specially for radio and "familiarizing young musicians with the limitations, peculiarities, and possibilities of broadcasting so that they can arrive at a music out of the sense, spirit [*Geist*], and technology of radio."[7]

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2. Leo Kestenberg, "Denkschrift über die gesamte Musikpflege in Schule und Volk" (1923), in *Leo Kestenberg: Gesammelte Schriften*, ed. Wilfried Gruhn (Freiburg: Rombach, 2009), 1:149–86.

3. Preußisches Ministerium für Wissenschaft, Kunst und Volksbildung, June 11, 1926 (signed Lammers), to Direktor der Akademischen Hochschule für Musik, UdK-Archiv, 1b/1 (Generalia).

4. Dietmar Schenk, *Die Hochschule für Musik zu Berlin: Preussens Konservatorium zwischen romantischem Klassizismus und neuer Musik, 1869–1932/33* (Stuttgart: Franz Steiner, 2004), 260–61.

5. Ibid., 257–72.

6. Ibid.; Nils Grosch, *Die Musik der Neuen Sachlichkeit* (Stuttgart: Metzler, 1999), 205–13; Joachim Stange, *Die Bedeutung der elektroakustischen Medien für die Musik im 20. Jahrhundert* (Pfaffenweiler: Centaurus, 1989), 85–101; Dietmar Schenk, "Paul Hindemith und die Rundfunkversuchsstelle der Berliner Musikhochschule," *Hindemith Jahrbuch/Annales Hindemith* 25 (1996): 179–94; Benedikt Brilmayer, "Das Trautonium: Prozesse des Technologietransfers im Musikinstrumentenbau" (PhD diss., Universität Augsburg, 2015); Myles W. Jackson, "Trautonium," in *Surprise: 107 Variations of the Unexpected*, ed. Mechthild Fend et al. (Berlin: Max Planck Institute for the History of Science, 2019), 175–77.

7. Georg Schünemann, "Die Aufgaben der Funkversuchsstelle," *Jahresbericht der Staatlichen Akademischen Hochschule für Musik in Berlin*, October 1, 1927–September 30, 1928, 12.

That Schünemann accorded such centrality to the notion of *Geist* in his project is of particular relevance for the present article. The German word *Geist* has two meanings: "spirit" and "mind." The first brought Schünemann's agenda close to the "ether paradigm" of early radio: leading physicists of the 1920s took up the nineteenth-century notion of a "world ether" and postulated that it could act as the medium for the propagation of radio waves.[8] The ether paradigm gave rise to a wide range of occult and spiritualist speculations at the time, with radio regarded as a technology capable of transmitting the "world spirit," or "the spirit of the Weimar Republic" that was proclaimed in Germany in both nationalistic and liberal circles.[9]

By referring to the "sense, spirit [*Geist*], and technology of radio," Schünemann may have hinted at this paradigm, though he was not much of a spiritualist. Schünemann's objectives for the Berlin radio lab were rather in line with Ernst Cassirer's philosophy of technology, as outlined in a 1930 essay on form and technology edited by Kestenberg.[10] In this essay, Cassirer took offense at the spiritualist discourse on technology of his time. For him, there was no "spirit of technology," because technology was man-made, a "creature of the human spirit."[11] He therefore called for a new attention to the formative and expressive spirit of man that flows into technology and the arts. By establishing a "close working community" of engineers and artists for the formation of a new radio art, Schünemann was giving a practical twist to Cassirer's philosophical aspirations.[12]

As a professor of musicology, however, Schünemann was determined to tie radio research not only to technology and art, but also to humanities expertise. The involvement of the humanities in his project becomes particularly apparent if we shift the perspective from the Berlin lab's work on radio music to that on radio speech. As a well-preserved archive at the University of the Arts in Berlin reveals,[13] phoneticians, linguists, psychologists, and language educators were involved to a remarkable extent in the lab's research on radio speech. Schünemann's remark about the "spirit [*Geist*] of radio" may thus also be considered as a reference to the disciplines that Berlin-based

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8. Wolfgang Hagen, *Das Radio: Zur Geschichte und Theorie des Hörfunks—Deutschland/USA* (Munich: Wilhelm Fink, 2005), 72.

9. Hagen, *Das Radio*, 37–142.

10. See Leo Kestenberg, "Vorwort," in *Kunst und Technik: Aufsätze*, ed. Leo Kestenberg (Berlin: Volksverband der Bücherfreunde, 1930), 7–12. On Kestenberg's agenda, see Schenk, *Hochschule für Musik zu Berlin*, 257–58.

11. Ernst Cassirer, "Form und Technik," in *Kunst und Technik: Aufsätze*, ed. Leo Kestenberg (Berlin: Volksverband der Bücherfreunde, 1930), 41.

12. Georg Schünemann, "Von der Arbeit der Rundfunkversuchsstelle," *Funk: Die Wochenschrift des Funkwesens* 30 (1929): 131.

13. UdK-Archiv, Bestand 1b (Rundfunkversuchsstelle).

philosopher Wilhelm Dilthey had clustered in the late nineteenth century under the umbrella of *Geisteswissenschaften*—the humanities, or, literally, sciences of the mind.[14] To search for the spirit of radio was also to breathe the "spirit" of the *Geisteswissenschaften* into radio.

In what follows, I outline the structures and contents of this endeavor, showing that the Berlin lab's work on radio speech built on research traditions that had taken shape in Berlin earlier in the century: substantively, Schünemann drew on new trends of laboratory research in the humanities, introduced in phonetics, psychology, and comparative musicology since the turn of the century, that adapted the practices of the laboratory sciences to the needs of what I call "laboratory humanities." Structurally, the Berlin radio lab was also inspired by the emergence of new applied research in Germany's engineering industry of the 1920s, prompting its members to define applied research in the humanities. Current scholarship has paid little attention to the "applied humanities," the immediate or delayed application of research by humanities scholars in the first half of the early twentieth century. The Berlin radio lab's short history is one such case. What aesthetic and political challenges, its members asked, were entailed by the development of new radio voices, and how would humanities scholars balance freedom of research with social responsibility?

In the final section of the article, I follow the trail that leads from these questions, raised in Berlin during the Weimar Republic with its increasingly politicized radio studies, to Vienna in the late 1930s, and thence across the Atlantic to the Office of Radio Research (ORR) at Princeton. At the ORR, research on the "voice of radio" prompted another wide-ranging debate over scientific and humanistic methods, applications, and domains of social responsibility.

LAB CULTURES IN THE HUMANITIES

When Georg Schünemann started to direct the radio lab in 1928, he initially used it as an "observation office" to compare the technical and artistic achievements of radio stations worldwide.[15] In radio announcing and drama, he attributed a leading role to broadcasters in Prague, Warsaw, and Rome, which were "highly instructive even if one does not understand the language, for their special merit is to have brought out so strongly

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14. Wilhelm Dilthey, *Introduction to the Human Sciences*, trans. Michael Neville and ed. Rudolf A. Makkreel and Frithjof Rodi (Princeton, NJ: Princeton University Press, 1989), 57–58.

