From Telegraphs to AI: The Gendered History of Feminized, Affective Labour in Communication Technologies

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Abstract

Women's underrepresentation in high-tech roles derives from the historical, political and economic forces embedded in communication technologies. The advancement of Artificial Intelligence risks deepening this gender gap by replicating and displacing feminized labour. This paper employs a feminist, Marxist, political economy framework to examine the historical and contemporary marginalization of women's labour in communication technologies. Henceforth, this paper asks, 'How has the historical feminization of women's labour in communication technologies shaped the structural gender gap in today's digital economy?". Tracing the feminization of women's labour from the telegraph, typewriter and telephone to modern technologies like the computer, social media and AI, this study exposes the patriarchal social dimensions of communication commodities that maximize profit through feminized labour while isolating women to subordinate, 'soft' roles. Findings emphasize that historically, women's affective labour was deemed economically suitable to operate communication technologies due to traits stereotypically associated with femininity, through attentive, emotional and submissive behaviour. Although female labour was foundational to technological advancement, this work was precarious. Simultaneously, the female gender became naturally attached to the identity associated with communication technologies. In today's digital economy, women retain soft roles as social media labourers. Artificial Intelligence, exemplified by female digital voice assistants, mechanizes this feminized labour. Traditional gender norms have been embedded in digital systems, where AI automates the affective labour historically performed by women, intensifying their displacement to precarious gig work and reinforcing historical inequities. By illuminating the social forces shaping communication technologies, this paper argues that the persistent gender gap in the digital economy is rooted in the historical feminization of labour. As AI automates affective labour, it is apparent that communication technologies are primed to continue excluding women from an industry ripe with power and profit.

Keywords

Political economy of communications, Feminist political economy, Political economy, Political economy of labour, Affective labour

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Women's Underrepresentation in Tech

As technological innovation advances towards a future reliant on Artificial Intelligence (AI), women remain significantly underrepresented in high-paying information and communication technology (ICT) jobs, the widest gender disparity of any discipline (Hegewisch et al., 2019, pp. 39, 46; UNESCO, 2019a, as cited in Collet et al., 2022, p. 39; Vu, 2023, para. 1). Despite efforts to increase the participation of women in the workforce, only 24 per cent of tech workers across Canada are women (Vu, 2023, para. 1). Across the technologically advanced, G20 nations, only seven per cent of ICT patents are created by women (West et al., 2019, p. 5). The pay gaps, increased difficulty in attaining senior positions, gender biases and common placements to precarious roles remain prevalent, systemic barriers that compromise women's representation in the upper echelons of the tech industry (Collet et al., 2022, p. 12). Low female participation in ICT makes the industry male-dominated, excluding women from coding the technologies of the digital economy, which both limits women's economic advancement and impedes global economic growth (Hegewisch et al., 2019, pp. 39, 46; Holder, 2019, para. 5; Hupfer et al., 2021, para. 2; Munshi and Wakefield, 2024, para. 9; O'Mara, 2022, para. 2; Ozdenoren, 2023, para. 3; Vu, 2023, para. 1; West et al., 2019, pp. 5, 16, 33). Today, the technological prominence of social media, AI and automation reflects the "'fourth industrial revolution'" (Schwab, 2016, as cited in Wajcman and Young, 2023, p. 47). Despite being new media, the patriarchal power-dynamics of old media continue to be perpetuated in these technologies by inflating women's economic marginalization. Technology wields power, yet women remain deeply absent from its frontline. As innovation continues, women's largest occupations are increasingly at risk of replacement by automation from AI tools (Hegewisch et al., 2019, p. 52; Ozdenoren, 2023, para. 3). Analyzing women's marginalization in the digital economy requires a feminist, historical, political economic examination of their labour in early communication technologies.

