Automation Anxiety and Augmentation Aspiration: Subtexts of the Future of Work

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How are gender, class, and race imagined in relation to automation and augmentation in popular books on the future of work? This paper problematises intersectional inequality subtexts in books on the future of work to develop new research directions. The paper shows how automation anxiety is conceptualised as relating to the threat that men might lose their jobs. While working-class men are constructed as unable to reinvent themselves, middle-class men are presented as unable to remain the main provider for a nuclear family. Augmentation aspirations relate to how social and emotional skills are considered as future-proof, but who gets credit for displaying such skills remains uncertain. Creating and working with machines is also considered future-proof, but there are silences around inequality subtexts in relation to data, the designers, and the design of those technologies. The article suggests a research agenda that can be used to understand how inequalities emerge and how they can be diminished in discussions about automation and augmentation in the future of work.

Introduction

Since the publication of *The Fourth Industrial Revolution* (Schwab, 2016) and *The Second Machine Age* (Brynjolfsson and McAfee, 2014), myriad books have sought to make sense of changes associated with the future of work and technology, to help prepare managers, policymakers, and the general public to take appropriate actions. Books on the future of work have a long tradition (Donkin, 2010; Gratton, 2011; Maitland and Thomson, 2011) because they speak to the human need to understand and potentially ameliorate the future (Nowotny, 2021). The latest reiteration of this literature focuses on technical developments associated with digitalisation, artificial intelligence, robotics, automation, and augmentation in relation to work. As such, the future-of-work literature is of prime concern for management scholars who aim to understand phenomena such as the adoption of new technologies and digitalisation at work (Brivot, Lam and Gendron, 2014; Haak-Saheem, Hutchings and Brewster, 2022; Shankar, 2020; vom Lehn and Heath, 2022). Yet a critical analysis of the future-of-work literature is still largely missing (Howe, Hentrup and Menges, 2021; Gümüsay and Reinecke, 2022). One of the central debates in this literature asks if the future of work will be dominated by automation or augmentation; automation suggests that human jobs will be automated and thus disappear with increasing use of technology, while augmentation means that humans and machines collaborate and augment each others' skills (Raisch and Krakowski, 2021). While often constructed as opposites, it has been shown that automation and augmentation are in a paradoxical relationship and co-exist (Raisch and Krakowski, 2021).

However, this raises the question of how inequalities are considered in the latest reiteration of the future-of-work literature. A wealth of literature in business and management has analysed inequalities such as those around gender at work (Adamson and Kelan, 2019; Ashman *et al.*, 2022; Cooper *et al.*, 2021; Gatrell *et al.*, 2014; Haak-Saheem, Hutchings and Brewster, 2022; Kelan, 2014; Mavin, Grandy and Williams, 2014; Pio and Essers, 2014; Priola and Chaudhry, 2021). Such

analyses regularly draw on Acker's work (Bendl, 2008; Poorhosseinzadeh and Strachan, 2021) through concepts such as the 'gender subtext'. The gender subtext refers to implicit assumptions that exist in texts (Acker, 2012). Gender subtexts have been identified in earlier business and management literature (Adamson and Kelan, 2019; Bendl, 2008; Fondas, 1997; Kelan, 2008c; Ogbor, 2000) but have not been discussed in relation to the latest future-of-work books that focus on digitalisation. Furthermore, the gender subtext can be expected to interact with race and class subtexts (Acker, 2006, 2012), which together form inequality subtexts. Because technologies embed and amplify gender, race, and class (Buolamwini and Gebru, 2018; Wajcman, 1991, 2004), analysing inequality subtexts in the technology-focused future-of-work literature is a central concern for business and management research and can be used to develop new research questions through problematisation (Sandberg and Alvesson, 2011; Alvesson and Sandberg, 2011).

The purpose of the paper is to problematise inequality subtexts in popular future-of-work books to identify future research directions. The paper makes three contributions. First, it develops the notion of inequality subtexts. Second, it shows how automation anxiety is focused on white-collar and blue-collar jobs commonly held by men. Third, it reveals how augmentation is expressed through social and emotional skills that are deemed important yet the deeper relevance of aspects of gender, race, and class remains unconsidered. The article thereby extends the debates on the automation/augmentation paradox in the future-of-work literature by showing how problematising inequality subtexts leads to new research avenues that can cast light upon how inequalities emerge and how they can be diminished.

Inequality subtexts and futures of work

Since Acker's (1990) seminal paper, organisational structures, processes, and practices have been conceptualised as gendered. The gendered nature of organisations is visible through the abstract, disembodied, and unencumbered worker; rather than being gender-neutral, this ideal construction has been shown to be implicitly gendered as a man (Acker, 1990, 2009, 2012, 2006). Gender is also visible in how men and women are constructed:

men appear as active agents, whereas women are cast as providing emotional support (Acker, 1990). Central to gendered organisations is the gender subtext. While gendered substructures in general include processes, organisational cultures, interactions, and identities, the gender subtext forms part of the gendered substructure of organisations but refers specifically to text such as guides, memos, and policies (Acker, 2012). The gender subtext includes, for example, the belief in essential gender differences, such that women are nurturing and caring and are providing unpaid work in the home, whereas men are assumed to be good with technology and to be in paid employment. Gender subtexts have been widely used to analyse gender in organisations (Benschop and Doorewaard, 1998a; Kelan, 2008b; Bruni, Gherardi and Poggio, 2004; Benschop and Doorewaard, 1998b). The gender subtext is particularly useful for studying written material such as texts or books (Bendl, 2008). Researchers have shown that management literature has a gendered subtext (Bendl, 2008), that management literature draws on ideals associated with femininity without acknowledging this feminisation (Fondas, 1997), and that management books display gender awareness, with women being constructed as the new ideal workers (Kelan, 2008c).