15. Georg Schünemann, "Bemerkungen zum Plan einer Rundfunkversuchsstelle" (undated), UdK-Archiv, 1b/1 (Generalia).

the musical, directly intelligible expressiveness of language."[16] Simply imitating other broadcasting aesthetics was not enough, however. The Berlin radio lab was to become a site for research and experimentation nurturing a "radio art" that was "based upon the inner and outer laws of broadcasting."[17]

In these experimental aims, Schünemann drew inspiration from his long-time mentor, the philosopher and psychologist Carl Stumpf. Stumpf was appointed professor at the University of Berlin on philosopher Wilhelm Dilthey's advice in the 1890s, and he played a significant role in the development of the humanities of his day. From 1894 to 1921, he directed the Institute of Psychology in Berlin, which expanded over the years from a cramped university venue in Dorotheenstrasse to a large laboratory in the Berlin City Palace. Stumpf, the "philosopher in the lab," adopted some of the experimental methods of the natural sciences to the needs of the "laboratory humanities."[18] Stumpf was certainly not the first and only humanities scholar at the time to found a laboratory. The late nineteenth century had witnessed a few eminent initiatives in this respect, among them Wilhelm Wundt's laboratory for experimental psychology at the University of Leipzig and the Abbé Pierre-Jean Rousselot's laboratory for experimental phonetics at the Collège de France in Paris. Yet under Stumpf's guidance, the Berlin Institute of Psychology became a renowned center for many new lines of laboratory research in the humanities at once, including comparative musicology, experimental aesthetics, experimental pedagogy, experimental phonetics, sensory psychology, and what would later be called "Gestalt psychology."[19]

Stumpf and his colleagues also made extensive use of new media technologies, whether phonographs, telephones, or measuring devices. The Royal Prussian Phonographic Commission that Stumpf headed during the First World War, for instance, recorded and kept for later analysis the music and languages of prisoners of war interned in Berlin—a politically questionable initiative, to which Georg Schünemann also contributed with studies of folk song.

After the war, Stumpf consolidated the Phonogrammarchiv at the University of Berlin, until it was acquired by the Prussian state in 1923 and, at the suggestion of

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16. Schünemann, "Bemerkungen."

17. Georg Schünemann, "Die neue Funkversuchsstelle," *Funk: Die Wochenschrift des Funkwesens* 20 (1928): 154.

18. Riccardo Martinelli, "A Philosopher in the Lab. Carl Stumpf on Philosophy and Experimental Sciences," *Philosophia Scientiæ: Travaux d'histoire et de philosophie des sciences* 19-3 (2015): 23–43.

19. Mitchell G. Ash, *Gestalt Psychology in German Culture, 1870–1967: Holism and the Quest for Objectivity* (Cambridge: Cambridge University Press, 1995); Margarete Pratschke, *Gestaltexperimente unterm Bilderhimmel: Das Psychologische Institut im Berliner Stadtschloss und die Avantgarde* (Munich: Fink, 2016).

Schünemann, formally transferred to the Academy of Music until 1934.[20] In parallel, the phonetician Wilhelm Doegen—another one-time member of the Phonographic Commission—established the Lautabteilung (sound department) of the Prussian State Library in Berlin. Doegen's vision was to persuade every Berlin-based scientific and scholarly discipline to carry out phonographic research, and to make the sound department a laboratory for experimental phonetics and linguistics, various languages and literatures, dialectology, musicology, ethnology and folklore studies, anthropology, zoology, medicine, psychology, and criminology.[21] Again, Schünemann assisted the sound department as an advisor on music. He would have liked to absorb this project into the Academy of Music, as well, but had to make do with a loose cooperation instead.[22]

When the radio lab opened in 1928, therefore, Schünemann could build on firm foundations in Berlin: the status of the *Geisteswissenschaften* in the academic landscape had been generally strengthened. Besides the traditional humanities disciplines, new disciplines and lines of research were taking shape. In addition, new methods of laboratory research were beginning to take root, driven by humanities scholars who attended closely to the recording and communications technologies available and adjusted them to fit their own research objectives. Taking inspiration from these developments, Schünemann explicitly aimed at integrating humanities scholars from diverse disciplines into his initiative and called it a "laboratory" or "experimental station" (*Versuchsstelle*) for radio research. But the radio lab took an important step further than Stumpf and Doegen: its research agenda was exclusively application oriented.

APPLIED RADIO RESEARCH

Schünemann's radio lab aimed to explore the technological and linguistic applications of audio communication and to integrate engineering and the humanities into new forms of applied research, long before the catchphrase "applied humanities" entered science policy in the second half of the twentieth century. To be sure, applied research has been conducted in the humanities ever since; and the early twentieth century saw the emergence of the field of "applied psychology" (with Harvard-based psychologist Hugo Münsterberg as its most eminent proponent, and the 1919 foundation of the

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20. Schenk, *Hochschule für Musik zu Berlin*, 249–56. Lars-Christian Koch, Albrecht Wiedmann, and Susanne Ziegler, "The Berlin Phonogramm-Archiv: A Treasury of Sound Recordings," *Acoustical science and technology* 25, no. 4 (2004): 227–31.

21. See Viktoria Tkaczyk, "Archival Traces of Applied Research: Language Planning and Psychotechnics in Interwar Germany," *Technology and Culture* 60, no. 2 (2019): 64–95.

22. Schenk, *Hochschule für Musik zu Berlin*, 250.

International Association of Applied Psychology under its previous name, the International Association of Psychotechnics).[23] But the first to talk about "applied humanities" more generally was the Anglicist Erwin R. Steinberg, who, in 1974, was dean of the newly founded Diedrich College of Humanities and Social Sciences at the Carnegie Institute of Technology and gave a reason for the world's need of the humanities by explicitly stressing the potential application of a wide range of humanities knowledge.[24] Initiatives such as Schünemann's radio lab in Berlin, however, facilitated interdisciplinary research in the "applied humanities" long before and *avant la lettre*.

In this undertaking, Schünemann drew inspiration from the many laboratories of applied electroacoustics that had arisen worldwide and across Germany after the end of the First World War, in technical universities, political institutions, and industrial concerns, to provide a firmer scientific footing for inventions such as the telephone, the microphone, and the loudspeaker and to optimize them for the market.[25] Most influential in Germany were the research laboratories of the electrical engineering company Siemens & Halske, located at the time in the Siemensstadt settlement in Charlottenburg, in the north of Berlin. In 1928, the Allgemeine Electricitäts-Gesellschaft (AEG) founded its own research laboratory in Berlin, and, the same year, AEG and Siemens & Halske together founded Klangfilm GmbH to compete with American companies in sound motion picture technology. At the same time, Carl Lindström AG was developing a global market for gramophone technology; Berlin also hosted the Telegraph Research Office, attached to the Reichspost, and in 1930 the Heinrich Hertz Institute for Oscillation Research (HHI), affiliated with the Technical University Berlin, was founded to conduct large-scale research in electroacoustics.

Based next door to the HHI in Charlottenburg, Schünemann envisioned a project of similarly ambitious scope for broadcasting. Accordingly, the radio lab's advisory board included representatives not only of the founding institutions but also of the National Ministry of Posts and Telecommunications, the HHI, and Berlin's two new radio broadcasters, Deutsche Welle and Berliner Funk-Stunde. There was also close cooperation with industry, especially Siemens & Halske. Thanks to the Siemens collaboration, the

23. Matthew Hale, *Human Science and Social Order: Hugo Münsterberg and the Origins of Applied Psychology* (Philadelphia: Temple University Press, 1980).