Feminist, Marxist, and Political Economy of Women's Labour in Communication Technologies

This paper utilizes a feminist, Marxist, political economic approach to examine the gendered social relations of communication commodities and labour that became feminized. The political economy of communication interrogates the power relations that guide the distribution

of communication technologies as commodities (Mosco, 1988, p. 3, as cited in Lee, 2006, p. 191). Importantly, Marx identifies this power as a set of social relations that are integral to the functionality of capitalism (Fuchs, 2018, p. 522; Mosco, 2009, p. 4). Comprising the 'political' power aspect of political economy, these social relations include the commodity, labour, and exploitation as socially constructed features of the economic system (Fuchs, 2018, p. 522). Feminist political economy perceives these social relations as gendered and historically constructed (Martin, 1991, p. 6). Further, understanding the materiality of these social relations necessitates a theory of history where, "(f)or Marx, history meant, above all, how people make themselves through labor" (Mosco, 2009, p. 4).

Henceforth, I combine a feminist political economy perspective with Marx's historical materialism to ask, 'How has the historical feminization of women's labour in communication technologies shaped the structural gender gap in today's digital economy?'. Tracing the historical feminization of women's labour across key communication technologies, I examine the contours of a patriarchal capitalist system that profits and maintains a male-dominant power structure by relegating women to the 'soft' roles of affective labour. I argue the underrepresentation of women in tech originates from the early communication industry's commodification of feminine gender norms. As such, I reveal how these gender constructs persist in today's digital economy, as AI perpetuates the historically feminized role of affective labour through voice assistants, displacing women from the workforce that early communication technologies created while reinforcing their economic marginalization by driving them into precarious labour.

A Historical Analysis of Women's Feminized, Affective Labour

The Telegraphist

As one of the earlier mechanized forms of communication technology, women dominated the telegraph's labour market, where work was feminized and tied to women's affective traits. Specifically, the term 'affective' refers to the emotional qualities of female behaviour that infuses itself into labour. Affective traits relate to emotional capacities, such as one's aptitude to care, listen, comfort, smile, and be gentle, and appeal to a gendered kind of labour as these characteristics have been historically constructed as female qualities (Altomonte, 2015, para. 1; Bergen, 2016, pp. 102-103). Hence, 'affective' labour references work that relies on the labourer to provide an emotional service to the consumer that creates what Bergen (2016) notes as an

"affective change" (pp. 102-103), highlighting the comfort or positive feeling that a consumer receives from the interaction. This work usually focuses on administrative, secretarial tasks that build and sustain client relationships, serving consumer needs best with a patient, sympathetic and flirty feminine persona (Bergen, 2016, p. 104; Duffy and Schwartz, 2017, p. 2975).

To study the historical construction of women's attachment to affective labour in early communication technologies, a combination of a feminist, Marxist perspective of labour highlights how patriarchal gender norms confined women's work in early communication technologies to roles that expectantly mobilized their emotional work. These gendered social relations granted women wages only upon conforming to patriarchal values that positioned women as the submissive, caregiving sex. Telegraphy arose as a gendered occupation, with women dominating Canada and the United States' telegraph labour market by the late 1800s (Balka, 2002, p. 60; Standage, 1998, p. 105). This commodity profited from the feminized labour that was exclusively sourced from the attentive nature and nimble fingers of young women (Mullin, 2016, pp. 2, 21).

Despite supporting the formation of a working women's middle class, the telegraph, a product of a patriarchal capitalist system, exploited women's labour and reinforced domestic gender norms. Telegraphists provided "ten hours a day, six days a week" (Standage, 1998, p. 105) of tedious labour; a skill that women had honed through long hours of housework spent knitting or playing an instrument (Standage, 1988, p. 105). It was women's soft, caregiving demeanour that best suited them as telegraph operators, channelling their perceived emotional traits into an 'affective' sort of labour that required their femininity. Hence, the telegraph established the female gender as innately tied to the operation of the machine (Mullin, 2016, p. 19). Women's affective labour continued to be sourced in emerging communication technologies like the typewriter and the telephone, fuelling the commodity's profits, while alienating women to secretarial roles as the preferred mediators of communication technologies.