Acker (2006) reworked gendered organisations through the concept of inequality regimes. Acker defines inequality regimes 'as loosely interrelated practices, processes, actions, and meanings that result in and maintain class, gender and racial inequalities within particular organizations' (Acker, 2006, p. 201). Inequality regimes thus make use of intersectionality, an analytical framework to show how different forms of inequalities interact and thus create unique relations to power (Crenshaw, 1991; McCall, 2005; Nash, 2008; Kelan, 2014). While Acker draws on the gender subtext as outlined above, she also specifies the class and race subtexts. Acker uses class to denote 'differences in access to and control over resources' (Acker, 2006, p. 444). CEOs of larger organisations, for instance, take elite positions in society and are often men, whereas women were for a long time confined to lower-level work (Acker, 2006). The neoliberal assumption that individuals are responsible for their own position in the labour market, is concealed in 'management' discourses and is a class subtext (Acker, 2012). However, often such class structures are hidden beneath individualisation; in modern

societies, it is often presumed that it is one's own choices that are responsible for success and failure rather than traditional forces such as class (Beck *et al.*, 1995; Beck and Beck-Gernsheim, 1996; Beck, 1992). The underlying assumption of the race subtext is that whiteness is the norm and superior (Acker, 2012). Race thus refers to socially defined differences and beliefs that define oppression and domination (Acker, 2006). Race intersects with class in that African-American women and men were confined to low-level jobs or completely excluded from paid employment (Acker, 2006). Class, gender, and race intersect in a multitude of ways in the labour market in that, for instance, care work is often done by migrant and racialised women (Ehrenreich and Hochschild, 2003; Gutiérrez-Rodríguez, 2014). Intersectionality thus allows the intersection of inequalities to be seen, which creates new perspectives on issues such as the future of work.

Although Acker has not reformulated the gender subtext as inequality subtexts, inequality subtexts explicate the underlying intersectionality of the notion. The term 'inequality subtexts' suggests that a deeper, hidden, and implicit meaning is available beyond written or spoken words, bringing implicit assumptions about the intersections of gender, race, and class to the fore that might otherwise remain unacknowledged. For instance, concepts of entrepreneurship contain gender and race subtexts, which shape how entrepreneurship is conceptualised and operationalised (Ogbor, 2000). The analysis of inequality subtexts could focus on elements similar to what Acker (2006) describes in relation to six interlocking components of inequality regimes. Like other research (Healy, Bradley and Forson, 2011; Healy *et al.*, 2019; Davies, Yarrow and Syed, 2020), this research will focus on selected components: first, the 'bases of inequality' as gender, class, and race; second, patterns of segregation with regard to the degree and shape of inequality, such as who is expected to hold which types of jobs; third, how images of the ideal worker structure organising processes of the future; and fourth, what awareness exists around inequalities. The analysis will not include the remaining two elements: how inequalities are legitimised, and mechanisms of compliance and control.

Inequality regimes and thus inequality subtexts can change, for instance owing to globalisation and technological changes (Acker, 2006). Acker (2006) suggests that while globalisation has threatened white men's advantages, white men still end up in the most advantaged positions. If new technologies are used for instance in organising processes that reproduce inequality for example in recruitment and hiring, then gender and race partially define who is seen as suitable and competent for a role (Acker, 2006). With the use of AI in the hiring process increasing (Eubanks, 2018; Tippins, Oswald and McPhail, 2021), it has been shown that inequality around gender and race are amplified through the use of AI in hiring (Benjamin, 2019; Vassilopoulou *et al.*, 2022). The use of past data to predict future outcomes is leading to feedback loops that reinstate inequalities, such that those who are different are unlikely to succeed in recruitment processes (Gebru, 2020). The consideration of intersectionality with regard to AI is thus central (Buolamwini and Gebru, 2018) and includes a concern for who is excluded and included in the creation of AI for example among the programmers or data labellers (Gebru, 2020; Gray and Suri, 2019). New technologies in organisations thus need to be explored in relation to inequality subtexts.

While such inequality subtexts wield important analytical utility to shed light on the future of work, the concept of problematisation enables the construction of research questions based on such an analysis (Sandberg and Alvesson, 2011; Alvesson and Sandberg, 2011). While much management research uses gap-spotting as a technique to develop research questions, problematisation strategies 'deliberately try to identify and challenge the assumptions underlying existing literature in the process of constructing research questions' (Alvesson and Sandberg, 2011, p. 252). While the analysis of inequality subtexts is useful on its own, problematisation can make visible the underlying assumptions of a body of literature with the explicit aim of developing new research questions to advance theory development (Alvesson and Sandberg, 2011). Although problematisation applies to academic literature, it can equally well be used with regard to popular literature. For example, Boltanski and Chiapello's (2006) seminal analysis of popular management books not only has developed substantial theory in its own right but also has inspired other research, including in management (Alvesson and Willmott, 2012; Spicer, Alvesson and Kärreman, 2009). The analysis of inequality subtexts in popular books can

thus be used to develop a new research agenda through problematisation.

Analysing inequality subtexts is a particularly pressing issue with regard to literature that imagines the future of work in relation to technology, as constructions and silences around gender, race, and class are embedded in and perpetuated through such texts. The future of work has captured the imagination of the wider public and management practitioners alike; it is regularly picked up by consultancies (Manyika, Chui and Miremadi, 2017a; Hawksworth, Berriman and Goel, 2018) and international organisations (OECD, 2016; World Economic Forum, 2020; Balliester and Elsheikhi, 2018) that publish papers, reports, and books on the topic. The future-of-work literature, particularly published in book format, can be seen as its own genre (Adamson and Kelan, 2019). Books on this topic are a type of popular management writing that is widely consumed and which potentially shapes the popular imagination on the future of work. Yet, how this future is imagined has so far not been studied extensively in business and management (Howe, Hentrup and Menges, 2021; Gümüsay and Reinecke, 2022). With gender, race, and class in relation to technology seen as particularly important for the future of work (Balliester and Elsheikhi, 2018; Howe, Hentrup and Menges, 2021; Santana and Cobo, 2020), analysing inequality subtexts of the future of work is central to understanding how inequalities might emerge in imagined futures.