24. Erwin R. Steinberg "Applied Humanities?" *College English* 35, no. 4 (1974): 440–50.

25. Roland Wittje, *The Age of Electroacoustics: Transforming Science and Sound* (Cambridge, MA: MIT Press, 2016), 115–71. Most famous in this respect is the applied research on telephone communication, conducted by psychologist Harvey Fletcher and his team at Bell Labs, the laboratory facilities of the American Telephone and Telegraph Company (AT&T). See Jonathan Sterne, *MP3: The Meaning of a Format* (Durham, NC: Duke University Press, 2012), 32–60.
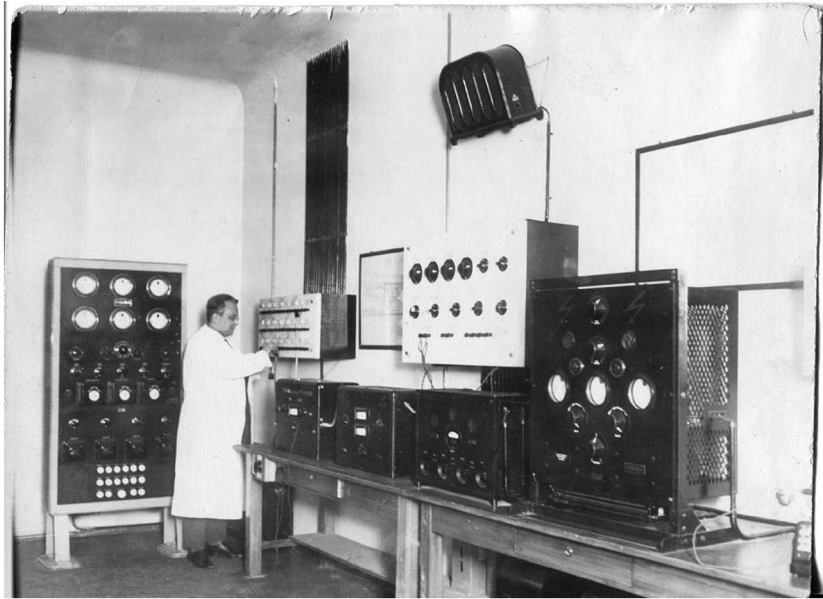
Figure 2. The radio lab control room with the amplification system. Archiv der Universität der Künste, Bestand Rundfunkversuchsstelle, photo 1, 71. Color version available as an online enhancement.

Academy's concert hall boasted a large-scale loudspeaker system connected by telephone to the classrooms, the recording and amplifier room, and a control center in the attic (fig. 2).[26]

According to Schünemann, around three thousand people were involved in the radio lab in its first year.[27] Schünemann's own role was largely that of a matchmaker, bringing together members of different professions—musicians, actors, playwrights, journalists, electroacousticians, phoneticians, speech educators, psychologists, and educationists—for the purposes of research. For this interdisciplinary research community, Schünemann sketched out an ambitious research agenda. Among other things, he identified various, necessarily overlapping, fields of applied research on speaking for radio: the improvement of radio technology, speech studies, and training for microphone speech.[28]

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26. Schünemann, "Die neue Funkversuchsstelle," 153. The rental contracts between the Rundfunkversuchsstelle and Siemens & Halske are in the UdK-Archiv, 1b/1 and 3.

27. Georg Schünemann to Reichsrundfunkgesellschaft, March 3, 1930, UdK-Archiv, 1b/1 (Generalia).

28. Georg Schünemann, "Die Aufgaben der Funkversuchsstelle," *Funk: Die Wochenzeitschrift des Funkwesens* 3 (1929): 10.

IMPROVEMENT OF RADIO TECHNOLOGY

In one of his essays on the Berlin radio lab, Schünemann contended that any systematic understanding of radio speech and its often unwanted modification by microphones, telephone lines, amplifiers, headphones, and speakers depended on the precise analysis of speech tone patterns.[29] This placed the lab's work on broadcast speech firmly in the tradition of Carl Stumpf's 1926 study *Die Sprachlaute* (Speech sounds), the outcome of almost three decades of work at the Institute of Psychology in Berlin.[30] Unlike Stumpf with his long-term, pure research on speech sounds, however, Schünemann aimed to produce immediately applicable knowledge and technologies.

Schünemann's prime example in this respect was the development of a search tone method for the testing of microphones at the Berlin radio lab, based explicitly on a series of experiments that Stumpf had conducted with his so called "interference apparatus"[31] from 1913 onward. Stumpf's device (fig. 3a) exploited the phenomenon of destructive interference: the mutual cancellation of two sound waves with the same frequency and amplitude at phase shifts of half a wavelength. Stumpf tried to determine and "destroy" partials of a speech sound using this principle.[32] He first hypothetically identified a vowel tone's partials, then led that tone through the interference apparatus, made of long metal tubes and diverse branch pipes, each of which was a quarter wavelength of one of the partials—so that when the respective partial moved back and forth through the branch pipe, interference was generated. If the original tone was cancelled out completely through this principle, its partials structure was confirmed. Conversely, Stumpf could use the apparatus to produce synthetic sounds by adding partials produced by organ pipes and fed in through the tubes; and with the help of the apparatus he also examined how humans perceive speech sounds (see Julia Kursell's contribution to this theme issue).[33]

Inspired by Stumpf's use of the interference apparatus to create synthetic sounds, Martin Grützmacher, an acoustician from the national telegraphy department, presented a "new method of sound analysis" in 1927.[34] Grützmacher worked with combination

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29. Schünemann, "Aufgaben der Funkversuchsstelle," (1929), 9.

30. Carl Stumpf, *Die Sprachlaute: Experimentell-phonetische Untersuchungen nebst einem Anhang über Instrumentalklänge* (Berlin: Springer, 1926).

31. Stumpf, *Die Sprachlaute*, 36–76.

32. Stumpf, *Die Sprachlaute*, 37.

33. Stumpf, *Die Sprachlaute*, 169–75. See also Julia Kursell, "Musikwissenschaft am Berliner Institut für Psychologie: Carl Stumpf und der Interferenzapparat," in *Musikwissenschaft 1900–1930: Zur Institutionalisierung und Legitimierung einer jungen akademischen Disziplin*, ed. Wolfgang Auhagen, Wolfgang Hirschmann, and Tomi Mäkelä (Hildesheim: Olms, 2017), 73–90.