The Typewriter and The Telephone Operator

Like telegraphy, the occupation of the typewriter and the telephone operator relied on the type of feminized, affective labour deemed best suited to women. Typing emphasized "(w)omen's slighter fingers" (Mullin, 2016, p. 5), while the telephone operator required women's "'skillful hands'" (Martin, 1991, p. 59) and a soft, "even-tempered" voice (Watchman, 1898, as

cited in Martin, 1991, p. 59). Women's distinct, constructed femininity enabled both commodities' success as an economic product through the feminine, adept typing of the scripts required by male colleagues, or by manually connecting the company to its customers as telephone switch operators (Bergen, 2016, p. 103; Martin, 1991, p. 12). Profit was contingent upon women's affective labour through their 'natural' ability to fulfill the emotional, strenuous labour requirements as the typewriter and telephone's mediator.

Initially male-dominated, telephone operation became a female role as the gender whose "personalities were 'better suited' to the work" (Martin, 1991, p. 52) than men's short temperaments (Jewett, 1936, as cited in Martin, 1991, pp. 54-55). Gender is an integral social relation tied to communication commodities, where "the female operator was considered 'the most valuable asset that a telephone company possesses'" (Bell Communication Archives, 1904, as cited in Martin, 1991, p. 59). However, the typewriter and the telephone isolated women's work within new occupations that provided no opportunity for career growth, little pay, and poor working conditions (Lipartito, 1994, pp. 1077, 1085, 1088; Martin, 1991, p. 60). The correlation of technological innovation to women's economic marginalization and the exploitation of their labour persists in computing.

The Computer Operator

As computer technology progressed, women were shunted from jobs in coding as the first 'computer operators' and sequestered to the feminized roles of 'soft' ware. During World War II, women powered ENIAC, America's first computer, automating complex mathematical calculations (Hicks, 2017, as cited in Wacjman and Young, 2023, p. 53; Hicks, 2018, para. 5; Light, 1999, p. 455; Thompson, 2019, para. 7, 26; West et al., 2019, p. 20). Importantly, women's role as the "'computer operator'" (Light, 1999, p. 469) positioned them as intermediaries of the machine, or society's early coders. The computer labour market, like earlier communication technologies, relied on the feminized labour of female operators to power the commodity.

The significant gender gap in today's coding occupations (Carretero et al., 2017, as cited in West et al., 2019, p. 5; Hegewisch et al., 2019, p. 43; UNESCO, 2019a, as cited in Collet et al., 2022, p. 40; Hupher et al., 2021, para. 2; Munshi and Wakefield, 2024, para. 9; O'Mara, 2022, para. 2; Vu, 2023, para. 1; Zhang et al., 2021, as cited in Collet et al., 2022, p. 40) is connected to the computer's early association as a site of male power during the ENIAC project,

as the commodity advanced and ushered in new ways of processing information. During this gendered pivot, women were isolated to the feminized roles of 'soft' ware. The ENIAC project reinforced gendered roles, where "designing hardware was a man's job, programming was a woman's job" (Light, 1999, p. 469). Thus, software roles became associated with the traditional attentiveness of female labour (West et al., 2019, p. 20). Women's occupational feminization continued to reproduce their subordination to the service-oriented roles of technology, while coding occupations became dominated by the male-exclusive culture of a patriarchal, capitalist system.

Women's Economic Marginalization in Today's Digital Economy

The Social Media Content Creator

Women comprise the undervalued 'soft' roles in today's digital economy, including the feminized, affective labour of social media. While women represent only 25% of technical roles in large tech companies (Hupfer et al., 2021, para. 2; O'Mara, 2022, para. 2), they makeup 70 to 80 per cent of the social media workforce (Balonon-Rosen, 2018, para. 5; Escaño and Prodanovic, 2023, p. 54; Hempel, 2018, para. 3). Female social media managers and content creators perform affective labour by engaging with online audiences, building brand-consumer relationships and easing customer frustrations through their empathy and attention to detail (Balonon-Rosen, 2018, para. 10; Duffy and Schwartz, 2017, pp. 2973, 2975, 2981, 2982-2983; Hempel, 2018, para. 12). The 'soft' skills that are associated with affective labour in a patriarchal, capitalist economy are undervalued despite its emotional toll. Within the news industry and platform economy, social media is one of the few occupations where women outnumber men in leadership roles (Escaño and Prodanovic, 2023, pp. 54-55; Levinson, 2015, para. 4). However, these roles afford women no growth in political, economic or social power as they remain invisible workers behind such accounts. Therefore, gendered occupational divides in the digital economy appropriate feminized, affective labour to ensure the online brand's maximum profit while maintaining women's underrepresentation in high-tech roles. Consequently, women's underrepresentation in tech heightens their risk of displacement by automation.