The automation/augmentation paradox dominates popular books on the future of work (Raisch and Krakowski, 2021). Automation means that technology replaces human labour. Tasks are completed by machines with no or minimal human involvement; such an approach is ideally suited for routine tasks (Raisch and Krakowski, 2021). In contrast, augmentation means that humans and machines collaborate on more complex tasks (Raisch and Krakowski, 2021). Although it is commonly presumed that the future of work will see either more augmentation or more automation, Raisch and Krakowski (2021) suggest that automation and augmentation are in a paradoxical relationship: they appear as contradictory yet are interdependent. They argue that a mix of automation and augmentation can be observed across time and space.

How inequality subtexts might influence the automation/augmentation debate in the future of work is less explored. Wajcman (2017) reviewed books on automation and the future of jobs, and suggested that portrayals of the future of work present dystopian rather than utopian perspectives. The books construct the current transformations as different from before because, this time, professional jobs are under threat of automation (Wajcman, 2017; see also Howcroft and Rubery, 2019). Yet, according to Wajcman, these books ignore the gendering of skills, which has been central in constructing the professions and other workplaces (Wajcman, 2017; see also Kelan, 2008a; Phillips and Taylor, 1980). Furthermore, emotional labour that is often performed by women tends to be ignored in scenarios of the future of work; for example, in the context of care work and around conceptualisations of presumed non-automatable social and emotional skills. Finally, technologies bear the imprint of their maker, and, in this case, many technologies are designed by white, male engineers (Wajcman, 2017, 2004, 1991). Far from a deterministic take on technology, this perspective suggests that technology is shaped by and shapes society (MacKenzie and Wajcman, 1999), and, as such, is gendered, raced, and classed (Benjamin, 2019; Faulkner, 2001; Buolamwini and Gebru, 2018; Kennedy, 2005). In order to consider the discussions and silences around automation and augmentation in the technology-driven future-of-work literature, this article therefore analyses inequality subtexts in popular books and then problematises the findings to develop new research questions.

Methodology and methods

This article identifies and problematises inequality subtexts in popular literature on the future of work in relation to automation and augmentation. The popular literature is constituted by a range of publication formats such as reports and books. Most reports either synthesise existing research or discuss primary research and include reports such as those by the Oxford Martin Programme (Frey and Osborne, 2013), the OECD (2016), and Accenture (Manyika, Chui and Miremadi, 2017a; Manyika *et al.*, 2017b). Books, in contrast, allow authors to expand more fully on the topic, and to include more anecdotes and examples, which can be expected to be particularly fruitful when analysing

inequality subtexts. This research therefore focuses on analysing popular books on the future of work.

Criteria for inclusion

The first step of the research was to identify potential books for inclusion. In order to identify popular books, the business press, including *The Wall Street Journal*, *The Economist*, *The New York Times* and the *Financial Times*, was searched for book reviews. In addition, Amazon's search and recommendation system was used, and physical bookstores were visited to check for other books shelved in the same section. New books by well-known writers on the future of work were sourced. Finally, direct book recommendations from the author's professional network were identified through individual email exchanges and an online survey.

In order to be included in the analysis, the books had to fulfil all of the following five criteria. First, the books should discuss the future of work with a particular focus on technology (digitalisation, machine learning, AI, automation, augmentation, and robotics). Second, the books should be popular books, rather than monographs addressed mainly to academics. Third, the books should be written in English. Fourth, the books should have been published between 2017 and 2020, a period that saw a proliferation of books on the future of work following the publication of *The Fourth Industrial Revolution* (Schwab, 2016) and *The Second Machine Age* (Brynjolfsson and McAfee, 2014). The end year of 2020 was selected because this was when the COVID-19 pandemic unfolded, which is expected to significantly shift how the future of work is imagined, such as around the ideas of the great resignation (De Smet *et al.*, 2021). Fifth, if authors had published more than one book, the more recent one was selected. Given the fact that the books were mainstream books, they did not have to focus specifically on gender, race, and class, and they did not have to be written by women or working-class or non-white authors.

Sampling

The initial sample consisted of six books that fulfilled all five criteria outlined above. Each book identified was read in its entirety once to establish a good understanding of the material. During the second reading, the focus shifted to analysing how the future of work was constructed in relation to gender, race, and class. This means that sections where topics such as what jobs are going to disappear and which are future-proof, and which skills are going to be required were extracted, alongside sections that talked about gender, class, and race, for instance in relation to blue-, white-, and pink-collar work and breadwinners. These passages were then coded line by line into initial codes (Charmaz, 2006) in NVivo. These initial codes were aggregated into focused codes (Charmaz, 2006) or first-order descriptive codes (van Maanen, 1979). During the analysis, particular attention was paid to identifying silences (Charmaz, 2021) to help articulate the underlying assumptions of inequality subtexts. The material was read and re-read, and codes evolved in the process. Through abstracting further from these first-order descriptive codes, second-order themes (van Maanen, 1979) were developed. These processes followed a back and forth between the material and the academic literature. These second-order themes are akin to axial coding, where the properties and dimensions of a category are specified (Charmaz, 2006). These second-order themes were further abstracted into aggregated dimensions.

Theoretical sampling was then employed to source further books that fulfilled the criteria and could elucidate the aggregated dimensions. Four additional books were analysed using the same process as outlined above, but this additional material did not create new theoretical insight, which was understood to demonstrate that the dimensions were theoretically saturated (Charmaz, 2006). This meant that 10 books were analysed that fulfilled the criteria, after which no new theoretical insight was gained. This is in line with but exceeds other studies that analysed between three and eight books (Kelan, 2008c; Adamson and Kelan, 2019; Raisch and Krakowski, 2021). Of the four books published in 2020, two did not reference COVID-19 because they went to print before the pandemic hit, and the final two referenced COVID-19 in a rather cursory fashion. Given that none of the selected books were authored by women, it is difficult to ascertain whether a woman author would make a difference to the text produced without resorting to essential notions of gender. A full list of the books analysed is available in Table 1. The material structure is presented in Table 2, which provides further detail on the coding and selected illustrative examples. These function as

