

Telework in intellectual debates in the 1980s: Gendered visions of technology for the future society

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Introduction

A woman in front of a screen at a small, cluttered table, with her baby on her lap, in a kitchen or bedroom – this was the dominant image of a teleworker in the 1980s in German-language newspapers. The cover image shown in Figure 1, from an Austrian science and culture magazine from 1990, exemplifies this popular gendered imagination of decentralized office work. The title of the article asked: “Never back to the office?” and the text on “Teleheimarbeit” (tele-homeworking) referred to various US and European studies on telework which interpreted the phenomenon in either “skeptical” or “optimistic” ways, especially regarding the work situation of women in the anticipated “information society.”¹ The publication shows that the debate on telework was highly influenced by scientists. In this chapter, I examine the early intellectual history of the new work form and ask what influence the involved sciences had on the construction of the highly gendered and emotionally charged imagination of telework throughout the 1980s – and how the sciences themselves were influenced by their involvement with telework.

“Telework” describes the performance of office tasks outside the actual office by means of personal computers and new telecommunications technologies.² The term can be found especially during the 1980s and 1990s in transnational debates. There was not one single or clear definition of the work concept “telework”; still, the idea of decentralized office work became a widely debated key concept during the 1980s and had a high presence in academia and the public. However, the term “telework” was not as widespread in English as “Telearbeit” in German. Today, it is more common to talk about “remote work,” “home office,” or simply “working from home.”

1 Mauritz, “Teleheimarbeit.”

2 Historian Mirko Winkelmann notes in his both articles on telework how every author was concerned about a definition of the phenomenon: Winkelmann, “Vom Risiko zur Verheißung,” 128; Winkelmann, “Wende oder Wandel?,” 121.

Figure 1: This cover illustrates the gendered perception of telework as it prevailed in newspaper articles in German-speaking countries as well as in scientific publications on the subject.



Spektrum-Cover, April 15, 1990, in: AK-Wien: sowidok: Heimarbeit Österreich, 1988–1990.

Telework was first envisioned in 1976 by the engineer Jack Nilles in the US, after home and personal computers had been developed. It was a techno-euphoric vision of work in an anticipated new society, which was referred to as “information” or “knowledge” society.³ After the oil crises in the early 1970s, deindustrialization and computerization came to be widely discussed. This led globally to a perception of living in times of epochal change.⁴ In the socio-economic sphere, the phrase “after the boom” marks this disruption.⁵ The future of society, and in particular the future of work, was up for debate. In the 1980s, telework gained widespread international academic and public attention. Scientists were particularly interested in the phenomenon. They launched research projects and wrote about it. The importance of the sciences in discussing telework was primarily due to its technological

3 Danyel, “Zeitgeschichte der Informationsgesellschaft.”

4 From a global perspective on the history of emotions: Barua et al., “Introduction.”

5 See e.g. Bernet and Tanner, “Einleitung”; Raphael et al., *Vorgeschichte der Gegenwart*.

future-oriented notion. Various disciplines such as geography or spatial planning recognized telework as an opportunity to secure the economic and social survival of peripheral and mountainous regions. They wanted to use it for a “telematically induced re-ruralization” (*telematisch induzierte Wiederverländlichung*).⁶ Overall, the phenomenon consisted much more of discourse than actual working practice. In 1987, it was estimated that only about 10,000 people were actually teleworking worldwide.⁷

The discrepancy between the intensity of the debate and the actual realization was due to two reasons. First, the contemporary state of technology when computer networks were still connected via telephone wires made digital connections expensive and therefore mostly local. Moreover, home or personal computers had only just been invented, and the hardware was still expensive and therefore not affordable for every household.⁸ In Switzerland, for example, there were only about 200,000 personal computers in the corporate sector in the early 1980s.⁹ A lot of people had not yet had any real (working) experience with computers back then.¹⁰ Second, there were extreme emotions toward the idea of telework because it stood as an example of the impact of “computerization”: there was anxiety but also euphoria regarding the new technologies.¹¹

Scientists used telework in the 1980s internationally as a proxy for discussing social impacts of computer technologies for the future society, as I will argue in this chapter. My contribution focuses on the transnational intellectual debates on telework from its beginning in the mid-1970s in the US to its spread to the UK and German-speaking countries in the 1980s. By tracing the dialectic development of scientists’ interventions to the topic of telework, it becomes possible to narrate the history of a mostly imagined working practice that would not be realized on a larger scale until the 1990s and 2000s. As part of the debate on telework, the sciences involved (engineering and futurology, labor/union-oriented social sciences, large interdisciplinary research programs/STS) also negotiated their assessment of technology. The debates on telework shaped the public perception of the work form as well as they stimulated theoretical development and reorientation within the sciences, such as feminist theoretical approaches to science and technology studies (STS).

6 Stadler et al., *Gegen|Wissen*, IV/70.

7 Huber, *Telearbeit*, 59; Mirko Winkelmann describes different phases for the German context and defines the 1980’s as phase of “discourse without practice,” and the 1990’s as phase of “practice without discourse.” Winkelmann, “Vom Risiko zur Verheißung,” 151; Winkelmann, “Wende oder Wandel?,” 142.

8 See e.g. Gugerli, *Wie die Welt*; Albert, “Der vergessene ‘Brotkasten.’”

9 Buchberger et al., *Die Arbeit am Bildschirm*.

10 See for the simultaneity of the digital and the analogue: Christiane Berth’s chapter in this volume.

11 Winkelmann, “Vom Risiko zur Verheißung”; Bösch, “Euphorie und Ängste.”

I examine the most influential publications on telework from the time through a close reading and analyze them with regard to the different cultural contexts, political visions, and scientific developments aligned with telework. After exploring the context of thought of the first imaginations of telework situated in US futurology, I turn to feminist social scientist reactions in Europe. How did futurists and feminists study and politicize telework? I will show that US futurists and European feminists engaged controversially in the debate, and that they operated with gendered and emotional perceptions of technology in order to either promote or criticize telework. As a consequence, they created a shared imagination of the work form in these societies, based on gendered and emotional presumptions. Furthermore, it becomes evident that the interventions of the scientists themselves on telework were situated in their cultural, political, historical, and gender-specific background – what STS thinker Donna Haraway calls “situated knowledges” in her feminist critique at the dominant understanding of objectivity.¹²

As the magazine cover shows, telework was discussed as a gendered phenomenon at the time.¹³ In the office, computers especially changed the work situation of women workers. Because office work was highly gendered from the late nineteenth century, some office tasks had become women's jobs.¹⁴ Professions such as secretaries,¹⁵ computer operators,¹⁶ telephonists,¹⁷ and typists¹⁸ were mainly women's work in Europe and North America. And these feminized jobs were especially affected by the implementation of new technologies. Female office workers suffered from a lot of distress when the new technologies were introduced at the workplace: they feared losing their jobs or being unable to adapt to the necessary computing skills, as the British social scientist Ursula Huws discovered in 1982 among female office workers in Leeds.¹⁹ Thus, computerization caused gender relations and hierarchies, as well as the gendered organization of office work, to be up for negotiation.²⁰

12 Haraway, “Situated Knowledges.”

13 The current historical research on telework focuses on questions of gender: Winkelmann, “Vom Risiko zur Verheißung”; Winkelmann, “Wende oder Wandel?”; Homberg et al., “From ‘Home Work’”; Homberg and Winkelmann, “Home Is Where”; Kocka, “Telework.”

14 Gardey, “Gender-Technology Relations”, 157–69; Gardey, *Schreiben, Rechnen, Ablegen*; see also earlier labour historian contributions on the topic: Nienhaus, *Berufsstand weiblich*; Davies, *Woman's Place Is at the Typewriter*; Anderson, *The White-Blouse Revolution*.

15 Berebitsky, *Sex and the Office*.

16 Jennifer Light shows in her study that the term “computers” was first used for the women workers before it was transferred to the devices. Light, “When Computers Were Women.”