34. Martin Grützmacher, "Eine neue Methode der Klanganalyse," *Elektrische Nachrichtentechnik* 4, no. 12 (1927): 533–45.
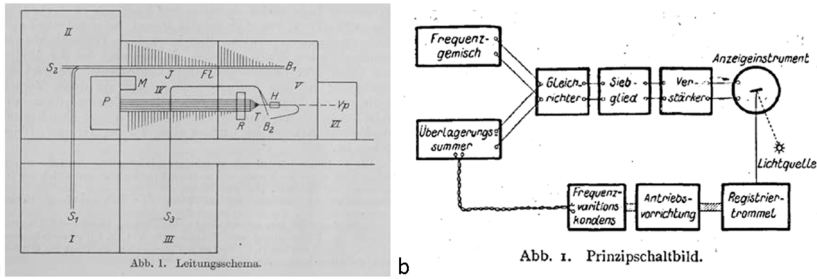
Figure 3. Carl Stumpf's experimental setting (using the principle of destructive interference) was taken up by Martin Grützmacher's electric method of sound analysis (using an "interference buzzer"). Sources: *a*, Stumpf, *Die Sprachlaute* (1926), 44; *b*, Grützmacher, "Eine neue Methode der Klanganalyse" (1927), 534. Color version available as an online enhancement.

tones: summation and difference tones arising from the interference of two sinusoidal frequencies. For this purpose, he basically transformed Stumpf's device into an electric circuit (fig. 3b). He first converted the sound signal (already a frequency mix) into electrical voltage and then used an "interference buzzer" to modulate search frequencies with alternating currents—known in electroacoustics since then as a search tone—onto the incoming signal.[35] Through rectification and amplification, a new combination tone was formed from one partial of the incoming signal and one search tone. By subtracting the search voltage from this combination tone, it was possible to discover the amplitude and frequencies of the signal's partial.

Based on these experiments, in turn, Erwin Meyer, head of acoustics at the HHI and a teacher at the radio lab, found a way to determine nonlinear distortions in microphones.[36] Meyer first integrated a carbon microphone into Grützmacher's circuit arrangement, into which he then simultaneously played a sound signal and an interference buzzer that generated search frequencies with alternating current. Meyer realized that in the case of closely adjacent search frequencies, they themselves became an interference factor and produced distortions in the microphone. He followed this up by experimenting with search frequencies in the form of a beat produced by two rapidly alternating primary tones, p and q. Oscillation impedances arose analogously in the microphone and, in a rapid sequence, were juxtaposed with the next impedance and resulted in not two subsequent tones but one difference tone, $p - q$. The presence of such difference tones supplied information about the nonlinearity of a given microphone.

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35. Grützmacher, "Eine neue Methode der Klanganalyse," 534.

36. Erwin Meyer, "Über eine einfache Methode der automatischen Klanganalyse und der Messung der Nichtlinearität von Kohlemikrophonen," *Elektrische Nachrichtentechnik* 5, no. 10 (1928): 400.

Meyer's search tone methods soon gained prominence in sound engineering and found their way into acoustics textbooks.[37] Although Schünemann was not directly involved in the experiments, he proudly recounted his colleagues' use of Stumpf's sound analysis to develop new methods of microphone testing. Schünemann, then, helped test microphones in his singing classes (fig. 4). His correspondence with the manufacturer Eugen Reisz also reveals his role in facilitating Meyer's research. Reisz's company and Siemens & Halske had supplied carbon microphones for the tests without charge, but Meyer's results turned out to be rather unflattering for Reisz, so the latter called for a halt to the work.[38] Schünemann, however, responded that "we neither can, nor wish to, spread any kind of propaganda for this or that product, since we are a scientific artistic institute and must serve solely the question at hand."[39]

Schünemann's emphasis on the pureness of the Berlin radio lab's research is all the more remarkable, as he and his colleagues nevertheless hoped for a wide-ranging application of their work in radio broadcasting. They were well aware, however, that there was still need for intensive interaction with radio actors and news announcers to in fact render their research applicable. In 1929, Meyer started to give courses for radio announcers on electroacoustics at the HHI and the Berlin radio lab as a practical introduction to the potentials and weaknesses of contemporary broadcasting technology. Reflecting on these courses, Meyer stressed that technological know-how alone was not enough to compensate for inferior acoustic quality in recording and playback devices; a well-founded practice of speaking was equally important.[40] With this, Meyer clearly echoed Schünemann's wish to facilitate further research on radio speech at the intersection of technological engineering and humanities scholarship.

SPEECH STUDIES

To establish a specific speech culture for radio, argued Schünemann, research on broadcasting technology was as important as studying particular "laws of speaking for radio."[41] The latter was the domain of *Sprechkunde* (speech studies). "Applied speech

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37. See Erwin Meyer and Ernst-Georg Neumann, *Physikalische und Technische Akustik: Eine Einführung mit zahlreichen Versuchsbeschreibungen*, 3rd ed. (Wiesbaden: Springer, 1979), 236–39.

38. Correspondence Eugen Reiß and George Schünemann, May 1–May 15, UdK-Archiv, 1b/11, fols. 170–76.

39. Schünemann to Reiß, May 12, 1928, UdK-Archiv, 1b/11, fol. 173.

40. Erwin Meyer, "Die Elektroakustik in der Vortragsreihe an der Musikhochschule," in Georg Schünemann, "Berlin eröffnet seine Funk-Akademie," *Funk: Die Wochenzeitschrift des Funkwesens* 41 (1929): 187–88; Erwin Meyer, "Anfängerkursus Elektroakustik (Tätigkeitsbericht)," UdK-Archiv, 1b/15.

41. Schünemann, "Aufgaben der Funkversuchsstelle," (1929), 11.

Figure 4. Microphone tests at the radio laboratory (with Georg Schünemann, left). Archiv der Universität der Künste, Bestand Rundfunkversuchsstelle, photo 1, 41.

researchers," or "speech educators," were usually trained in both acting and humanities disciplines such as phonetics or literary studies.[42] At the time, they were increasingly employed in universities to improve students' public speaking skills. In the universities, they held not professorships but precarious teaching posts.

Given this ambivalent position, Schünemann saw a chance to strengthen the hand of the profession and win speech educators' support for new forms of research and teaching on radio speech. Among the courses taught at the radio lab from October 1929, six were dedicated to radio speech, held in the Academy of Music's attic. Although the courses were open to the general public as well as university students, Schünemann stressed their scientific orientation; the teachers were required first of all to analyze the "composition and structure" of radio speech.[43]

This objective was especially dear to the heart of the speech educator Vilma Mönckeberg-Kollmar. In her course "The Art of Speaking at the Microphone," Mönckeberg-Kollmar stressed that radio's "disembodied voice" must imitate neither

42. The term "angewandte Sprechkunde" (applied speech studies) was coined by Erich Drach. Drach, *Die redenden Künste* (Leipzig: Quelle & Meyer, 1926), 83. See Reinhart Meyer-Kalkus, *Stimme und Sprechkünste im 20. Jahrhundert* (Berlin: Akademie-Verlag, 2001), 126–30.

43. Schünemann, "Die neue Funkversuchsstelle," 154.

theatrical declamation nor general public speaking: "The suppression of the visible personality is the extraordinary aspect of radio transmission. A tremendous matter for an era that is entirely attuned to vision and the personality cult."[44] Mönckeberg-Kollmar proposed to focus on "the pure execution of the work, what the speaker makes of the language, how he forms language: the rhythm, structure, melody, the construction of the whole. It becomes apparent whether he is working creatively 'in language' just as the sculptor does in clay, the painter in color. . . . To find this pure art of speaking will be the task of the new Radio School."[45] Although the radio lab promoted itself as an initiative of applied research, Mönckeberg-Kollmar thus hesitated to offer all-too-easily applicable instructions for speaking on air, pleading, instead, for the establishment of a new field of research on radio speech.