Table 1. List of books

• Richard Baldwin (2019) *The Globotics Upheaval: Globalisation, Robotics and the Future of Work*.
• Aaron Benanav (2020) *Automation and the Future of Work*.
• David de Cremer (2020) *Leadership by Algorithm: Who Leads and Who Follows in the AI Era*.
• Paul Daugherty and H. James Wilson (2018) *Human+Machine: Reimagining Work in the Age of AI*.
• Carl Benedikt Frey (2019) *The Technology Trap: Capital, Labor, and Power in the Age of Automation*.
• Jamie Merisotis (2020) *Human Work in the Age of Smart Machines*.
• Andrew McAfee and Erik Brynjolfsson (2017) *Machine, Platform, Crowd: Harnessing Our Digital Future*.
• Klaus Schwab (2018) *Shaping the Future of the Fourth Industrial Revolution*.
• Daniel Susskind (2020) *A World Without Work: Technology, Automation and How We Should Respond*.
• Darell West (2018) *The Future of Work: Robots, AI, and Automation*.

'proof quotes' (Pratt, 2008), or in this case, proof examples. In the main text, the two underlying assumptions are presented and supported with the best illustration of the properties of the dimension in the form of 'power quotes' (Pratt, 2008) or power examples. The books are largely referred to by their authors' surnames to improve readability. The selection and analysis of the material is based on the author's own reading, and, as such, is subjective and constructed (Charmaz, 2021).

The subtexts of automation and augmentation

The analysed future-of-work books tend to construct dystopian or utopian futures (Wajcman, 2017). These books paint an alarming picture, where many of today's jobs are under threat of automation. Historical comparisons, particularly to the Industrial Revolution and associated backlashes, are common, but the books echo the sentiment that 'this time it is different' (Wajcman, 2017; Howcroft and Rubery, 2019), meaning that the scale and scope of job losses is concerning. This sense of urgency is substantiated by citing a range of 'smart experts' such as Bill Gates (Baldwin, Benanav and De Cremer), Elon Musk (Baldwin, Benanav and West), and Stephen Hawking (Baldwin, De Cremer, Frey) or the book *The Second Machine Age* (McAfee and Brynjolfsson, 2014) (Benanav, Frey, Schwab West, McAffee and Brynjolfsson). The books thus function as a stark warning that the future of work can be dystopian unless specific actions are taken, which the authors outline.

However, while these dystopian scenarios are used to argue that automation is threatening jobs, there is also a utopian perspective where humans and machines augment each other. Additionally, it is expected that humans have an advantage in those areas where machines are lacking, such as with regard to social and emotional skills. While the automation perspective is thus concerned with a threat to jobs, the augmentation perspective engages with areas where future jobs are likely to be found.

To analyse the automation/augmentation tension in relation to inequality subtexts in the future-of-work literature, this section is organised in two parts. First, automation is discussed by outlining the key findings from the literature while problematising the findings. The same process is then followed with regard to augmentation. Further evidence is provided in Table 2.

Automation anxiety – jobs under threat

The books share a concern that automation is putting a large number of jobs under threat, and men largely hold those jobs. Frey suggests that 'men have been twice as likely as women to find themselves replaced by robots' (2019: p. 243). Middle-aged men are often mentioned as being under threat of becoming unemployed, while younger women are seen as earning more than younger men (see Table 2: Men). It is also discussed how policies favour a traditional gender division of labour, where men are seen as the breadwinner in the household and women are seen as caregivers and supplemental earners, as Benanav (2020) argues. As such, the gender subtext focuses attention on men who are seen as the provider (Acker, 2012), but whose ability to fulfil this function is hampered by the economic transformation.

One could presume that individualisation makes class less relevant (Beck *et al.*, 1995; Beck and Beck-Gernsheim, 1996; Beck, 1992) and, as such, class might not be discussed in the books. However, white working-class individuals are discussed in relation to 'death of despair', and working-class

Table 2. Material structure

Aggregated dimensions	2nd order themes	1st order descriptive codes

Automation - Threat to jobs	Men	• Men at risk of redundancy (Frey, West, Susskind)
		  ◦ 'if the current trend continues, 24 percent of men aged 25–45 will be out of work by 2050' (Frey, 2019, p. 347) and '"men in their prime" without job' (Frey, 2019, p. 348f)
		  ◦ Within a generation, 25% of middle-aged men without jobs (West, 2018, p. 72)
		• Younger women do better economically than men
		  ◦ 'American women aged thirty or younger have higher earnings power than their male counterparts – with the exception of the three largest metropolitan areas, where skilled men have clustered' (Frey, 2019, p. 242)
		• Men's identities attached to work (Susskind)
		• Male breadwinner head of household (Benanav)
		  ◦ Mini-jobs in Germany are 'de facto reserved for housewives' (Benanav, 2020, p. 52)

	Blue- and pink-collar work	• White working-class people affected by 'death of despair' (Merisotis) • Working-class men are vulnerable to depression, anxiety, and reduced self-esteem due to job loss (Merisotis) • Men reluctant to do pink-collar work (Susskind) • Pink-collar work out of reach of machines (Susskind) • Growth of pink-collar work associated with office machination (Frey)

	White-collar, middle-class, and professional work	• Middle-class jobs no longer sheltered jobs (Baldwin)
		  ◦ 'Up till now, many of these "successful lives" were lived by people working in white-collar and professional jobs. And up till now, such jobs were sheltered from both globalization and robots. Globots are changing that reality' (Baldwin, 2019, p. 186)
		  ◦ 'Until recently, most service and professional jobs were sheltered from globalization by the need for face-to-face contact' (Baldwin, 2019, p. 2)
		• Education is central to middle-class jobs (Benanav, Frey, Susskind)
		• Technology is replacing professional jobs (Benanav)
		• Finance (Baldwin, De Cremer, Schwab)
		• Accounting (Frey, Schwab, Merisotis)
		• Law (Baldwin, de Cremer, Frey, Schwab, Susskind, West)
		  ◦ Legal work being automated by Lex Machina and Ravel Law (Baldwin)
		  ◦ Contesting parking tickets (De Cremer)
		  ◦ J.P. Morgan's automatic review system for commercial loan agreements, Allen & Overy's software that drafts standard derivatives transactions (Susskind)
		  ◦ AI-driven bankruptcy legal assistant (West)