17 Schüller, “Vom Wohnzimmer in die Telefonzentrale.”

18 See Helen Glew's chapter on the typing pool in this volume.

19 Huws, *Your Job in the 80's*.

20 See e.g. Hicks, *Programmed Inequality*.

The gendered debate about computers in the office of the future was accompanied by the highly emotional and ambiguous debate on computerization in general, related to the spread of (personal) computers in various areas of daily life. Topics such as surveillance and rationalization caused a lot of trouble, while at the same time some experts promised that computers would “humanize” labor and lead to more leisure. This caused many ambiguous feelings such as fear, frustration, and anxiety, but also hope and euphoria, both at an individual and a social level.²¹

To grasp this emotional dimension, the methodological concept of *Technikemotionen* (technological emotions), established by historian of technology Martina Heßler, is useful. *Technikemotionen* means the co-construction of technology and emotions.²² By examining the interaction and interrelationship of technology and emotions, technological-historical narratives become visible, including how they are developed and shaped by different aspects, such as national stereotypes and gender dynamics.²³ Especially the envisioned gendered teleworking situation caused a lot of anger, concern, and fear, as unionist demands for a ban show.²⁴ The examination of the different (emotional) positions on gender and telework not only reveals the influence of *Technikemotionen* in the interpretation of the phenomenon and the instrumentalization of *Technikemotionen* for the politization of telework.

The focus on *Technikemotionen* furthermore reveals different scientific communities that were concerned with the future society and emotional anticipation of it. In this way, the futurists and social scientists also formed different *emotional communities*. In Barbara Rosenwein's definition of emotional communities, these are related to social groups with a shared textual basis.²⁵ By following the intellectual network of telework internationally, I show how techno-deterministic narratives were addressed and how they interacted with emotions and gender. Anxiety or euphoria toward computerization interrelated with the position of the scientists and was a gendered phenomenon. This reveals a dialectic development of different scientific networks around telework as gendered emotional communities with utopian or dystopian expectations regarding the future during the beginning of the “digital revolution” in the 1980s.²⁶

21 Bösch, “Euphorie und Ängste.”

22 Heßler, “Technikemotionen,” 14–20.

23 Heßler, 25n.

24 That was the case in West Germany where trade unions demanded for a ban on telework in 1983. Swiss trade unions originally wanted to follow this demand. “Stopp der elektronischen Heimarbeit!,” *SMUV-Zeitung*, February 29, 1984, 83; see also Winkelmann, “Wende oder Wandel?,” 129.

25 Rosenwein, *Emotional Communities*.

26 Ricky Wichum and Daniela Zetti identify the perception of (continuous) change as written into the ideology of the so-called digital revolution. Wichum and Zetti, “Transformation,” 1–11; see also: Balbi, *The Digital Revolution*.

The chapter thus contributes to the history of science, gender, and emotions in the beginning of the so-called digital age. Writing a social and gender history of digitization is an ongoing desideratum in contemporary history but currently there is a lot of new research addressing this gap.²⁷ One important research area points out the masculinization of computer work.²⁸ In their study, historian Mar Hicks concludes that Britain's decline in computing was due to the exclusion and invisibility of women as computer workers since the 1960s, and emphasizes that: "All History of Computing is Gendered History."²⁹ The strongly gendered debate to the home office since the rapid reorganization of work during the Covid-19 pandemic emphasized the need to historicize the gendered debate on decentralized office work.³⁰

To study the gendered visions of telework, I present the primary tech-optimistic conception of telework by US futurists since the mid-1970s in the first section. Then I turn to feminist reactions on this anticipated change of work in Europe. Feminist social scientists interpreted telework primarily as a matter of women's work because of feminized office jobs and space-related gender-specific division of labor, as I will show in the second section. The third section deals specifically with female unionists in the Federal Republic of Germany (FRG), who represented a kind of tech-deterministic pessimism and argued with so-called female "tech-fear."³¹ Then, I examine reactions toward this gendered problematization of work. On the one hand, European scientists of various disciplines tried to refocus the debate onto telework, away from the gendered notion. They promoted telework and tried to set it into practice. They returned to tech-optimistic visions of the early futurists and thus implicitly to the male connotations of telework because they associated the work with highly qualified male professionals. On the other hand, there was the analysis of feminist English-speaking social scientists who critically engaged in science and technology studies (STS). By reflecting the connections of gender, technology, and emotions in patriarchal capitalism, they focused on telework. The feminist social scientists identified the male connotation of technology as the main problem because it led to a de-skilling of women's tasks or the expulsion of women workers. This was also the case with telework. But they argued in favor to overcome every deterministic notion of technology and gender. In this sense, as I will argue, the transnational debate on telework helped lay the foundation for theories about the co-construction of tech-

27 Bösch, "Wege in die digitale Gesellschaft"; Heßler and Weber, "Provokationen der Technikgeschichte."

28 Light, "When Computers Were Women"; Ensmenger, *The Computer Boys*; Hicks, *Programmed Inequality*; Schafer, "What the History."

29 Hicks, *Programmed Inequality*, 234.

30 Kocka, "Telework."

31 For the history of "tech-fear" in general: Heßler and Hitzer. "Introduction: Tech-Fear."

nology and gender, which were fundamental for technology-related equality policies in the 1990s.

US futurists and the male notion of technology: The decentralized office as technological fix around 1980

Since the oil crisis had a dramatic impact on the world economy in the early 1970s, traffic and energy costs emerged as critical topics. In areas like Los Angeles, urban development and air pollution were perceived as dangerous. In this context, the US engineer Jack Nilles recognized telecommunications as a tool to decentralize office work. Nilles and an interdisciplinary team started nationally funded research on the topic at the University of Southern California.³² The aim of their project was to study “potential telecommunications alternatives to transport.”³³

In the study, published in 1976, they advocated for the use of telecommunications to substitute transportation as a “trade-off”: they called this “option” *telecommuting*. In their view, telecommuting should serve as a technological fix to traffic and environmental problems. Nilles and his team calculated the potential costs saved by telecommuting. They called for companies to use this option by highlighting economic advantages and that policy making should encourage it to solve the aforementioned ecological and financial problems. Nilles and colleagues wrote:

Given the capability of modern telecommunications and computer technologies to efficiently produce, transmit, and store information, it appears probable that many information industry workers could “telecommute.” That is, they could perform their work, using communications and computer technologies, at locations much closer to their homes than is the case now.³⁴

Telecommuting was proposed for the so-called “information industry workers.” The “information society” represented the perception of a new age which had been discussed since the 1970s because of the upheavals of deindustrialization and computerization.³⁵ The oil crisis pushed the economic shift from blue- to white-collar work in Western countries. There was talk of “information industry workers” as a large new part of the workforce. In Switzerland, for example, the proportion of employees in the industrial sector fell from 48% to 35% between the 1970s and 1990s, while the proportion of employees in the service sector rose from 44% to 62% in the same time

32 Nilles et al., *The Telecommunications–Transportation Tradeoff*; Capraro, *Work Different*.

33 Nilles et al., *The Telecommunications–Transportation Tradeoff*, v.

34 Nilles et al., 4.

35 Danyel, “Zeitgeschichte der Informationsgesellschaft.”

period.³⁶ This process was reflected as the coming of the “knowledge society.”³⁷ In this logic, computerization was perceived optimistically as a chance for society. Interestingly, Nilles imagined the telecommuters would work “closer to their homes,” not *at* home. Instead, they should work in decentralized offices, which companies should set up as a kind of branch closer to residential areas. The separation of the public and the private sphere was not challenged by this vision for future work organization.³⁸

Nilles and his colleagues envisioned telecommuting in the mid-1970s as a way to decentralize white-collar workplaces through telecommunications. As such, they were mainly concerned with traffic, technology costs, and environmental issues. Telecommuting appeared as a form of work organization which promised a better future through technology. The original idea of telework thus represented a tech-optimistic view, in which the scientists wanted to inform the readers “about using and developing technology for the wisest service to mankind,”³⁹ as they wrote in the preface.