The radio lab's speech research and training, in other words, aspired less to establish standards than to sculpt speaker personalities. This goal sat somewhat uneasily with the programmatic *Rundfunkaussprache* (Radio pronunciation) published around the same time by the linguist Theodor Siebs. To be sure, this textbook laid down few new regulations: Siebs had already published the standard reference work on pronunciation in 1898, the much-reprinted rulebook *Die Deutsche Bühnenaussprache* (German stage pronunciation), and vaunted its success as a guide for theaters, schools, and broadcasting alike.[46] Only in the matter of foreign words did Siebs now expand his earlier work, calling for foreign terms to be assimilated into German.[47] But Siebs regarded radio as the ideal medium for his zeal to standardize the German language. "One must never forget," he wrote, "that radio can exert a prodigious effect on the listener and, through its language use alone, constitutes a significant cultural power."[48] Siebs thus touched on expansionist foreign policy aims, also describing the standard language as a "bond that firmly binds together Germans from inside and outside the current borders of the state." Radio must offer a platform to this "most faithful mirror of culture" and disseminate standard German among non-German listeners as well.[49] Siebs's words indicate a move from speech education to demagoguery and propaganda. They mirror a discourse on the collective impact of radio as initiated at the time by the abovementioned spiritualist theories, as part of the "ether paradigm" of radio, and taken up

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44. Vilma Mönckeberg-Kollmar, "Die Anonymität des Rundfunks," in Georg Schünemann, "Berlin eröffnet seine Funk-Akademie," *Funk: Die Wochenzeitschrift des Funkwesens* 41 (1929): 190.

45. Mönckeberg-Kollmar, "Die Anonymität des Rundfunks," 190.

46. Theodor Siebs, *Rundfunkaussprache: Im Auftrag der Reichs-Rundfunk-Gesellschaft* (Berlin, 1931), 3.

47. Ibid., 4–7.

48. Ibid., 2–3.

49. Ibid., 2.

by the sociologist Leopold von Wiese and others, who pointed, more specifically, to the new medium's effects on Germany's social structure.[50]

Speech educators at the Berlin radio lab took a very different view. Quite in line with Mönckeberg-Kollmar, the experienced broadcaster Karl Würzburger also rejected the aim of establishing a unified art of speaking. On the contrary, he wrote that, "in order to act as a vibrant mediator between its millions of listeners, radio must bring to the microphone the lay speaker—the man of practical life, the laborer, technician, researcher. . . . The audio drama of everyday life in its myriad forms and sounds is the driving force in even the simplest radio delivery."[51] Instead of clear-cut rules, therefore, Würzburger advocated reducing inhibitions during radio speech. The "peculiarity of microphone speech," he argued, was revealed mainly through conscious listening and the experimental search for one's own, individual radio voice.[52] Würzburger even suggested renaming his courses "instruction in the psychology of speaking at the microphone" and introducing broadcast speech as a new area of research and teaching in psychology.[53]

TRAINING FOR MICROPHONE SPEECH

Another important figure teaching at the Berlin radio lab was Alfred Braun, Funk-Stunde's most famous announcer and later the head of its drama department. Braun insisted that speech education was not a matter of voice training alone. His course covered radio genres; the rhythm, dynamics, and tempo of speech; "the treatment of vowels and consonants"; and more generally the "creative design of speech at the microphone." Above all, Braun's practical seminar was intended to sharpen the ear: "We tried to learn more by listening to a voice, so as to understand through listening that the voice, the language, the word, spoken delivery hold greater potential than has ever been realized by those who see, by those who do not depend on listening alone."[54]

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50. Leopold von Wiese, "Die Auswirkung des Rundfunks auf die soziologische Struktur unserer Zeit" (1930), in *Aus meinem Archiv: Probleme des Rundfunks*, ed. Hans Bredow (Heidelberg: Vowinckel, 1950), 98–111. In 1937, the Reichsrundfunkkammer initiated another large-scale project for a "Dictionary of Good Colloquial German," which was never completed. Despite the seemingly unified mode of speaking in Nazi radio, there was thus no binding handbook or reference work. On the "Dictionary of Good Colloquial German" see Ernst Runschke, "Rundfunk und Aussprache," *STUF—Language Typology and Universals* 1, no. JG (1948): 214–50.

51. Karl Würzburger, "Manuskript und freie Rede," *Funk: Die Wochenschrift des Funkwesens* 41 (1929): 189.

52. Würzburger, "Manuskript und freie Rede," 189.

53. Karl Würzburger, "Zu den Lehrgängen über den 'Rundfunkvortrag,'" December 13, 1930, UdK-Archiv, 1b/15.

54. Alfred Braun, "Tätigkeitsbericht über das vergangene Jahr in der Rundfunkversuchsstelle," December 12, 1930, UdK-Archiv, 1b/15.

In order to optimize speaking techniques, posture, and distance from the microphone, the radio lab teachers also used new technologies, including the "Stille wire." The steel wire magnetic recorder, developed by German physicist and chemist Curt Stille, was the precursor to magnetic tape as patented by Ludwig Blattner soon afterward. At the time, Stille was working for the telegraphy cartel Telegraphie-Patent-Syndikat. He initially let the radio lab use his "steel wire machine" for speech exercises without charge, though later his increasingly successful companies demanded financial compensation.[55] Students at the radio lab recorded their voices with the Stille device and used the recordings to constantly improve their radio delivery.

In 1929, with the advent of X-ray cinematography—a procedure by which X-rays were converted into visible light through a fluorescent screen, then filmed—Schünemann approached the Berlin radiologist Victor Gottheiner to ask how the procedure might be applied in teaching speech.[56] Gottheiner had never considered the question, but two years later he told Schünemann of his experiments in X-ray film at the Charité Hospital, confirming that it was "an appropriate instruction method for training the voice . . . among both the normal (singers, announcers) and the pathological (stutterers, deaf-mutes)."[57] Close collaboration ensued between Gottheiner, Schünemann, and the technician Heinz Grosse, who soon patented a sound-on-disc process to add synchronized sound to moving X-ray images.[58] Experiments were carried out in Gottheiner's radiology department at the municipal hospital in Pankow, Berlin.[59] Every detail of radio speech was illuminated, from the shape of the mouth to the changing position of the surface and base of the tongue, the palate, the larynx, and the epiglottis. The researchers must have been aware of the health risks involved, since subjects had to sign a declaration absolving the radio lab from liability for any complications.

The radio lab promoted its sound films widely, and companies in the United States and Japan approached Schünemann to market the technology,[60] but unfortunately the films have not survived. What does remain is the paper trail of an intellectual property dispute that arose with Robert Janker, head of surgical radiology at Bonn's university

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55. The relevant correspondence between 1928 and 1930 is in the UdK-Archiv, 1b/11, fols. 40, 41, 51, 177.

56. Schünemann to Gottheiner, April 29, 1929, UdK-Archiv, 1b/8.

57. Gottheiner conducted these experiments with the phoniatrist Hermann Gutzmann at the Charité. Gottheiner to Schünemann, May 1, 1929, and January 23, 1931, UdK-Archiv, 1b/8.