Table 2. (Continued)

Aggregated dimensions	2nd order themes	1st order descriptive codes
Augmentation – Caring for humans and machines	Future-proof skills	General • Creativity (De Cremer, Merisotis, Schwab) • Teamwork (McAfee and Brynjolfsson) • Coaching (McAfee and Brynjolfsson) • Leadership (De Cremer, McAfee and Brynjolfsson) Social Skills • Social and interpersonal skills (Baldwin, Merisotis, McAfee and Brynjolfsson, Schwab) • Social intelligence (Baldwin, Susskind) • Emotional intelligence (De Cremer) • Empathy (De Cremer, Merisotis, McAfee, Baldwin) • People prefer to receive medical diagnoses from compassionate people rather than from machines (McAfee and Brynjolfsson) • 'No-collar' workforce that is trained in empathy might replace traditional blue-collar work (Daugherty and Wilson)
	Care work	• Women in care roles (Susskind, West) • Care work is undervalued (Susskind) • Care work taken over by machines (West)
	Future-proof jobs	• Teaching (Baldwin, Susskind) • Social work (Susskind) • Medicine (Frey) • Personal services (yoga and Zumba instructors, health and beach body coaches) (Susskind, West, McAfee and Brynjolfsson, Frey)
	Collaborating with and creating machines	• Jobs tending the human–machine interface (Baldwin, Daugherty and Wilson, De Cremer) • Blurring of white- and blue-collar work in areas such as training and using collaborative robotics (Daugherty and Wilson) • Machine-learning engineers, data scientists, and big data architects (Frey) • Programmers as trainers (Daugherty and Wilson) • Shortage of AI specialists (Baldwin) • Women absent from STEM subjects and few IT jobs held by women (Schwab) • Vehicle design anthropologist at Nissan, and a poet, novelist and playwright at Microsoft's Cortana (Daugherty and Wilson) • Crowd-sourced and outsourced AI work (Daugherty and Wilson) • 'AI training doesn't necessarily have to be done in-house. Like payroll, IT, and other functions, the training of AI systems can be crowdsourced or outsourced.' (Daugherty and Wilson, 2018, p. 120) • Humans are needed in the data supply chain to avoid bias creeping in, such as when AI was biased against black defenders in predictions about defendants' future criminal behaviour (Daugherty and Wilson) • AI-supported mannequins can identify customers by gender, age, and race to analyse and predict shopping habits (Daugherty and Wilson) • Unilever increased its diversity in hiring through use of video interviews (Daugherty and Wilson)

men are said to suffer depression, anxiety, and reduced self-esteem owing to job loss (Table 2: Blue- and Pink-Collar Work). Working-class men are also discussed in relation to their perceived unwillingness to change their identities. This idea reflects horizontal segregation of the workplace, where men do blue-collar work whereas women do pink-collar work. Susskind (2020) explains that men who lose blue-collar work are often reluctant to take on pink-collar work. He describes this as unfortunate, because many pink-collar jobs are understood as currently beyond the reach of machines. Susskind suggests that many 'male workers are attached to an identity that is rooted in a particular sort of role – its social status, the nature of the work, the type of people that tend to do it – and are willing to stay unemployed in order to protect that identity' (Susskind, 2020: p. 106). Susskind here discusses men who are displaced by technology in manufacturing, which is traditional blue-collar work, and how those men are willing to not have paid work at all rather than to go into jobs that are being held by women, for example pink-collar work in teaching, nursing or hairdressing (Susskind, 2020: p. 105). Although Susskind does not address race in this context, it can be expected that one could presume that these idealised holders of blue- and pink-collar jobs are white. With regard to patterns of segregation in respect of who is expected to hold which jobs (Acker, 2012), it is white working-class men who are singled out. Those working-class men are constructed as responsible for their own labour market position – they could take on pink-collar jobs but refuse to do that – which chimes with neoliberal assumptions (Acker, 2012), where individuals are expected to reinvent themselves (Gill and Orgad, 2018).

To problematise the idea of working-class men's inability for reinvention, it is useful to point to academic research, which has analysed the construction of white men's working-class identity constructions in the context of industrial change (Walker and Roberts, 2018; McDowell, 2003) on the one hand, and how women in a variety of class positions are encouraged to reinvent themselves under neoliberalism (Carr and Kelan, 2021; Adamson, 2017; Adamson and Kelan, 2019; Baker and Kelan, 2019) on the other. As such, there might be room to expand research that critically questions how far working-class men are encouraged to reinvent themselves in relation to

job automation. Such research could also draw on the theory of individualisation to question how far neoliberal reinvention discourses construct the future as an outcome of individual choices rather than as structural concerns when white working-class men are discussed.

Although books make reference to blue-collar work, the overarching concern is that good, middle-class, white-collar jobs will become redundant (Table 2: White-Collar, Middle-class, and Professional work). Baldwin (2019) talks about white-collar robots replacing traditional middle-class jobs because white-collar robots cost a fifth of a worker in industrialised economies and a third of a worker in less developed areas. White-collar robots may not take over entire occupations, but they will take over tasks, reducing the number of human white-collar workers needed.

The old assumption that a good education will secure a good middle-class job no longer seems to hold (Benanav). Frey (2019) sets this in the context of the second Industrial Revolution, which resulted in an opportunity cost reduction of education owing to demands for higher-level skills, so that 'office workers, including bookkeepers, clerks, and managers, found themselves handsomely paid for their education' (p. 215). However, in the current transformation, a good education is no longer a guaranteed pathway to attaining or sustaining a middle-class lifestyle. A central concern of future-of-work writers is that securing a prosperous future by investing in educational credentials no longer applies.