The US author Alvin Toffler argued in a similar technology-driven direction as Nilles and his team. Toffler was a prominent futurist; his book *Futureshock*, published in 1974, had been a worldwide bestseller. In *Futureshock* he developed his key point, that society is facing a fundamental transformation on all levels: “We are creating a new society. Not a changed society. Not an extended, larger-than-life version of our present society. But a new society.”⁴⁰ He imagined technology as the “engine” and knowledge as “its fuel.”⁴¹ In this metaphor, the industrial progress is written in. Toffler transferred industrial economics to the information industry – and transgressed it: “Human work will move out of the factory and mass office into the community and the home.”⁴² Toffler’s idea of technology corresponds with the potential that media historian Elizabeth Patton associates with it because communication technologies would “disrupt[e] ideological spatial divisions between the sites of leisure (formerly code as unproductive by disregarding unpaid labor) and sites of market labor.”⁴³

36 Tanner, *Geschichte der Schweiz*, 484n.

37 Bell, *Coming of Post-Industrial Society*; Stuhr, *Mythos New Economy*.

38 This is remarkable because media historian Elizabeth Patton shows in her study on the “home office” how communication technologies (e.g. the telephone) undermined the separation of the private and public from the very beginning. Patton, *Easy Living*, 3.

39 Nilles et al., *The Telecommunications–Transportation Tradeoff*, vi.

40 Toffler, *Future Shock*, 185.

41 Toffler, 30.

42 Toffler, 402.

43 Patton, *Easy Living*, 3.

Toffler argued that the acceleration of technological change was causing anxiety, so, it was key to anticipate the future to calm people.⁴⁴ For this reason, Toffler argues for “futurology” as a scientific approach to the future, which he saw as an urgent task in times of change.⁴⁵ It was also an intervention for establishing futurology as a research field. Computer-based decentralization of office work was an important case (study) for the futurists.

In 1980, Toffler then discussed the concept of telecommuting in his popular book *The Third Wave*, which would predict a new period of socio-economic organization based on the “Information Revolution.” Whereas in his first book Toffler had written broadly about a reorganization of work, he now looked more concretely at how home computers could change jobs.⁴⁶ Therefore, he referred in detail to Nilles’ calculations, although his main conclusion was different. For Toffler, telecommuting was primarily a means of working from home, leading to “The Electronic Cottage,” a central point in his argumentation for the sake of the new society. “The Electronic Cottage” was *the* tool to rebuild a home-centered society and therefore to reintegrate work and family life.⁴⁷ “The Electronic Cottage” should “humanize” working conditions, minimize the divorce rate and strengthen the local community, especially the family.⁴⁸ In Toffler’s book, computer technologies and decentralized work organization offered the promise of a better future. The argument was essentially technoeuphoric.

This better, computer-based future, however, appealed to notions from the past. “The Electronic Cottage” represented the pre-modern idea of organizing society through the “whole house” as a producer and consumer entity.⁴⁹ Toffler imagined men and women both working at home, which would change the gender-specific division of labor; they could even share employment. In this sense, Toffler envisioned a new gender order that would differ from the existing one. The existing binary gender order was established in the nineteenth century with a dichotomous organization of tasks, the male breadwinner ideology and a strict heteronormative hierarchy, as historians such as Karin Hausen showed in their pioneering research in the 1970s.⁵⁰ In Toffler’s *Electronic Cottage*, the premodern organization in households is the tool to overcome the modern (and bourgeois) conception of gender-specific work organization, with the woman in the private sphere and the man in the public. Because the heterosexual married couple would perform their work

44 Toffler, *Future Shock*, 1–20.

45 On the history of the future studies in the German context, see Seefried, *Zukünfte*.

46 Toffler, *The Third Wave*, 195–209.

47 Toffler, 210n.

48 Toffler, 219–23.

49 Schmidt-Voges et al., “Das Haus in der Vormoderne.”

50 Hausen, “Die Polarisierung der Geschlechtscharaktere.”

together in the private space, there would be room for shared (working) experiences and different forms of work organization in the family. Toffler promised that “The Electronic Cottage” could, “to put it simply, provide a common set of experiences and get marriage partners talking to one another again. It could shift their relationships along the spectrum from ‘cool’ to ‘hot’. It could also redefine love itself and bring with it the concept of Love Plus.”⁵¹ Based on a culturally pessimistic diagnosis, Toffler therefore focused on the heteronormative family and its adaption in the new age: the shared (working) experiences should lead to a new understanding between the partners. The aspect of gender was only mentioned in order to guarantee the heterosexual family model and the organization of paid work in it.⁵²

Overall, Toffler put Nilles’ concept into a new context. In Nilles’ telecommuting, the community-oriented aspect was only a side note.⁵³ For Toffler, bringing work back into the home through computers and telecommunications, rather than commuting to distant offices, was a promising chance for *The Third Wave*. “The Electronic Cottage” would create a “more human civilization” (to which the German subtitle of the book attested).

By the early 1980s, Nilles’ and Toffler’s visions together had shaped the primary notion of telework and thus influenced future discussions of it. As a first consequence, a two-fold pattern evolved: on the one side, the argument focused on environment and traffic; on the other, on family and work–life–balance.⁵⁴ Secondly, telework provided a vision for the future – not only with regard to the organization of work, but rather for society as a whole. And thirdly, technologies, especially telecommunications, were seen as enablers of social change – as a technological fix.⁵⁵ These early intellectual considerations on decentralized office work established a tech-optimistic as well as tech-deterministic notion of telework.

The conception of telework was gender biased, however. A gender dimension was indicated only indirectly such as through comments on family life – as we have seen in Toffler.⁵⁶ Also the gender blindness of Nilles’ argumentation reproduced the male norm of employment. In their techno-utopias, women were not working with computers – in contrast to the office reality where computer work was mainly women’s work due to the gender division in office tasks. As a consequence, the scientists Nilles and Toffler also represented a male culture/gesture with their optimistic and at the same time deterministic attitude toward technology. The

51 Toffler, *The Third Wave*, 234.

52 Toffler, 232–34.

53 Nilles et al., *The Telecommunications–Transportation Tradeoff*, 159.

54 The same ambiguity recognizes also Winkelmann, “Wende oder Wandel?,” 125.

55 “Because the technologies are often in the role of the hidden or unperceived enablers of social decisions”: Nilles et al., *The Telecommunications–Transportation Tradeoff*, 171; also Winkelmann, “Wende oder Wandel?,” 125.

56 Toffler, *The Third Wave*, 220–23; Toffler, *Future Shock*, 37.

general assumption that men represented technological progress and had to be technophiles came into play here.⁵⁷ The early concept of telework was therefore the result of male visions regarding personal computers and the future society. By influencing not only the notion but also the visionary character and – implicitly – the male orientation of telework, Nilles and Toffler became seen as pioneers and were repeatedly mentioned in subsequent research.⁵⁸

This genderblind but at the same time implicitly gendered coining of decentralized office work situates telework in the numerous theories of social transformation established since the 1960s. This was the context of thought in which the concepts of telecommuting and “The Electronic Cottage” were developed. Nilles’ and Toffler’s visions for computer-based decentralization of office work illustrate how science engaged in predicting a future “new society.”⁵⁹ James Beniger listed more than forty such predictions in his own study of *The Control Revolution*.⁶⁰ Some famous examples were, apart from the already discussed information society: Peter F. Drucker’s knowledge society (1968), Daniel Bell’s post-industrial society (1973), Ulrich Beck’s risk society (1986), and later also Manuel Castells’ network society (1996).⁶¹

These sociological theories were highly influential for social self-description while always announcing a new phase for society which was to come.⁶² All these predicted “new societies” were based on interpretations of economic and technological change. They all stated a shift from the industrial to the service sector with various implications, such as the growing importance of knowledge, science, and information, the restructuring of labor in general, but also other (mainly meritocratic) forms of political organization. Another commonality was the importance attributed to the technologies and the (positive) impact they were expected to have, especially computers and telecommunications. Ideologically, these theories brought together visions of future and technology to promote a tech-utopia which was leading, in Toffler’s words, to a “more human society.”