AI, Automation and Gig Work: The Female Digital Voice Assistant

The newest innovation in an increasingly digitized economy, Artificial Intelligence, replaces the administrative jobs created by earlier communication technologies. Women comprise a small portion of high-tech jobs**,** representing 24 per cent of tech workers in Canada (Vu, 2023, para. 1), less than one-third of the global tech workforce (Munshi and Wakefield, 2024, para. 9) and 10-15 per cent of AI researchers at the top technology companies (Stathoulopoulos and Mateos-Garcia, 2019, as cited in Wajcman and Young, 2023, p. 50; WIRED and Element AI, 2018, as cited in West et al., 2019, p. 88). Mostly, women remain concentrated in the administrative, secretarial roles that AI tools seek to replace (Ozdenoren, 2023, para. 2, 3). The legacy of women's historical marginalization to affective labour created a confined, occupational reliance on the secretarial, soft roles of the digital economy.

Now, feminized roles that favour women's affective labour with technologies like the telephone and computer, such as data collection and administrative support, are most at risk of being replaced by automation (Agar et al., 2018; Balka, 2002, p. 73; Frey & Osborne, 2017, as cited in Collet et al., 2022, p. 32; Hegewisch et al., 2019, pp. 16, 26, 28, 29; Servoz, 2019, as cited in Collet et al., 2022, p. 33; Manyika et al., 2017a, as cited in Hegewisch et al., 2019, pp. 11-12; Marr, 2024, para. 2). As such, women comprise 47 per cent of the United States workforce but 58 per cent of those whose jobs are most at risk of automation (Hegewisch et al., 2019, p. 11). While automation replaces women's work, it retains traditional gender norms through the affective, now mechanized labour of female digital voice assistants like Apple's Siri, Amazon's Alexa and Microsoft's Cortana.

Digital voice assistants act as automated secretaries, reinforcing female gender norms of care and occupational subordination (Bergen, 2016, p. 103; Collet et al., 2022, pp. 10, 26; West et al., 2019, p. 4). Coordinating the words and requests of primarily male customers or male-owned businesses, technology's female identity reflects women's historical role in serving male interests as the mediator of communication technologies. Female voice assistants like Siri, Alexa and Cortana support the profit-driven, patriarchal initiatives of capitalism by performing the invisible, always-on labour that relies on the user's "associations between the feminine and affective labour" (Bergen, 2016, p. 97). This affective labour echoes the work of telephone switchboard operators, as mobile phone voice assistants respond to more than one billion requests per month (UNESCO et al., 2019a, as cited in Collet et al., 2022, p. 61). Further, as

female telephone operators "possessed a 'good voice'" (Watchman, 1898, as cited in Martin, 1991, p. 59), Apple and Amazon selected a female voice assistant because "people prefer a female voice to a male voice" (Sey and Hafkin, 2019, as cited in, West et al., 2019, p. 95). As such, the profit-guarantees of affective labour maintain communication commodities as a site of male power and capital, while this automation pushes women into precarious gig work.

Through a feminist lens, female digital assistants reinforce female gender constructs of submission through the commodity's coding to placate toxic complaints and verbal harassment, akin to the work of female telephone operators and social media managers. Having been created by male-dominant teams (West et al., 2019, p. 100), these digital assistants lack agency or coding to counter harassment. In its infancy, Siri replied to insults like "You're a bitch" with "I'd blush if I could", while Alexa and Cortana offered similarly placating responses (UNESCO, 2015, as cited in West et al., 2019). Today, Siri continues to dodge verbal abuse without explanation, through neutral responses like, 'I won't respond to that'. As the digital economy progresses, voice assistants are not only housed in mobile technology but are implemented throughout software, aiming to enhance companies' operational efficiency. For example, GreenWorks ESG, a software for companies to manage their Environmental Social Governance (ESG) data, is powered by Ellie, a female AI assistant able to sort through spreadsheets, pinpoint data, and provide ESG recommendations (GreenWorks ESG, n.d.).