58. Patent D.R.P. 562353. The process is described in a letter from Schünemann to the Dresden company Zeitz-Ikon, January 19, 1932, in UdK-Archiv, Bestand 1b/8.

59. Georg Schünemann, draft letter, ca. 1934, in UdK-Archiv, 1b/8 (Röntgentonfilm).

60. See, for example, the letter from the Hanover agent Friedrich von Koschitzky to Georg Schünemann, June 29, 1932, UdK-Archiv, 1b/8.
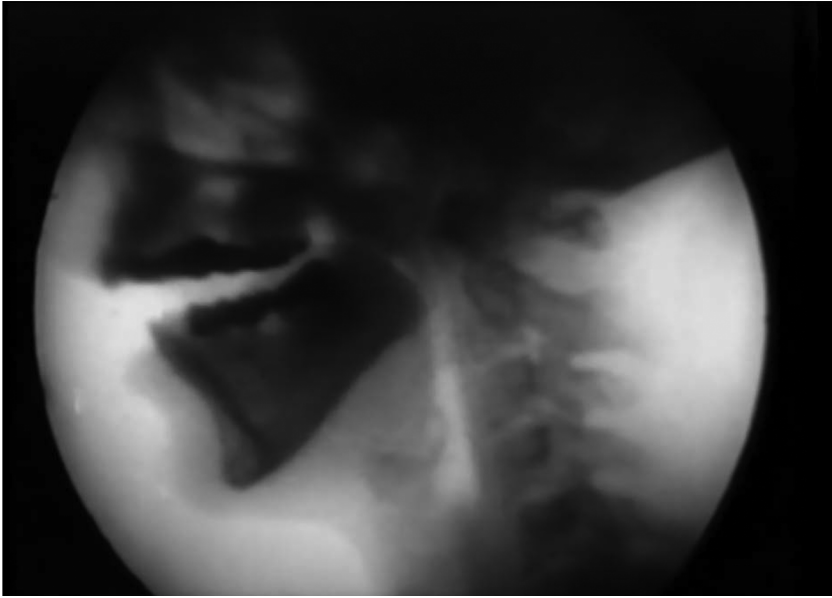
Figure 5. Still from the short documentary teaching film "Röntgentonfilm der Sprache," directed by Prof. Dr. Dr. h.c. Robert Janker at the Röntgen- und Lichtinstitut Bonn, (1937), 00:14:15. Digital version provided by the Institute for Media Studies, Ruhr-Universität Bochum.

hospital, over the technique of optical sound in X-ray cinematography.[61] Janker and his collaborator, the chemicals conglomerate IG Farben, succeeded in claiming credit. With an implicit nod to the radio lab's work, in 1937 Janker produced the educational film *X-ray Sound Film of Speech* (fig. 5), parts of which were screened at the International Film Festival in Venice that year.[62]

Hence, in search of new forms of radio speech, engineers and humanities scholars at the Berlin lab experimented with the "sense, *Geist*, and technology of radio." Schünemann and his colleagues based the construction of new broadcasting technologies on previous research in the field of phonetics and psychology, while also cooperating intensively with radio actors, news announcers, and speech educators. The latter made, in turn, extensive use of the speech recording technologies available at the time (Stille wire, X-ray). These did not serve purely to examine the process of speaking and listening, as was the case at Stumpf's Institute of Psychology. The radio lab's goal was to

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61. I. G. Farbenindustrie to Schünemann, March 18, 1933 (signature illegible); Schünemann to I. G. Farbenindustrie, January 24, 1933, UdK-Archiv, 1b/8.

62. R. Janker, "Röntgentonfilm der Sprache: Begleitheft zum Hochschulfilm C 150," Berlin: Reichsstelle für den Unterricht, 1937, Bundesarchiv, Abtl. Filmarchiv.

train, shape, and invent future radio voices—aiming at a fundamental reform of speech culture in the Weimar Republic.

IMMEDIATE AND DELAYED APPLICATIONS

Some have credited the Berlin radio lab with having become, in the brief span of its existence, a "nascent college of media."[63] Certainly, the radio lab was a magnet for playwrights, actors, musicians, composers, teachers, and journalists. Many hoped to train for a new career in radio in view of the Weimar era's growing unemployment. Faced with crowds of applicants, Schünemann even considered offering distance courses, circulating the Academy's "ether-ready programs" via its own short-wave transmitter.[64] Although his plan never materialized, in 1929, in collaboration with the Tobis film studios, some courses were recorded as "music education teaching films" and presented in various settings.[65]

Schünemann and his colleagues regarded the project only partially as an educational institution, however. As we have seen, his integration of humanities expertise into this research at the radio lab placed him in the tradition of "humanities laboratories" as promoted by Carl Stumpf's Institute of Psychology. In contrast to that institution, the radio lab defined itself as a project of applied research in a pattern found mainly in engineering at the time. Despite the lab's cooperation with industry and political bodies, however, Schünemann insisted on its scientific freedom, hoping not so much for an immediate use of his colleagues' work, but a delayed and well-reflected application. Engineers at the lab evaluated and improved the broadcasting technology of the time, while speech educators felt free to sculpt speaker personalities instead of formulating sets of instructions for speaking for the radio.

The radio lab's political freedom was more limited. Although Kestenberg and Schünemann saw its research primarily as an aesthetic and social democratic endeavor to establish a new radio art for everyone, it is evident in retrospect that the radio lab also produced technologies and radio voices conducive to the broadcasting goals of the Nazi regime. When the Nazis came to power, Schünemann was critical of the new political environment, but remained outwardly conformist for the most part. That passivity helped to impose Nazi ideology and administrative structures within the Academy of Music, of which he had been appointed principal by the social democratic

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63. Schenk, *Hochschule für Musik zu Berlin*, 265.

64. "Drahtlose Hochschule für Musik und Rundfunkkunst," *Neue Berliner Zeitung*, June 8, 1932. Schünemann abandoned the project after fierce criticism from speech educators. Schünemann to *Neue Berliner Zeitung*, June 13, 1932, UdK-Archiv, 1/3.

65. Schünemann, "Die neue Funkversuchsstelle," 154; Schünemann, "Aufgaben der Funkversuchsstelle" (1929), 9–11.

Minister of Education in July 1932.[66] In April 1933, just a few months after the Nazi takeover, Schünemann was nevertheless demoted. He ran the musical instruments collection and the radio lab before moving to the music department of the Prussian State Library in 1935. That same year, the lab was closed down on the grounds that a radio-specific art was no longer viable and that technical experiments were better accommodated in industry and the broadcasting corporations.[67]

Some of Schünemann's colleagues pursued their careers far more successfully. Alfred Braun became a voice-over artist during the war, lending his voice to the 1941 propaganda piece *Himmelsstürmer*. Friedrich Trautwein, an avowed Nazi, was awarded a professorship at the Academy of Music and directed the Music and Technology group there. And in 1939, linguist Friedrichkarl Roedemeyer, known to Schünemann through their shared work at Doegen's sound department, opened Germany's first department of radio studies, at the University of Freiburg. Its main task during the war was to monitor enemy broadcasters, though Roedemeyer also followed the radio lab's example by setting up laboratories for acoustical experiments and elocution training, as well as systematically archiving the voices of Nazi radio.[68] Applied research is generally thought of as serving existing political agendas. But the radio lab, if only inadvertently, helped shape the voices of the disastrous political system that was soon to arise.