Nilles and Toffler stand in this tradition of finding solutions for the problems of the present by predicting “a new society.” They noted the same developments as the

57 Hefßler, “Technikemotionen,” 25nf.

58 See e.g. Huber, *Telearbeit*; Jaeger et al., *Telearbeit*; Qvortrup, “Telework”; also in recent historical research: Homberg and Winkelmann, “Home Is Where the Office Is.”

59 For the history of the futures: Hölscher, *Die Entdeckung der Zukunft*; Esposito, “Zeitenwandel.”

60 Beniger, *The Control Revolution*, 4n.

61 Drucker, *Age of Discontinuity*; Bell, *Coming of Post-Industrial Society*; Beck, *Risikogesellschaft*; Castells, *Network Society*; see also Steinbicker, *Zur Theorie der Informationsgesellschaft*.

62 Alban Frei and Hannes Mangold characterize this as a postmodern modus of description with the logic “of a medusa,” because “each time the new society got a new name, two even newer names were to follow.” Translated by the author. Original: “wann immer die neue Gesellschaft mit einem neuen Namen benannt wurde, [wuchsen ihr] zwei noch neuere Namen nach”; see Frei and Mangold, “Einleitung,” 11.

literature on social transformation, such as deindustrialization and computerization. These sociological theories were a common ground of academic thinking. Toffler, for example, based his argument explicitly on Bell's "post-industrial society."⁶³ In this way, Nilles and Toffler depicted telework as a tool to reorganize work (and through work all other aspects of social life) in the future "new society."

Turning to the question of gender, we see that beyond the general observation of increasing female employment because of the growing service sector,⁶⁴ no attention was paid to the gendering of the predicted developments. Specific consequences of these transformations for women or the gender order were not explicitly discussed, as was common at the time. Another implicit notion on gender at this early stage of telework is the male authorship of these visions: All the futurists and theorists of societal transformation were men. They formed a (male) scientific community which was bound together not only by the perception of a problematic present but also by the anticipation of a better future through the positive effects of technology. Due to their gender role and socialization, this male community also shared emotions toward technological and social change.⁶⁵ As an emotional community, they were engaged in promoting their visions of technology and culture, especially in the US. This is where telework as a technological fix for problems regarding office work in service of the new society have been developed.

However, these ways of thinking about future new societies were also contested by contemporaries. The entire genre of future studies has been criticized, particularly Toffler's work. Beniger, for example, attested that Toffler could not grasp the *longue durée* of the societal transformation, and the Austrian sociologist Holger Rust described the entire literature twenty years later as only a superficially visionary form of naïve techno-optimism, and, even worse, as an unscientific business model for selling books.⁶⁶ So it was exactly the deterministic (and positively connoted) link between future and technology which was criticized. And it was precisely the gender-specific dimension of this link between technology, technophile visions for society, and the male gesture which was problematized by English and German feminists with regard to telework in the following years.

63 Toffler, *The Third Wave*, 25.

64 Bell, *The Coming of Post-Industrial Society*, 146.

65 Sociologist Martin Meuser recognized regarding the construction of masculinity in the "network society" (Castells) some irritation at the hegemonial breadwinner model. Nevertheless, men controlled the networking in the different social spheres through male communities. Meuser, "Nichts als alter Wein," 89.

66 Beniger, *The Control Revolution*, 1n; Rust, *Trends*, 7–14.

Telework as a matter of women's work by the mid-1980s: The interpretation of European feminist social scientists

As discussed, the early conceptualization of telework in the late 1970s conveyed specific notions: on the one hand, the two-sided notion of telework ranging from telecommuting to "The Electronic Cottage"; on the other hand, the gender bias regarding the phenomenon. In this section, I will discuss the international diffusion of the concept in the early 1980s, especially in the UK and in West Germany. By then, the notion of telework as women's work had become very popular, especially in the German-language media.⁶⁷ I show that feminist social scientists and union women emerged as a different scientific *and* emotional community that played a crucial role in defining telework as women's work.

The New Women's Movement had given new impetus to the politicization of women's work in the 1970s.⁶⁸ Through this social movement, women's union groups were founded, or the existing ones gained more importance. Female unionists criticized the trade unions as patriarchal institutions: they politicized the matter of women's work in trade unions from within. The feminists within and outside the trade unions saw economic independence as a precondition for emancipation. But there was also critique of the ongoing female responsibility for housework and care work. The feminists coined the term "double load" to describe this.⁶⁹ They emphasized the correlation of class and gender in wage labor: women often worked in low-paid and precarious jobs.⁷⁰

From the mid-twentieth century, a lot of wage-earning women were working in offices and they made up the major part of the office workers. In the UK, for example, women accounted for 78% of all white-collar workers in 1980.⁷¹ From the late 1970s, research was carried out on women's office work.⁷² One example of this new research focus is the study from the British labor sociologist Ursula Huws. Huws investigated on behalf of a Leeds trade union the effects of "microelectronics" on women's jobs in West Yorkshire. As a result, she published a unionist guide for women workers on how to respond to the new technologies.⁷³ She argued that women were not trained

67 This fact becomes remarkably evident by searching the media documentaries on "telework" (or also on "homework") in various archives, e.g., Arbeiterkammer (AK) Wien sowidok 331.794 Heimarbeit; Archiv für Zeitgeschichte, AfZ: IB wf [Gesellschaft zur Förderung der schweizerischen Wirtschaft]-Archiv II 27.9: 10524–26 EDV und Heimarbeit (Telearbeit); Schweizerisches Sozialarchiv SAR QS/ZA 70.3 Heimarbeit, Telearbeit.

68 See e.g. Schulz, "Neue Frauenbewegung in Europa"; Ferree, *Varieties of Feminism*.

69 Isler, "Lohn für Hausarbeit."

70 Balka and Wagner, "A Historical View."

71 Hicks, *Programmed Inequality*, 230.

72 McNally, *Women for Hire*; see also Balka and Wagner, "A Historical View."

73 Huws, *Your Job in the 80's*.

in the handling of new technologies in order to keep them low in the office hierarchy, with correspondingly low wages. In consequence, she demanded education, especially for older women, so they did not fall behind.

By examining the research by female social scientists on “microelectronics” (computer technologies) in the office, it becomes clear that the awareness of women-specific effects of telework rose. Telework thus emerged in the early 1980s as a complex of women’s employment, (personal) computers, and the longstanding tradition of homeworking. Huws, for example, made the general observation that:

One new group of homeworkers, which has expanded considerably in recent years, is computer programmers. Often, these are mothers who had full-time staff programming jobs before their children were born. Government cutbacks in spending on nursery provision and other social services mean that more and more women are finding it impossible to go out to work. This, combined with increasingly sophisticated communications technology which links homes with offices, seems bound to lead to more growth in the “hidden army,” as captive homeworkers have been described.⁷⁴

Huws identified a “new group of homeworkers.”⁷⁵ They were female programmers who were forced into precarious working conditions because of their mother role and due to the gendering of computer work. The perception of telework as women’s work arose not only from gendered effects of the computer technology in offices but also from the narrow notion of telework as working “tele” from home, thus rooted in Toffler’s idea of “The Electronic Cottage.” Feminist union women and social scientists like Huws problematized this new concept of “telework” by pointing out similarities with historical homeworking and its gendered dimension.⁷⁶ In German, the term *Teleheimarbeit* (tele-homeworking) emphasizes the connection to the cottage industry even more explicitly.

Because of the perception of the cottage industry as a precarious, premodern, and highly feminized form of work, so-called computer-based or electronic homeworking was met with great skepticism, especially by unionists. Homeworkers were seen as isolated and difficult to organize.⁷⁷ With no regulations and low income, the cottage industry appeared to be the antithesis of wage labor in factories and

74 Huws, 35.

75 In the years that followed, Huws became a renowned expert on teleworking: Her 1984 study was titled *The New Homeworkers*, and in the 1990s she was a member of advisory commissions on the regulation of telework in Europe. Huws, *The New Homeworkers*; Huws et al., *Telework*; Huws et al., *Vertiefende Untersuchung zum Weissbuch*; Huws et al., *Teleworking and Gender*.