The idea that middle-class jobs appear under threat should be problematised. Ehrenreich (1989) documented how the middle classes fear leaving their class status behind owing to economic change. Autor (2015) observes that for the last two centuries, middle-class jobs have been considered to be threatened by automation, yet they are often more secure than other areas of work. Other research has shown that machine learning increases the requirement for highly skilled work and decreases that for low-skilled work (Balsmeier and Woerter, 2019). However, the underlying assumption of the middle-class job under threat is not only that class status can be secured through education but also that this class status is intertwined with a bourgeois model of work where middle-class men can provide for their families through their stable jobs. This breadwinner ideal is gendered masculine (Kelan, 2008b) and bound up with bourgeois

and managerial masculinity (Connell and Wood, 2005) and is, as such, classed. The underlying assumption also presumes a stable nuclear family; however this stable nuclear familiy has been reconfigured by changes in lifestyles, such as co-habitation without marriage, divorce, and single parenthood (Beck-Gernsheim, 2002). In relation to the workplace, these dynamics have been analysed in relation to dual-career couples (Petriglieri, 2019; Petriglieri and Obodaru, 2019), single mothers (Radcliffe *et al.*, 2022), and female bread-winners (Drago, Black and Wooden, 2005), and are particularly relevant in the context of black women heading households (Carby, 1982). Rather than presuming a traditional nuclear family with a primary breadwinner and primary caregiver, it is necessary to analyse how a greater variety of existing work/family arrangements interact with the perceived threat to middle-class work.

The professions, as quintessential middle-class jobs, are repeatedly singled out as under threat (Table 2: White-collar, middle-class, and professional work). Schwab (2018) suggests that 'new forms of automation, including robots and algorithms driving recent advances in AI, are not just replacing factory workers but increasingly, accountants, lawyers and other professional workers' (p. 61). Although jobs in finance and accounting are regularly mentioned, lawyers are indeed the group of professionals that attract most attention in the books analysed. Baldwin summarises the changes as follows:

> Consider an example of how globots changed the meaning of success in the law profession. Until recently, a law degree and a can-do attitude was a ticket to middle-class prosperity. Now, junior lawyers are competing with white-collar robots; those who can leverage the new tech may thrive, but those who can't will have to find something else to do. (Baldwin, 2019: p. 269)

Globots combine robotics and globalization, and although it is not spelled out, the underlying assumption is that it is white, middle-class men who will be impacted by the change in the professions. The assumption could be problematised with regard to whether white men still end up on top (Acker, 2006). Furthermore, professional services work is often described as lacking gender, race, and class diversity, and these jobs are changing just at a time when organisations are trying to address these inequalities (Kornberger,

Carter and Ross-Smith, 2010). Existing research has largely focused on how white, middle-class women make inroads into professional jobs and has often stressed that the incompatibility of caring responsibilities with the demands of these professional jobs make them challenging for women (Ashley, 2010; Ely, 1994; Kokot-Blamey, 2021; Kornberger, Carter and Ross-Smith, 2010; Kornberger, Carter and Ross-Smith, 2010; Lupu, 2012; Walsh, 2012). This raises the question of how working-class and/or black women are faring in professional work just when these jobs are changing. It has been shown that women might seek to leave traditional law firms and engage in platform work instead (Howcroft, Mumford and Bergvall-Kåreborn, 2021). This risks reproducing inequality regimes, because the gig economy and platform work have been seen as a way to deteriorate job quality while increasing algorithmic control (Bucher, Schou and Waldkirch, 2021; Duggan *et al.*, 2020; Newlands, 2021; Wood *et al.*, 2019). The focus on white, middle-class men also distracts attention from researching marginalised groups (Cave, 2020; Wajcman, 2017).

Augmentation aspiration – future skills

Although automation is presumed to put jobs under threat, the books also describe human skills that augment machines and are considered future-proof. Skills that are said to be future-proof are those that are seen as difficult for machines to accomplish. These future skills largely relate to caring for humans or machines.

Humans are constructed as being irreplaceable for tasks that require social and emotional skills, which authors describe in slightly different terms (Table 2: Future Proof-Skills). Susskind (2020) states that 'new technologies struggle to perform tasks that require social intelligence: activities that require face-to-face interaction or empathic support' (p. 77). Merisotis (2020) cites Anne-Marie Slaughter, saying that '"In the industrial economy, we hired hands. In the knowledge economy, we hired heads. In the human economy, we will hire hearts"' (p. 107). Consequently, many jobs entailing social and emotional skills are seen as safe from automation.

How these social skills are gendered, raced, and classed remains, however, rarely addressed, and, instead, these skills appear as open to all. This underlying assumption has to be problematised.

One of the few instances when social skills are discussed in relation to class is in relation to how blue-collar workers are replaced by 'no-collar' workers who have been trained in empathy (Daugherty and Wilson, 2018). Whereas white- and blue-collar work denotes middle-class and working-class backgrounds, respectively, and pink-collar is associated with clerical work performed by women, the idea of no-collar seems to suggest that people from all classes and genders can perform such work. Empathy thus appears as dissolving traditional class and gender structures, but it also seen as something that is not innate but that can be trained. Earlier research has shown that women were presumed to possess social and emotional skills, but those skills are not rewarded in women (Fletcher, 1999; Kelan, 2008a; Phillips and Taylor, 1980). Moreover, it can be expected that inequality regimes will be present in that context. For instance, how black women are evaluated with regard to social skills is likely to be different from how black men's social skills are perceived.

One area that is clearly gendered in relation to social skills is in relation to care work. It is mentioned in the books that care work is under-valued and often performed by women (Table 2: Care Work). As such, some books make reference to gender segregation, but in problematising this idea, it should be noted that the books are less explicit in discussing that paid care work is often done by migrant and racialised women (Ehren-reich and Hochschild, 2003; Gutiérrez-Rodríguez, 2014; Kanna, Renard and Vora, 2020; Vaittinen, 2014). The race subtext and to some extent the class subtext are ignored in discussions around care. Similarly, the unpaid care work that women perform at home is not discussed in great detail, indicating that what is defined as work is largely paid work (Gutiérrez-Rodríguez, 2014).