TRANSATLANTIC DEBATES

Moving beyond Germany, how did humanities scholars in other locations react to similar artistic and political dilemmas of radio speech? Three interrelated projects of radio research in the humanities are particularly noteworthy here. They take us from Vienna; to Cambridge, Massachusetts; and then to Princeton, New Jersey. All three are well known today but take on new significance in the context of the methods and political attitudes of the applied humanities; and all of them were concerned with the "voice of radio."

The Berlin radio lab focused on the production side of radio, but the 1930s also saw the beginning of reception studies, adding a new perspective to work on radio speech. A milestone was psychologist Herta Herzog's 1933 study "Stimme und Persönlichkeit" (Voice and personality), written at the University of Vienna, on perceptions of radio

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66. Schenk, *Hochschule für Musik zu Berlin*, 99–100.

67. Ibid., 271–72.

68. Arnulf Kutsch, *Rundfunkwissenschaft im Dritten Reich: Geschichte des Instituts für Rundfunkwissenschaft der Universität Freiburg* (Munich: Saur, 1985), 65–280; Carolyn Birdsall, "Radio Documents: Broadcasting, Sound Archiving, and the Rise of Radio Studies in Interwar Germany," *Technology and Culture* 60, no. 2 (2019): 96–128.

voices.[69] In her large-scale survey, Herzog asked listeners to gauge the appearance, profession, and personality of test speakers. She also investigated the listeners themselves and found that, while most listeners identified certain speaker types, they also developed individual associations when listening to the radio. In line with the language theory of her mentor Karl Bühler, Herzog defined the "physiognomy" and "expressiveness" of the speaker's radio voice as a performative phenomenon, constituted in its appeal to listeners and their listening experience.[70] Herzog was well aware that her research on vocal expression addressed urgent questions in broadcasting; nevertheless, she regarded her study as basic research, meant to be taken up by more specific and applicable research projects.[71]

Soon thereafter, Gordon Allport and Hadley Cantril published their work at the Harvard Psychological Laboratory in *The Psychology of Radio* (1935), again based on empirical surveys of how listeners evaluate personality through the radio voice. Not unlike Carl Stumpf and his studies in Gestalt psychology, Allport and Cantril's experiments in Cambridge found that most listeners were able to adapt to the "figure-ground situation which radio creates."[72] Even with reduced sound quality, "radio voices" were evaluated only 7 percent less accurately than the "normal voices" of speakers hidden behind a curtain—listeners proved to be "quite successful in 'hearing through' the inevitable burr which accompanies a mechanical transmission of the human voice."[73] Unlike Stumpf and Herzog, however, Allport and Cantril considered their results to be of immediate use for radio advertising, radio entertainment, radio education, and as-yet-unknown formats of future radio.[74]

The paths of Herzog and Cantril crossed at the Office of Radio Research (ORR) at Princeton University, founded in 1937 and directed by Herzog's then husband, the sociologist Paul Lazarsfeld. This celebrated project was funded first by the Rockefeller Foundation and starting in 1940 by Columbia University, with additional support from business and political donors. It pursued applied communication studies with a methodology that, literally, defined its successor institution, the Bureau of Applied

69. Herta Herzog, "Stimme und Persönlichkeit," *Zeitschrift für Psychologie* 190 (1933): 300–369. Herzog was inspired by Tom H. Pear, *Voice and Personality as Applied to Radio Broadcasting* (New York: Wiley, 1931).

70. Herzog, "Stimme und Persönlichkeit," 301 and 302. See also Cornelia Epping-Jäger, "Herta Herzog and the Viennese School of Radio Research," in *What Do We Really Know about Herta Herzog? Exploring the Life and Work of a Pioneer of Communication Research*, ed. Elisabeth Klaus and Josef Seethaler (Frankfurt am Main: PL Academic Research, 2016), 43–58.

71. Herzog, "Stimme und Persönlichkeit," 301 and 369.

72. Gordon W. Allport and Hadley Cantril, *The Psychology of Radio* (New York: Harper, 1935), 120.

73. Allport and Cantril, *The Psychology of Radio*, 119.

74. Allport and Cantril, *The Psychology of Radio*, 207–72.

Social Research, established in 1944. The ORR initially studied the reach, programming, and audience structure of commercial radio stations in the United States, later turning to the production of radio war guides for political information and the analysis of enemy broadcasters.[75] The ORR's statistical and comparative methods culminated in technologies such as the "program analyzer," much promoted by Lazarsfeld (fig. 6). Using the two buttons on this instrument, subjects could register their like or dislike of a particular broadcaster, program, or speaker's voice in real time throughout the test.[76]

In 1938, at Lazarsfeld's invitation, Theodor W. Adorno took over the ORR's radio music department, tasked with enriching it theoretically. Lazarsfeld's empiricism and Adorno's cultural critique were worlds apart, as is already obvious in correspondence preceding Adorno's emigration to the United States.[77] The epistemological context of that discrepancy has been much studied,[78] but Adorno's attitude is worth revisiting here, first, because Adorno doubted that philosophers and sociologists would ever find common ground in applied research; and second, because he spelled out those differences through the question of scholarly definitions of what he called "the radio voice."

In response to Lazarsfeld's methodology, Adorno formulated his own theory of radio, set out in several essays.[79] It was unacceptable, he argued, to consider the effects of radio—as Lazarsfeld did—from the standpoint of existing programming, which in the United States was mainly commercial. Critical radio studies must begin neither from the content of radio nor from its audience reception, but from its "physiognomy."[80]

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75. Paul Lazarsfeld, "Introduction," and Charles A. Siepman, "American Radio in Wartime: An Interim Survey of the OWI's Radio Bureau," both in *Radio Research 1942–1943*, ed. Paul Lazarsfeld and Frank Stanton (New York: Essential Books, 1944), v–viii and 111–50.

76. Jack N. Peterman, "The 'Program Analyzer': A New Technique in Studying Liked and Disliked Items in Radio Programs," *Journal of Applied Psychology* 24, no. 6 (1940): 728–41.

77. See especially Adorno to Lazarsfeld, January 24, 1938, in Theodor W. Adorno, *Briefe und Briefwechsel: Theodor W. Adorno, Max Horkheimer, Briefwechsel 1927–1969*, ed. Christoph Gödde and Henri Lonitz (Suhrkamp, 2003), 2:427–35.

78. Martin Jay, "Adorno in America," *New German Critique* 31 (Winter 1984): 157–82; David Jenemann, *Adorno in America* (Minneapolis: University of Minnesota Press, 2009); Christian Fleck, *Transatlantische Beziehungen: Zur Erfindung der empirischen Sozialforschung* (Frankfurt am Main: Suhrkamp, 2007), 264–352.