76 Winkelmann, “Vom Risiko zur Verheißung”; Winkelmann, “Wende oder Wandel?,” 126–29.

77 Boris, “From Industrial Evil.”

offices.⁷⁸ Homeworking was seen as a temporary and unskilled form of labor. All these features were also attributed to female labor. This gendered dimension was intensified by the spatial organization of the work. Because homeworking took place in the household, it was even more firmly classified as women's work. In a Swiss TV show, for example, "Teleheimarbeit" was called a "relapse into the pre-industrial age."⁷⁹ Thus, the consideration of time contradicted the one of the US futurists: while the latter regarded telework as a vision of the future, European feminists saw it as a reenactment of the past. They shared Toffler's vision about the restoring effects of "The Electronic Cottage," but they attributed nothing positive to it. The tech-utopia of the futurists became a reactionary dystopia for the (union) women and feminist social scientists. Accordingly, feminist social scientists were skeptical about new technologies. From their perspective, they thought of them as a threat: they could worsen the social and work position of women.⁸⁰

This skeptical interpretation of telework had two backgrounds. First, it was situated in the research of feminist social scientists. They investigated female office workers, often on behalf of unions. In this context, the new technologies were seen as a gender-specific "threat" because they were expected to worsen the working conditions and job security of workers in general and of women office workers in particular.⁸¹ As a result, feminist social scientists emerged as an emotional community concerned about the computerization of office work because of women workers.

The other background for this emotional interpretation of the technological transformation lay in the position of trade unions toward technological change. Unions in the US and (Western) Europe were generally afraid of so-called "automation" or "rationalization." They feared job losses, de-qualification, and monotony as consequences of the microelectronics in factories and offices.⁸² As in the 1920s, the developments were debated as "proletarianization" of white-collar workers.⁸³ The "office of the future" was called "electronic sweatshop," transformed by computers "into the factory of the past."⁸⁴

This diagnosis was also crucial for the assessment of telework by union women. Because of the underprivileged status of female labor, they expected secretaries or typists to be the first to lose their jobs during rationalization.⁸⁵ So they interpreted the new technologies in the same way as the feminist social scientists: namely as a threat for women's office jobs. The already precarious and marginalized position

78 Tanner, "Heimarbeit."

79 Original: "Rückfall ins vorindustrielle Zeitalter," see MTW, "Homeoffice."

80 Bahl-Benker, "Statt Hektik im Büro."

81 Werneke, *Microelectronics and Office Jobs*; Vogelheim, *Frauen am Computer*.

82 Müller, "Von Job-Killern."

83 Kracauer, *Die Angestellten*.

84 Garson, *The Electronic Sweatshop*; see also Christiane Berth's chapter in this volume.

85 Werneke, *Microelectronics and Office Jobs*.

of women in the labor market could be worsened by automatization.⁸⁶ Because of their similar interpretation of computerization and its effects on women office workers, union women and social scientists incorporated a similar interpretation of telework. They were part of the same emotional community.

German union women as emotional community and the fear of telework

In West Germany, the trade union position against “rationalization” was particularly pronounced. The historian Frank Biess places it in context of stereotypical German *Angst* (fear). Biess argues that by examining various German “Angstobjekte” (objects of fear), a different history of the FRG would become visible, illuminating the interactions between new technologies, economic changes, and transformations in the history of emotions.⁸⁷ The role of emotions in democracies, and in particular the future-orientation of fear, would be condensed in German *Angst*. According to Biess, the term refers to a common (self-)description and an established discourse around Germany but it can also be found directly in contemporary sources.⁸⁸ German tech fear operated with a specific politics of remembrance of mass unemployment in the Weimar Republic with its anti-democratic outcomes.⁸⁹ One of these German “Angstobjekte” was “automation,” with the debate about it starting in the late 1950s. Biess analyzes this debate surrounding German tech-fear as “modern fear,” which was characterized by techno-deterministic perceptions and US orientation and thus represented an effect of the Cold War.⁹⁰

The trade unions played an important role in the automation debate.⁹¹ Historian Moritz Müller shows that in the 1980s fears of the effects of “microelectronics” affected different emotional communities in IG Metall – one of the most important and influential German trade unions. While the functionaries politicized fears against computerization, union members’ feelings toward the new technologies varied between powerlessness and pride.⁹² In the context of this union-established tech-fear, historian Andie Rothenhäuser argues that the narrative of a specifically German “hostility toward technology” (*Technikfeindlichkeit*) was a politically motivated reaction by the employer lobby to delegitimize the union’s criticism of “microelectronics,” civilian protest against surveillance, and the environmental movement against nuclear power plants. The employers and their lobby claimed

86 See Helen Glew’s chapter on the typing pool in this volume.

87 Biess, *Republik der Angst*, 36–40.

88 Biess, 18–24.

89 Biess, 159n.

90 Biess, 161–74.

91 Biess, 185–90.

92 Müller, “Von Job-Killern.”

that trade unions were harming economic progress through their negative attitude toward technology.⁹³ In the FRG, the term “tech-fear” combined the stereotypical German *Angst* with (transnational) trade union worries about working conditions and job security in times of computerization. These remarks make clear that in the German context, the interpretation of technological change was particularly controversial at the time.

In the context of the German (tech-)fear, the early presence of German union women in the debate on telework is not surprising.⁹⁴ They problematized the decentralization of office work through computers and telecommunications by highlighting possible effects of “rationalization.” Unionist, German, and gender-specific fear of computerization came together in their resentment of telework. Together these dimensions nourished a discourse around something that was called “female tech-fear” (*spezifisch weibliche Technikskepsis*).⁹⁵ This had a particular impact on discussions about telework in the German context.

The brochure of the German sociologist and unionist Marliese Dobberthien exemplifies the gendered fears about telework (Figure 2). It was published in 1985 in the name of the German Trade Union Confederation.⁹⁶ The cartoon on the cover connects telework and women's work: the husband is presented as the male breadwinner working away from home, while teleworking from home was imagined as a way for wives and mothers to earn some extra money. The cartoon illustrates the double load carried by different types of feminized labor: the woman is occupied with housework, childcare, and typing. On the husband's question about her day,⁹⁷ she responded that it was completely “normal”: “No, just a normal day, pea soup, swollen tonsils, five hours in the office, just a bit tired!”⁹⁸ Regarding the demonstrated gendering of the private and public spheres, it is astonishing that the woman talks about her work as situated in an office: “five hours in the office.”⁹⁹ Although, she performs decentralized office work at home, she (still) imagines herself being part of the social

93 Rothenhäusler, “Wegweiser Richtung Steinzeit.”

94 Bahl-Benker, “Statt Hektik im Büro”; Dobberthien, *Teleheimarbeit*; another example is the demand for a ban in 1983, see Winkelmann, “Wende oder Wandel?,” 129.

95 This is exactly what later the feminist STS addresses. E.g. Cynthia Cockburn points out that there is nothing “natural” in this attitude of women toward technology. Cockburn, *Die Herrschaftsmaschine*, 18–23.

96 Dobberthien, *Teleheimarbeit*.

97 Original: “N'Abend Schatz, ist das Essen fertig, hat Fritzchen noch Husten, gibt's was Besonderes?” (Evening darling, is dinner ready, is Fritzchen still coughing, is there anything special?), translation by the author.

98 Original: “Nein, ganz normaler Tag, Erbsensuppe, geschwollene Mandeln, fünf Stunden im Büro, nur ein wenig abgespannt!,” translation by the author.

99 Hausen, “Polarisierung der Geschlechtscharaktere.”

space “office” and marks it in this way as paid work. Apparently, the decentralization of office work was also an ambivalent process in terms of space.

Figure 2: The union brochure shows ambiguity toward the new technologies: it asks if “Teleheimarbeit” would be a threat or an opportunity.



Dobberthien, Marliese: Teleheimarbeit. Elektronische Heimarbeit – Gefahr oder Chance? Hg. von DGB/Landesbezirk Baden-Württemberg. Stuttgart 1985.