Although most authors consider care work to be future-proof, West (2018) casts some doubt over whether such jobs will be protected from techno-logical change:

> Women (and some men) have entered positions that focus on caregiving. With the ageing population and the shift of jobs toward health care, that would appear to insulate people employed in those areas from technological change. Yet digital technology is changing caregiving. (West, 2018, p. 78)

As such, research should ask how digitalisation is changing caregiving and how the interplay be-tween emerging technologies and caregiving is af-fecting inequality regimes around gender, race, and class.

It should also be noted that care work is broadly understood in the texts. Care work includes teach-ing, social work, medicine, and a range of personal services, such as yoga and Zumba instructors, and health and beach body coaches (Table 2: Future-Proof Jobs). With regard to teaching, it has, for in-stance, been shown that in the United States, black and Latina women are often performing care work as paraprofessionals, while teaching roles are asso-ciated with white women, which creates inequal-ity regimes (Quinn and Ferree, 2019). It has also been shown that in social work, men often assume dominant positions and thus reproduce inequal-ity regimes (Dahlkild-Öhman and Eriksson, 2013). Research has shown how inequalities are repro-duced in social media work (Carr and Kelan, 2021; Duffy, 2015; Locatelli, 2020), and such findings could be used to understand inequality regimes that affect such personal services.

Another presumed growth area is tending the human–machine interface. This work involves those who, for instance, work with robots in fac-tories (Table 2: Collaborating with and creating machines). This new emerging work is constructed as blurring blue- and white-collar jobs (Daugh-erty and Wilson); traditional factory work is blue-collar work, but the education required to work with robots in a factory is akin to that required for white-collar work. As such, the class back-ground of those who perform this work is increas-ingly blurred, possibly feeding into the idea of no-collar workforces discussed above. However, it can be expected that there are certain types of people who are expected to perform these jobs who will be uniquely positioned with regard to gender, race, and class.

The production of AI itself reflects and shapes inequalities. While the centrality of AI special-ists is often referenced, only one book mentions the scarcity of women in the ranks of in-demand, high-end AI workers:

> Women account for fewer than 30% of those em-ployed in scientific research, with an even smaller representation in STEM fields. Less than 25% of IT jobs are held by women, and the proportion is even lower among tech entrepreneurs… More specif-ically, it leaves millions of good ideas and input out of the conversation, holding back much-needed

knowledge production…Unleashing women's potential in the Fourth Industrial Revolution is unleashing society's potential. (Schwab, 2018: p. 63)

Here, Schwab argues that women's underrepresentation in science and technology limits knowledge production. While the gender segregation of such work is widely researched, this can be problematised by pointing out that inequalities extend beyond gender, in that the high-skilled AI labour force is not only relatively young but also predominantly white (Simonite, 2018; Wajcman, 1991, 2004, 2018). Furthermore, women are not only underrepresented in data science (Simonite, 2018) but, in this field, women are also in lower-status roles and receive less pay (Young, Wajcman and Sprejer, 2021). This replicates gender segregation and men's dominance in being associated with technologies (Acker, 2012; Faulkner, 2000, 2001). Data on intersectionality in data science is missing (Young, Wajcman and Sprejer, 2021), but the intersectional analysis presented in the book *Geek Girls* (Twine, 2022) provides inspiration for how such a study might look.

While most books focus on high-end AI specialists, one book recognises that those who train AI often perform this labour under outsourced and crowd-sourced conditions:

One such third-party crowd-sourcer called Mighty AI ingeniously uses crowdsourcing techniques to help train systems in vision recognition (for example, identifying lakes, mountains, and roads from photographs) and natural-language processing. (Daugherty and Wilson, 2018: p. 120)

Thus, there is a hidden AI workforce, such as data labellers or annotators, who develop and improve AI. Gray and Suri (2019) have called this type of work 'ghost work' because it is hidden from sight and the assumption is that the work is done by machines. Rather, this work is performed by humans on digital platforms such as Amazon's Mechanical Turk (MTurk), who are paid by task completed (Casilli and Posada, 2019). Such micro-work has been researched in relation to race (Casilli and Posada, 2019; Gray and Suri, 2019), but research into how women in the Global South perform this work (Murgia, 2019) would be meaningful to understand inequality regimes in the production of AI.

Daugherty and Wilson (2018) also talk about algorithmic bias, for instance in relation to race, where they mention AI being biased against black defenders when predicting future criminal behaviour. Daugherty and Wilson (2018) also mention how AI-supported mannequins in retail are used to identify customers by gender, age, and race to predict shopping habits. However, such approaches might be prone to misidentification. If the underlying data for AI is not representative, this can for instance lead to the phenomenon that, in facial recognition, black women are less well recognised than white men (Buolamwini and Gebru, 2018). Similarly, Daugherty and Wilson (2018) mention that Unilever increased diversity through using pre-recorded video interviews. Yet, there is a risk that if language is analysed as part of a pre-recorded video interview, then accents or gender- and race-related language patterns might influence the ranking of candidates (Tippins, Oswald and McPhail, 2021). As such, the data used for AI, and how gender, race and class are reflected in it, needs to be central in discussios about addressing inequalities (Gebru, 2020).

The inclusiveness of AI design is also central (Gebru, 2020). It has been shown that preconceived ideas that designers hold shape the design of products (Hofmann, 1999; Rommes, Oost and Oudshoorn, 2001). Conceptions of women as helpful have contributed to the fact that most voice assistants had a default female voice, which means that gender is encoded into technology (Equals and UNESCO, 2019; Strengers and Kennedy, 2020; Wagman and Parks, 2021). Gebru thus asks, 'If the tech industry were not dominated by cis-gendered straight men, would we have developed automatic gender recognition tools that have been shown to harm transgender communities and encourage stereotypical gender roles?' (Gebru, 2020, p. 10). As such, how gender, class, and race are conceptualised by designers is central, and this also extends to those data annotators that are often hidden from sight. Data labellers make subjective decisions in the data-labelling process, for instance when they label data based on gender or race (Kazimzade and Miceli, 2020). Research has outlined the limited classifications available amongst which the data labellers can choose and how this influences how AI 'sees' gender and race (Scheuerman, Paul and Brubaker, 2019; Scheuerman *et al.*, 2020; Tomasev *et al.*, 2021). In AI design, race, class, and gender intersect in multiple ways, yet these inequality subtexts are

obscured by how the future of work is currently discussed.