A subtle but powerful gendered shift in work, AI virtual voice assistants automate and replace traditionally female occupations, pushing women into precarious gig work in the platform economy. In Canada, women consistently outnumbered men in gig work from 2005-2016 (Jeon et al., 2021, as cited in Salter, 2023, p. 7), a number that widens year over year as AI becomes more sophisticated. Recently, gig work includes labour that promotes heavy surveillance, such as data labellers, content moderators, and domestic or customer service work provided by digital platforms (Collet et al., 2022, p. 34; Holder, 2019, para 21; Salter et al., 2023, p. 19; Williams et al., 2022, para. 3). Gig work commodifies women's labour through a "highly gender segregated" (Hegewisch et al., 2019, p. 51) system that values labour through client ratings on digital apps like Uber and Task Rabbit (Hegewisch et al., 2019, p. 51; Ziegler et al., 2020, as cited in Salter et al., 2023, p. 7). Client ratings expose women to gender discrimination and lower pay, while gig work keeps workers alienated from traditional workplaces (Salter et al., 2022, pp. 20, 36). As such, automation replaces women's affective labour while reproducing

traditional gender norms, further subordinating women to the power of a patriarchal, capitalist digital economy that determines women's isolated work and low pay.

Conclusion

Female digital voice assistants replicate women's historic role as mediators of the telegraph, typewriter, telephone and computer. These feminized communication roles, historically and in today's digital economy, reflect a patriarchal capitalist system that maximizes profit from gendered commodities and reinforces women's inferiority in economically stratified, feminized and undervalued, soft labour roles. Today, AI has begun to impact this affective labour, displacing service and administrative jobs primarily held by women with interactive digital voice systems (Balka, 2002, p. 73). This digital shift sustains domestic gender norms; while companies profit from feminized digital assistants, these gender stereotypes perpetuate the historical norm of women's role in caregiving by "articulat(ing) out of date views in a high-tech vernacular" (Collett et al., 2022, p. 26). AI not only jeopardizes specifically women's labour (Reuters, 2025, para. 1) but also reinforces gendered expectations that push women to find temporary, short-term labour in the growing gig economy (Das and Kotikula, 2019, as cited in Collett et al., 2022, p. 27).

Women's primary placement in communications roles of affective labour, now diminishing due to the recent development of automation, accelerates their economic marginality. As AI advances, the precarious labour of gig work becomes more viable, but does not provide greater economic opportunity. Characterized by temporary, short-term contract labour, the gig economy appears to offer flexibility, but lacks the economic stability, adequate wages, and social and health protection meant to afford workers a high quality of life (Salter et al., 2023, pp. 7, 12, 20). For women, gig work often entails platform labour, such as caregiving and cleaning services, resulting in labour of increased surveillance, instability and low pay (Salter et al., 2023, p. 22). Almost half of the US and Canadian workforce engages in this precarious sector (Salter et al., 2023, p. 12). Echoing Wajcman and Young's (2023) observation, the AI-driven expansion of the gig economy does not signal the closure of the gender gap but increases women's economic vulnerability, further limiting their access to tech positions.

Evidently, communication technologies retain the social relations of a patriarchal gender hierarchy through commodities that seemingly require feminized labour in a capitalist economy.

The gender gap in today's ICT industry reflects women's historical confinement to feminized labour roles. This paper sought to trace the historical feminization of women's labour in early communication technologies to its persistence in AI and women's continued marginalization in the ICT industry. Further communications research can explore a broader socio-cultural analysis with political economy, examining how constructions of gender inequality intersect with class, race, ethnicity and immigration status. Ultimately, it is imperative to remain critical of new technologies to examine their role in sustaining and increasing the risk of women's economic marginalization. As AI and automation become more advanced, these technologies can and do amplify systemic inequities by coding traditional gender norms into the machine while driving women into the precarious labour of gig work.

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