Rather surprising for a publication on “Teleheimarbeit” is that the cartoon does *not* reflect the contemporary definition of telework. The woman is not working with a personal computer or any electronic connection for data transfer. In this sense, the situation shows the earlier form of commercial homework, as it was performed for years using typewriters, as the job advertisement of the Swiss electricity company Brown Boveri from 1970 illustrates (Figure 3).¹⁰⁰ Women were specifically addressed as flexible workers during periods of workforce shortage.

100 Job-Advertisement, *Brown Boveri Hauszeitung* 28, no. 7/8 (1970): 221. Many thanks to my colleague Leila Girschweiler, who shared this source with me.

Figure 3: The company was looking for wives of employees to do some work at home on flexible hours. The expression “*Fleissige Lieschen*” (diligent little Lisas) is highly gendered and suggests a trivialization.



auch nicht mehr dazu, sich vernachlässigt zu fühlen! Welches Glück für die ganze Familie! Auch seine geschäftlichen Abwesenheiten vergehen für Sie wie im Nu. Kaffeeklatsch mit Nachbarinnen können Sie mit einer guten Aurore abgucken, wobei Sie gerade noch überflüssigen Kalorien den Garaus machen.

Sicherlich haben Sie öfters schon einmal über den langweiligen Haushalt gestöhnt und über Ihre brach liegenden Fähigkeiten. Auch etwas eigenes Taschengeld können Sie doch sicherlich gut brauchen, nicht wahr?

Ausser den bis jetzt besungenen «Heim-arbeiterinnen» sucht BBC aber auch Damen, die gewillt wären, eine sogenannte Teilzeitarbeit in der Firma selbst zu leisten. Darunter verstehen wir eine feste Verpflichtung von mindestens 2 bis 3 Stunden täglich oder 1 bis 2 Tagen wöchentlich. Dafür würden wir Sie je nach Einsatz (Sprachkenntnisse) und erbrachter Leistung wie unsere ganztags arbeitenden Mitarbeiterinnen bezahlen. Eine Teilzeitarbeit bietet Ihnen die Möglichkeit zu einer modernen Lebensgestaltung für Frauen, deren Kinder z. B. bereits selbständig oder schon ausgeflogen sind. Warum sollen sie einsam und versauert den ganzen Tag zu Hause sitzen? Der Kontakt mit dem alten Beruf, mit anderen Menschen und die damit verbundene Weiterbildung wird gerade Ihnen ein grosser seelischer Gewinn sein.

Job-Advertisement, in: Brown Boveri Hauszeitung 7,8/28 (1970), 221.

So, the cartoon from Dobberthien's brochure set teleworking as continuous with well-known forms of female labor. There was nothing innovative about the new computer technologies: they were only perceived in a tech-pessimistic way, that they could further worsen the working conditions of women in locating wage labor in the private sphere.

However, in the brochure itself, Dobberthien referred critically to euphoric predictions that by 1990 a third of all employees would be teleworking from home or that up to 50% of all jobs could be decentralized. Instead, she discussed the actual diffusion of telework (around 400 teleworkers in FRG) and its technological definition. She noted also that “traditionally” 90% of homeworkers were women.¹⁰¹ A tech-pessimistic view prevailed: On a macro level, Dobberthien anticipated an erosion of labor protections, wage suppression, and deskilling; on a personal level, she identified “isolation, separation and loneliness,”¹⁰² as well as a permanent overload because of the double burdens, as problems of teleworking. This is because the form of

101 Dobberthien, *Teleheimarbeit*, 6–13.

102 Original: “Isolation, Vereinzelung und Vereinsamung,” translation by the author. Dobberthien, 25.

work means that paid and unpaid work now take place in same location. She called it a “privatization of work.”¹⁰³

In her analysis of the spatial effects of the decentralization of office work, Dobberthien observed a similar transgression as the already mentioned media historian Patton in her recently published study on the *longue durée* of homebased office work. Patton argues that communication technologies such as the telephone or the typewriter destabilized the dichotomous division of the public and the private, long before the personal computer showed up.¹⁰⁴ In this sense, telework also stands in another continuity: the effect of technology in undermining and blending the gendered spheres of home and office while maintaining the gender division of labor. But Dobberthien had a rather pessimistic attitude toward technology. She considered it cynical to refer to new technologies as “communication technologies”: rather, they should be called “anti-communication and anti-information technologies.”¹⁰⁵ Overall, Dobberthien was very skeptical towards telework and its scientific promotion, as she feared negative consequences for women. She therefore called for political measures: regulations should be introduced, and trade unions should be involved.¹⁰⁶

During the 1980s, the perception of telework as feminized work was situated in a specific context of thought. It brought together feminists’ and unionists’ criticism of the new technologies. Social scientists such as Ursula Huws investigated the effects of microelectronics on women’s office jobs. In this context, the new technologies were seen as a gender-specific “threat” because they were expected to worsen the working conditions and job security of workers in general and of women office workers in particular.¹⁰⁷ Union women focused on the negative aspects of homeworking: “double load” and the precarity of women’s work. This also stimulated gendered tech fears. In the FRG, these tech fears had a specific background in the German “Angstobjekt” automation, which was a reason why in 1983 German trade unions demanded a ban on teleworking.¹⁰⁸ Together feminist social scientists and union women formed an emotional community regarding the interpretation of telework, which was located in the fear of the effects of computerization on women office workers due to the gendered division of labor.

103 Original: “Privatisierung von Arbeit,” translation by the author. Dobberthien, 33.

104 Patton, *Easy Living*.

105 Dobberthien, *Teleheimarbeit*, 25n.

106 Dobberthien, 34–38.

107 Werneke, *Microelectronics and Office Jobs*; Vogelheim, *Frauen am Computer*.

108 “Stopp der elektronischen Heimarbeit!,” *SMUV-Zeitung*, February 29, 1984, 83; Winkelmann, “Wende oder Wandel?,” 129.

De-gendering of the telework debate in interdisciplinary research programs from the mid-1980s onward

What we encounter in the intellectual telework debate up to the mid-1980s is a US technic-euphoric and male-led vision of decentralized office work and in reaction a European skeptical gender-sensitive view of this work through feminist union women and social scientists. This development of the debate led to different reactions. On the one hand, there were attempts to broaden debate and change the gender-specific notion of teleworking. On the other hand, Anglophone feminist scholars engaged in STS made a theoretical contribution to telework by analyzing the interdependencies between gender and technology. Both responses offered a different and more nuanced emotional connotation of telework.

By the 1980s, gender had become a central topic in the public and academic debate on telework. But despite the lively and controversial debate, there were only a few teleworkers and there was not much information about them or their working conditions. The data showed that earlier euphoric predictions about the spread of telework were far from reality: by 1987, the German economist and social scientist Joseph Huber counted only about 100 persons teleworking in the FRG; worldwide approximately 10,000.¹⁰⁹ This observation of less teleworking in practice grew important and motivated the scientific interventions which aim at a positive reinterpretation and possible realization of telework.

From the mid-1980s onwards, in reaction to the small number of teleworkers, there were some efforts to encourage this form of work. Scientists of various disciplines such as geography, engineering, architecture, economy, law, and sociology launched research projects in European countries.¹¹⁰ They were part of larger state-funded programs which were occupied with so-called “socially responsible technology design” (*sozialverträgliche Technikgestaltung*) or “humanizing” working conditions (*Humanisierung des Arbeitslebens*).¹¹¹ The research programs were meant to address fears regarding the social effects of the new technologies. The scientists involved followed the perception of living in times of technological change and that a “new society” like the “information society” or “knowledge society” was coming. The scientists cross-referenced each other (starting with Nilles and Toffler) and thus established a transnational scientific network to actually implement teleworking.