Discussion and conclusion

The paper problematised inequality subtexts in the technology-focused future-of-work literature to identify further research directions. Acker's (2012) gender subtext was expanded via the concept of inequality regimes to inequality subtexts to explicitly encompass gender, class, and race (Acker, 2006), which constitutes the first contribution of this paper. The concept of inequality subtexts was then applied to the contemporary future-of-work literature. Following earlier research that used popular management books to analyse changes in the world of work (Boltanski and Chiapello, 2006), this article used problematisation (Alvesson and Sandberg, 2011) with regard to popular management books to develop research directions.

The future-of-work literature echoed the automation/augmentation paradox, in that jobs were described both as under threat by automation and as future-proof through augmentation (Raisch and Krakowski, 2021). Thereby, the paper has enriched the general management literature by adding a further facet to how automation and augmentation are conceptualised in the future-of-work literature. It was shown how inequality subtexts feature in the automation/augmentation debate. The paper contributes an understanding of how automation anxiety focuses attention on jobs commonly held by men. It was shown how inequality subtexts focus attention on men, both in white- and in blue-collar professions, and away from other groups such as working-class women or black women, whose employment prospects might be changed owing to the emerging future of work. The third contribution of the paper is to show that automation aspirations are attached to jobs that only humans can do. Skills that only humans can do relate to social and emotional skills and to developing new technologies. However, how gender, class, and race affect the evaluation of social and emotional skills and the design of new technologies is obscured.

Based on these findings, it is possible to outline the contours of an emerging research agenda that could tackle those issues that are currently not critically discussed. In general, the paper has

highlighted that management researchers need to pay attention to inequalities when researching the future of work. Little is known of how inequality regimes interact with transformations of the workplace. As such, it is necessary to critically question how far men are indeed at risk of job losses, and, if they are, what kinds of men are. For instance, black men might face challenges that differ from those of working-class white men. Similarly, it is unclear how middle-class women working in white-collar jobs are affected by those transitions and how working-class and/or black women struggle to enter those workplaces in the first place. If family is discussed in the literature on white-collar work, it is largely under the presumption of a nuclear family, and research is needed to show how, for instance, single mothers fare in professional services work. It could be expected that the 'gigification' of white-collar work will affect individuals differently, depending on which inequality regimes are in operation, and detailed research should analyse this.

With regard to future-orientated skills, management research should further explore what these skills are and how they manifest in workplaces. For instance, are white men going to be able to claim those social and emotional skills and be rewarded for them, as earlier research has shown (Kelan, 2008a; Fletcher, 1999)? Research should also extend to ask how the ability to embody the social and emotional skills associated with women differs for white, Asian or black women. Social and emotional skills associated with care are often performed by migrant women (Ehrenreich and Hochschild, 2003; Gutiérrez-Rodríguez, 2014), which raises further questions of how such skills replicate inequality regimes. Research could also be conducted regarding whether social and emotional skills are in themselves expressions of certain upper-, middle-, or working-class cultures, which would make it easier or more difficult for individuals to embody such skills. In addition, how are skills associated with personal services reproducing inequality regimes? For instance, how are inequalities with regard to class, race, and gender reproduced or challenged in the work of fitness instructors or social media influencers, where the ability to build a brand will be reliant on having the appropriate cultural and financial resources.

Management research should look beyond the adoption of technology and also explore how

those technologies are created. While there is a growing body of work that focuses on the lack of women in data science, research on how inequality regimes might operate in this line of work currently does not exist (Young, Wajcman and Sprejer, 2021). Research thus needs to look beyond how gender segregation is manifested in data science (Young, Wajcman and Sprejer, 2021) and has to offer more intersectional analyses of those who are present or excluded from such work (Twine, 2022; Gebru, 2020). Detailed ethnographic studies of how AI is influenced by the lack of diversity among those who program it is required to highlight how gender, race, and class matter in the design process in order to avoid certain groups being disadvantaged by these emerging technologies (Gebru, 2020). Such research must also engage with data labellers, who are often women from lower social classes in the Global South (Murgia, 2019). Yet, how their work contributes to the development of AI is largely unexplored. In general, the background of those who label data is meaningful for the subjective decisions that are being made in data labelling, but specific studies of how such backgrounds matter in decision making and what this means for inequality regimes are not currently available. Furthermore, it is currently not known what the consequences of narrow conceptualisations of gender and race in data labelling are for research (Scheuerman, Paul and Brubaker, 2019; Scheuerman *et al.*, 2020; Tomasev *et al.*, 2021).

In terms of practical implications, the audience for the future-of-work books analysed are managers, policymakers, and the general public. This paper encourages this intended audience to engage critically with such texts. Furthermore the paper can inspire managers and policymakers to develop strategies and policies that address complex inequalities in the workplace from how they engage with suppliers, for instance through data labelling, to how working-from-home policies might affect employees differently.

One central feature of the future-of-work literature is that the futures imagined might unfold in ways not anticipated in the books. This means that the literature is constantly changing and adapting. A particularly drastic change to the future of work is provided by the COVID-19 pandemic and the emerging inequality regimes this has produced. Also relevant is the analysis of other sources that shape thinking on the future of work. While this paper focused on books, research could look at reports or newspapers that discuss the future of work and at how those reports are picked up. Alternatively, an analysis of how the wider popular media constructs inequalities in the future of work would be fruitful. It would also be interesting to explore how those consuming this literature, such as managers and policymakers, make sense of it. As this paper has demonstrated, the current future-of-work literature does not show more complex forms of inequality regimes relating to gender, class, and race, which opens the opportunity to develop new avenues that could inform this literature. This paper has thus argued that inequality subtexts of the future of work can be problematised to develop new research directions that show how inequalities are produced and how they might be reduced.

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