79. These have recently been published as Theodor W. Adorno, *Current of Music: Elements of a Radio Theory*, ed. Robert Hullot-Kentor (Cambridge: Polity, 2014). For most of these papers, Adorno drafted several versions. In the following, I refer to the versions archived at the Columbia University Rare Book and Manuscript Library. See also Thomas Y. Levin and Michael Von der Linn, "Elements of a Radio Theory: Adorno and the Princeton Radio Research Project," *Musical Quarterly* 78, no. 2 (1994): 316–24; Brian Kane, "Phenomenology, Physiognomy, and the 'Radio Voice,'" *New German Critique* 43, no. 129 (2016): 91–112.

80. Theodor W. Adorno, "Current of Music: Elements of a Radio Theory," Columbia University Rare Book and Manuscript Library, BASR, Box 1, B0016, 54.
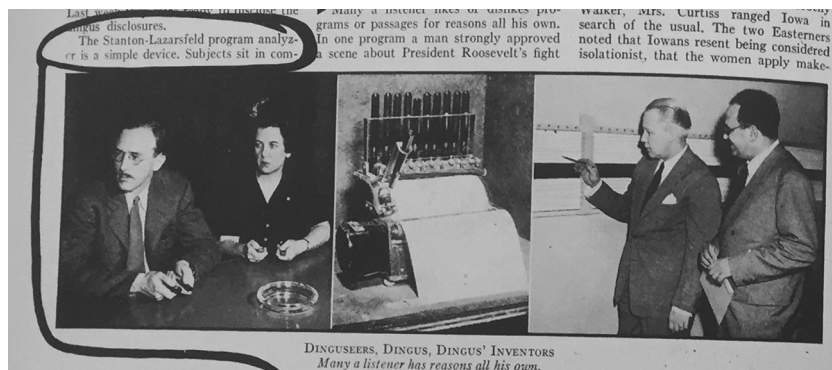
THEME

Figure 6. Brochure for the Lazarsfeld-Stanton Program Analyzer, 1942/43. Columbia University Rare Book and Manuscript Library, Box 7, B-0217. Color version available as an online enhancement.

That had nothing to do with the physiognomy of the radio voice as defined by Herzog; Adorno meant the nature of radio itself, as revealed first and foremost in radio technology with all its opportunities and limitations.[81] Accordingly, Adorno proposed a more abstract notion of the radio voice than the one deployed by his colleagues Allport and Cantril in their 1930s research at Harvard. Radio, Adorno writes, has an "expression or voice of its own, since it functions as a filter of the sounds it transmits."[82] The radio voice is found in the way that "radio 'speaks' through the microphone and into the receiving sets, regardless of subjective listening attitudes."[83] Whether in radio music or radio language, the "listener's tiny voice" cannot compete with the authoritarian "huge radio voice" or "super-voice."[84] The egalitarian, presentist, and participatory appearance of radio is thus deceptive: in reality, its unidirectional communicative structure suffers no contradiction, no individual way of listening, no analysis.

Though cautiously hopeful that a programming appropriate to the "technical conditions" of radio will emerge,[85] Adorno mentions none of the Berlin radio lab's experiments in radio technology and new broadcasting formats—a silence perhaps due in

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81. In several of his studies, Adorno referred to a paper on radio technology by composer Leopold Stokowski, "New Vistas in Radio," *Atlantic Monthly* 155 (1935): 1–16.

82. Theodor W. Adorno, "Social and Psychological Implications of 'The Radio Voice,'" Columbia University Rare Book and Manuscript Library, BASR, Box 1, B-0016, 10.

83. Theodor W. Adorno, "The Radio Voice: An Experiment in Theory," Columbia University Rare Book and Manuscript Library, BASR, Box 1, B-0076, 1.

84. Adorno, "Current of Music: Elements of a Radio Theory," 55.

85. Adorno, "A Social Critique of Radio Music," *Kenyon Review* 7, no. 2 (1945): 213. See also Adorno, "The Aesthetic Aspects of Radio," lecture, January 1939, Columbia University Rare Book and Manuscript Library, BASR, Box 1, B-0012, 23.

part to Schünemann's and especially Trautwein's political response to Nazi rule. More generally, the texts that Adorno drafted at the ORR all closed on a pessimistic, almost antagonistic note. Uncritical acceptance of radio's standards, he complained, had led to the rampant spread of "retrogressive listening" beyond radio itself.[86] Once audiences became accustomed to radio's "pre-digested" or "ready-made" material, they ceased to be capable of unfiltered listening. The same applied to the "behavior patterns" of the radio researcher, who could not simultaneously administer and criticize the medium.[87] A critical applied radio studies, therefore, must begin with an act of not-listening.[88]

Yet even Adorno failed to follow that maxim for long. Not only did he listen to the radio every day, but after returning to Frankfurt from American exile, he gave more than three hundred radio lectures, apparently without any qualms about accepting the fees.[89] To be sure, there was a difference between commercial broadcasting in the United States and public radio in postwar West Germany—enough of a difference, for Adorno, to now lend his own voice to this mass medium.

OPEN ENDS

The Berlin radio laboratory, run by Georg Schünemann between 1928 and 1935, was set up as an interdisciplinary project, where its members came together to seek (among other things) new broadcasting technologies and a new art of speaking on the radio— always stressing the provisional and experimental nature of their results. Experiments are open-ended, their results difficult to control. The Berlin radio lab's experiments both gave rise to German avant-garde radio art and handed the Nazis its expertise in speaking for the radio.

Schünemann's initiative may be interpreted as the first step in a long search for radio voices that has taken this article from the 1930s Berlin radio lab, to radio research in Freiburg, Vienna, Cambridge, and Princeton, then back to Germany. The object of that quest was more than a suitable voice for radio: at stake were the legitimacy of scientific and humanistic methods, as well as the social responsibility and potential ideological (mis)use of applied research.

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86. Adorno, "Social Critique of Radio Music," 213. On Adorno's earlier critique of "retrogressive listening" in interwar music, see Hansjakob Ziemer, "The Crisis of Listening in Interwar Germany," in *The Oxford Handbook of Music Listening in the 19th and 20th Centuries*, ed. Christian Thorau and Hansjakob Ziemer (New York: Oxford University Press, 2019), 97–122.

87. Adorno, "Social and Psychological Implications," 10. Adorno references Paul F. Lazarsfeld, "Remarks on Administrative and Critical Communications Research," *Studies in Philosophy and Social Science* 9, no. 1 (1941): 2–16.

88. Adorno, "Current of Music: Elements of a Radio Theory," 10–11.

89. Michael Schwarz, "'Er redet leicht, schreibt schwer': Theodor W. Adorno am Mikrophon," *Zeithistorische Forschungen* 8, no. 2 (2011): 286–94.

As we have seen, the emerging radio laboratories in Germany, Austria, and the United States all brought together acoustical engineers, artists, and scholars of multiple disciplines to fill the air with new forms of broadcast speech. Yet the study of radio was also divisive, provoking heated debates among social scientists and humanities scholars about whose methods were best suited to analyzing the voice and voices of radio. Whereas the group around Lazarsfeld offered their services to political institutions and industry, believing in the immediate applicability of their research, Adorno recommended pausing for a moment to think about how to describe the aesthetics and politics of broadcasting. Whether in search of a new sound of radio language, or a new language to describe it, these researchers were all aware that their findings could shape an important medium of their day, whose reach was far wider than that of most academic publications.

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THEME