To implement teleworking, the research projects wanted to establish another connotation of the work form. The key argument was that teleworking from home would only represent one form of teleworking, and not the preferred one. Rather,

109 Huber, *Telearbeit*.

110 Aichholzer and Kirschner, *Telearbeit in europäischen Nachbarschaftsbüros*; Rey, *Mobile Arbeit in der Schweiz*.

111 Kleinöder et al., “Humanisierung der Arbeit.”

forms such as so-called teleworking centers and satellite offices were presented as the desirable ones.¹¹² Teleworking in shared offices had been tested in pilot projects in many European countries, such as Nykvarn in Sweden and Benglen in Switzerland.¹¹³ But these projects were all temporary. One result was that there were financial and technical problems which first had to be solved before teleworking could be established. In particular, the high costs for the telephone connection for data transfer and the fact that devices were not widespread were among the reasons why the projects were halted.

In what follows, I illustrate these scientific interventions using a West German example: the study of the aforementioned Joseph Huber included an orientation toward the future in its title, calling telework a “vision” (*Zukunftsbild*) and a “political issue” (*Politikum*).¹¹⁴ The publication was part of a FRG research program on socially responsible technology design.¹¹⁵ There were attempts to end the association of teleworking with women’s work. Therefore, the work form was placed (again) in a broader social context, but ecological questions were also important. Huber included settlement structure, the environment, transportation, the welfare state, and productivity in his study. The issue of “teleworking and women” was only one of many. Instead, positive arguments were promoted more strongly in order to overshadow critical considerations that could have hindered implementation. I interpret these attempts to promote telework by the research program as a reaction to the gendered politicization of teleworking as women’s work from home by (German) union women. For this reason, other considerations came to the center.

A main focus of Huber’s inquiry was the renegotiation of the office in terms of space. The research design was embedded in ergonomic issues and theoretical approaches aimed at “humanizing work.” The “relationships in the family” also played an important role here, as it did in Toffler’s idea of “The Electronic Cottage.” The focus was no longer on gendered working conditions and the situation of female (tele)workers, but once again on the family as a social and economic unit. Historian Michael Homberg and others also point out in their recently published study the growing importance of the family-related argumentation in favor of telework in the UK and FRG, especially since the 1990s.¹¹⁶ Furthermore, spatial planning and economic considerations on the relationship between urban and rural areas were important. In general, teleworking was discussed in terms of decentralization or

112 Huber, *Telearbeit*.

113 Qvortrup, “Telework,” 90–93.

114 Huber, *Telearbeit*.

115 These huge research programs on “computerization” and societal change have recently come to the attention of historical research: see e.g. the conference of the Friedrich-Ebert-Stiftung “Perspektiven menschengerechter Arbeit: Gestern, Heute und Morgen,” October 9–10, 2024.

116 Homberg et al., “From ‘Home Work,’” 89n.

spatial flexibilization.¹¹⁷ It was a return to Nilles' concept of "telecommuting," by dissolving the spatial notion of Toffler's "Electronic Cottage" while at the same time reactivating its family-oriented promise.

By dissolving the spatial link to the private sphere, the gendered notion of telework faded. The interest in gendered effects was secondary in Huber's study and similar ones. The aim was to refocus the debate and move away from equating teleworking with women's work and working from home (and its negative aspects). However, this did not make gender irrelevant; on the contrary, there was a shift toward men as teleworkers and an implicit ideological shift to telework as men's work.¹¹⁸ This shift was based on the reconceptualization of telework as skilled labor with a professional identity which is related to the masculinization of computer work in general. Hicks notes for the British context that this process of (re-)gendering of computer technology was complete by the end of 1980s.¹¹⁹

Overall, the research projects on telework were similar: teleworking was tested in pilot projects and promoted as the work form of the future. The focus has shifted from homebased office work to so-called satellite offices and teleworking centers: there was an attempt to relocate telework from the private into the public sphere. The aspect of gender was still mentioned, but only as one aspect of teleworking beside others, while there was a shift to male teleworkers. This reconceptualization of telework, which developed from a narrow, gendered view to address a variety of issues, became the basis for implementation attempts in the 1990s by a broad variety of actors such as companies like IBM, commissions for equal opportunities, or public administration.¹²⁰ Private and public institutions launched their own teleworking-programs and the first regulatory efforts were made.¹²¹

Telework and the co-construction of gender and technology: A new theoretical approach by feminist STS-thinkers

Besides this practical approach to implement teleworking, there were also some more theoretical reflections on the new form of work from the mid-1980s. In particular, technoscience was more and more investigated and theorized by feminist social scientists. They shared with union women a consciousness of the gendered effects of the new technologies.¹²² But these STS oriented scientists argued differ-

117 Huber, *Telearbeit*; Stadler et al., *Gegen/Wissen*.

118 Winkelmann, "Vom Risiko zur Verheißung."

119 Hicks, *Programmed Inequality*, 231n.

120 Winkelmann, "Wende oder Wandel?," 131–34.

121 Homberg et al., "From 'Home Work,'" 80n.

122 Schöll and Küller, *Micro Sisters*.

ently. Their analysis formed the basis for the field of gender-oriented studies of science and technology. Through their analyses, they not only intervened in the international discussions about teleworking but also formed an intellectual network and scientific community of their own.

In the 1980s, the British social scientist Cynthia Cockburn stated that technology is gendered at all levels. Cockburn was a pioneer in the field of feminist critique of technology and carried out studies on the effects of computerization such as in the printing industry. She investigated the effects of new technologies when they were introduced.¹²³ She argued that the gendering of technologies and related tasks determine access, exclusions, the status of the employee, and thus the gender segregation of the labor market. She identified especially processes of (de-)skilling as crucial. These processes were gendered and embedded in the patriarchal capitalist system.¹²⁴ The first sentence of her book on technological change in the printing industry presents her key argument in a nutshell: "This book began as a study of the human impact of technological change. It has ended as a study in the making and remaking of men. It is also about the uses to which men put work and technology in maintaining their power over women."¹²⁵ In the case of transformation in work organization (such as through new technologies), male workers would organize themselves in such a way that these went in their favor.¹²⁶

In the early 1990s, the Australian sociologist Judy Wajcman further developed Cockburn's thesis on the male character of technology culture into the social co-construction of technology and gender identity. In this process, emotions toward technology played a significant role. Wajcman discussed changes in social organization of office work as a result of computerization.¹²⁷ She argued that in offices, firstly, a particularly large number of women are employed and thus affected by the "micro-electronic revolution" and, secondly, the gender-specific segregation of professions and hierarchies is imminent. Here she is in line with the diagnosis of earlier studies such as the discussed example by Ursula Huws. Wajcman then turned to teleworking, which she had researched in Australia. She noted that this form of work is still primarily a vision of the future and that only a few people were working in this way. The social scientist noted further that teleworking would affect different employment relations and conditions differently and therefore would affect men and women differently. She explained that "[i]t is only for male professionals who possess

123 Cockburn, *Brothers*; Cockburn, *Die Herrschaftsmaschine*.

124 Cockburn, *Brothers*, 5n; Cockburn, *Die Herrschaftsmaschine*, 17.

125 Cockburn, *Brothers*, 3.

126 Cockburn, *Die Herrschaftsmaschine*, 20n. Interestingly, this book is only translated into German. The translation was paid for by the women's group of the social democratic party. This highlights the significance of this gendered debate in the FRG; see Cockburn, *Die Herrschaftsmaschine*, 7–9.

127 Wajcman, *Feminism Confronts Technology*, 27–53.

skills which are in short supply that new technology homework presents an unambiguously attractive choice."¹²⁸ As she put it, teleworking was "a stark example of the reproduction of women's traditional position in the new electronic age."¹²⁹ Wajcman agreed with the notion of a new societal phase, ushered by the new technologies, but in contrast to the futurists, she mainly focused on the gender-specific effects. With this focus, she questioned the narrative of the new in connection with the "digital revolution" and instead revealed continuities with the past.¹³⁰ By pointing out the conservative effects of the new technologies regarding the gendered organization of labor, Wajcman argued the same way as the union women did.

The achievement of feminist technology criticism lies in the non-deterministic view of the gender-specific effects of technologies on social structure. The focus no longer relied only on women but also on men and how they profit from the male shaping of technology. So, this was a double political intervention: On the one hand, feminist social scientists broke with the technology-driven imagination of the futurists. Rather they insisted on gendered effects and capitalist continuities. On the other hand, they distanced themselves from an essentialist view, which in part characterized feminist positions on technology, such as the mentioned "female tech-fear" of the union women.¹³¹ Wajcman summarizes this approach: "The key issue here is whether the problem lies in men's domination of technology, or whether the technology is in some sense inherently patriarchal."¹³² As soon as the problem was localized "in men's domination of technology" (and not in the technologies themselves), it was no longer about turning away from it, but rather tapping its potentials. In the wake of this analysis, emotions toward technology appeared as a question of gender and of emancipation. This was the beginning of feminist calls for the female appropriation of technologies; it paved the way for tech-positive feminisms, such as the cyberfeminism that emerged in the 1990s.¹³³ And this had implications for the politicization of teleworking: While the German unionists demanded a ban on teleworking in the early 1980s, by the 1990s it was promoted by companies, equality officers, and politicians as a useful strategy for gender equality.¹³⁴

The interventions of scholars such as the German economist Huber or the English-speaking feminist social scientists such as Cockburn or Wajcman show that transnational variations of the telework debate emerged at the end of the 1980s. Both interventions related to the prevailing technical-deterministic interpretation

128 Wajcman, 42.

129 Wajcman.

130 Balbi, *The Digital Revolution*.

131 Dommann, "Umbrüche am Ende der Linotype."

132 Wajcman, *Feminism Confronts Technology*, 13.

133 Cockburn speaks out in favor of self-organized computer courses for women, Cockburn, *Die Herrschaftsmaschine*, 23; Baumann, "Gleichstellung dank Internet."

134 Homberg et al., "From 'Home Work,'" 80n.

of teleworking, which imagined the form of work either in a (gender-blind) utopian way or with a complete focus on women's work. The interventions were intended to nuance and vary the debate. These variations differed in their approach: while the interdisciplinary research projects pursued the goal to realize telework as a work practice, the feminist theorization of gender–technology relations emphasized the ability to alter them. The reorientation of the intellectual teleworking debate also totally changed the scientists' feelings regarding teleworking and computer technologies: the strong emotions – euphoria and fear – were replaced with a more pragmatic attitude toward *Technikemotionen* related to computerization. This shaped a gender-neutral concept of teleworking. This was the starting point for various attempts by different actors to apply this form of work in the 1990s.

Conclusion

By the end of 1970s, Nilles and Toffler saw telework as a technology-driven vision for society as a whole, implicitly taking the US as a model for the rest of the world. This early conception was embedded in a specific scientific network concerned with the future, in which technology would serve for the better. Such visions of “a new society” were all devised by men, gender issues were not discussed critically. Nilles' original concept of “telecommuting” offered solutions to traffic problems and the environment. Futurist Toffler then saw “The Electronic Cottage” as a solution to family issues and against alienation. Telework, they felt, would bring about a new and better society through new technologies. So, both represented a rather optimistic view of computerization in the logic of a technological fix for social problems. By influencing not only the notion but also the visionary character of telework, Nilles and Toffler were the beginning of the teleworking debate and as such repeatedly mentioned in subsequent research on the topic.

In the early 1980s, in the course of intensified computerization, the idea of teleworking spread internationally and the debates on telework operated increasingly around gender. In Europe and especially in the FRG because of the national discourse of German *Angst*, union women like Dobberthien feared a further marginalization of women office workers by the impacts of the new technologies. Contrary to its early conceptualization as a non-gendered phenomenon, telework now appeared solely as a form of women's work. This was due to its association with (electronic) homeworking. Telework was no longer conceived as futuristic, but as antiquated. The impacts of the new technologies were viewed with skepticism on behalf of women: it was feared that they would reinforce patriarchal oppression in working (and family) life. As a result, the narrative of a so-called specific female “tech fear” emerged around teleworking. So, the gendering of the work form has changed as well as the gender of those who politized it.

This was the state of the debate by the mid-1980s. There were different reactions to it. One reconceptualization of telework was performed by European scientists from various disciplines. They followed a similar argumentation as the US futurists, highlighting the various benefits of teleworking. In research projects on the “humanization of work,” social scientists, geographers, and economists such as Huber focused on telework in so-called satellite offices or teleworking centers, rather than at home. In doing so, they broke with the spatial gendering of teleworking from home. Instead, they promoted telework as a desirable and promising way of solving traffic and environmental problems, as well as family and gender equality issues. They returned to the early vision of teleworking as a means to create a new society by incorporating some sort of gender awareness. They reactivated the utopian idea of teleworking as a technological fix. These visions again were implicitly male. Because of the male dominance in science, most researchers concerned with telework were male, and they imagined mainly male teleworkers in decentralized offices.

English-speaking feminist social scientists like Cockburn and Wajcman also intervened in the debate. They did so in a twofold way by grounding a theoretical approach in relation to gender and technology. On the one hand, they took a stand against the gender blindness of their academic colleagues in STS. They argued that even technologies as such are gendered, that they have different effects on women and men, and that as long technology is (also culturally) dominated by men, technologies serve patriarchy. In this way, they established the feminist critique of technologies as part of their discipline. On the other hand, they opposed the technodeterminism of the women’s (labor) movement, according to which technology was detrimental for women. As representatives of feminist technoscience, they advocated for women to adopt new technologies in order to overcome male dominance in technical culture: technological change should be released from patriarchal uses and instead help to create a better and new society. In this way, they reactivated a positive and emancipatory notion of technology. Teleworking, however, they saw in connection with the gender-specific division of labor. As long as this division persisted, telework serve it.

The recap of the controversial transnational debate on teleworking reveals the dominance of scientific (often also political) actors and offers insights into (theoretical) developments in the social sciences. These developments were gendered – its protagonists as well as its imaginations. The close reading of early important publications on teleworking has shown how ideas of the “new societies” served as spaces for negotiation on whether technologies would be enablers, threats, or irrelevant in the course of the expected economic and technical transformations. It becomes clear that these views were shaped by feelings about technologies as well as technological change – and that these emotions themselves were gendered as well. So, technology, emotions, and gender emerge as an intertwined complex with different national and cultural backgrounds. This complex constituted different attitudes

towards telework. Based on these attitudes, different scientific networks and emotional communities were formed that shaped the gendering of telework in different ways.

The close reading also reveals another shift in the gendering of telework from the mid-1980s, toward a genderblind and as such implicitly male notion of the work form. This shift followed the mechanisms described in the feminist critique of technology as the patriarchal complex of work, class, gender, and technologies: the new focus regarding teleworking was on skilled jobs with a high degree of autonomy and technical know-how, which often applied to managers – and these were predominantly men. This change in the gendering of computer-based labor from female to male workers is also described in the social and gender-oriented historiography of computers.¹³⁵ The telework debate reflects this development. In that sense, the analysis confirms the importance of the social sciences in the early stages of remote work organization. Teleworking served as proxy for thinking about the relationship between work and the new computer technologies in the anticipated “new society.”

Finally, a brief outlook: there was a fundamental change in the 1990s. Teleworking was no longer a mainly scientific project but put into practice by new actors such as companies, public administrations, or equality institutions.¹³⁶ The tone of the debate completely changed. It was no longer about imagining the “new society” and teleworking as part of it (or as a means to reach it). It was about shaping workplaces in a way that made teleworking a realistic option. In the course of this, the liberalization of telecommunications in European countries was legitimized in part with reference to the promotion of telework.¹³⁷ This was a further step in the lengthy and ambiguous development toward remote work as we know it today. Since the Covid-19 pandemic the gendered effects of decentralized office work have reemerged as a lively topic of discussion – in science and among the public.

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135 Hicks, *Programmed Inequality*.

136 Lüthy and Rüeegger, *Vernetzte Arbeitsplätze*; Winkelmann, “Wende oder Wandel?”; Homberg et al., “From ‘Home Work’”; Homberg and Winkelmann, “Home Is Where the Office Is.”

137 Winkelmann, “Wende oder Wandel?,” 135–38.

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