

PART IV

Conclusions and implications: job autonomy torn back and forth

18. Job autonomy as descriptor of change

This thesis reveals that service workers have a deep desire for job autonomy. The extent to which they are granted this autonomy is another question, the answer to which depends on the corporate strategy for realizing the potential of labor power and specific work content in the branches. ADM systems show different levels of intervention in the work processes of service workers (assisting, augmenting, automating) and may be utilized to fulfill different corporate strategies, mostly in a specific relationship between control and optimization. Employees themselves want to retain control over their work as much as possible. Using ADM systems does not fundamentally contradict this aspiration.

Has the deployment of ADM fundamentally changed work in the service sector? Is it the disruptive change that is predicted and expected for the world of work? With respect to the scope of this thesis, i.e., the extent to which using ADM systems influences the job autonomy of service employees, the answer must be no, not for the branches and tasks under consideration. This is because the systems are embedded in the existing structures of companies and work organizations, and, in many areas, learning ADM systems only intervene selectively in work processes.

The initial objective of this thesis was to gain insight into the effects of ADM on service activities. The answer to the core research question, namely, what influence ADM systems have on job autonomy for service sector employees, is, in short, a predominantly positive one. The extended question about the conditions and effects of this changed job autonomy directly involves the organizational embedding of the ADM system. A technical system does not serve the purpose of control, monitoring, support, or relief if it is not intended and embedded to do so.

The following concluding chapters reflect on the key findings of this thesis and attempt to transfer the empirical results to the service sector. First, a retrospective review is provided of specific expressions of job autonomy in the service sector, which shows a clear divide in terms of low and high autonomy values but also selective alignments (Chap. 18.1). The different levels of intervention of ADM systems in work processes are then summarized (Chap. 18.2) to highlight the special features regarding the interplay of learning ADM and job autonomy (Chap. 18.3). This distinction is intended to take account of the technical and organizational complexity of embedding ADM systems in work processes. Chap. 19 refers to these findings and supplements the consideration of specific corporate utilization strategies behind the use of ADM systems. Finally, this thesis concludes with a brief outlook and areas for action (Chap. 20).

18.1. Less and highly autonomous services: distinct yet converging

The structured quantification of all autonomy dimensions (Part II) lays the foundation for validating the basic theoretical assumptions of this work, which assume a fundamental division into less autonomous services (LAS) and highly autonomous services (HAS). The impression of a quite different job autonomy ratio between the two groups is initially confirmed in the context of the empirical analyses: LAS such as retail, logistics, accommodation and food services, or healthcare and social services show below-average job autonomy values. In contrast, HAS typically have higher average values than the service sector as a whole. The separation of the two groups is therefore empirically justified.

However, there are notable exceptions and peculiarities to this relationship. It is worth emphasizing that Criteria Autonomy not only shows mixed results for the service sector but that the differences between individual service branches are not as pronounced as might be expected. This suggests that the ability to set one's own work goals or to influence their evaluation across branch boundaries is considerably influenced by the respective control and optimization practices. Most service employees work under high pressure to perform, sometimes to their limits. The few exceptions in this sense are, for example, public administration and real estate, but also, surprisingly, wholesale and retail trade. Although other dimensions of autonomy show significant cuts, at least the pressure on employees to perform does not appear to be as pronounced as in other service branches.

What holds equally interesting implications is that Interactional Autonomy, as the component of job autonomy that has so far received little attention in other studies, is extremely homogeneous for the entire service sector. Service employees in Germany therefore not only support each other in a similar way but also have a comparable relationship of responsibility and dependency to others in their own work. Again, it is the interaction work that unites service work in its entirety. Apparently, service employees have established similar coping mechanisms with this interaction work, which allows them to work with a relatively high degree of freedom compared to other dimensions of autonomy. The view of education as well as healthcare and social services, however, reveals a sobering picture. High workloads and the most demanding interaction work are apparently also reflected in greater dependencies on the success of their work. It is particularly worrying that these two branches fall

so far behind other service branches, as the results point to particularly conflict-ridden and demanding interaction work.

These findings suggest that Interactional Autonomy eludes the development logic of the other job autonomy dimensions, i.e., LAS and HAS. It can be assumed that the other job autonomy dimensions develop along the lines of the control logics described, i.e., their access does not yet include interactional components of work. Employees with a particularly high potential for working with ADM systems, i.e., ADM knowledge, are largely in line with these findings. They are clearly among the top performers and HAS. Remarkably, however, they are even below the averages of the entire service sector for Criteria and Interactional Autonomy. Although no causality can be assumed, there are clear indications of a parallel occurrence of ADM skills and performance pressure, output control, and conflictual interactions.

Accounting for the changes in job autonomy since 2012, i.e., a period in which a considerable surge in digitalization is assumed, it is necessary to speak of solidified polarizations between LAS and HAS – but only regarding certain job autonomy dimensions. The highly autonomous branches are increasingly setting themselves apart from their counterparts, particularly in aspects relating to working hours and scheduling. This ties in with the marketization and flexibilization narratives of this group of employees: self-control and corporate target orientation.

What development gives reasons for reflection, however, are Task and Method Autonomy, i.e., the dimensions of job autonomy, which centrally concern work tasks, work quantity, task composition, and task execution. The boundaries between LAS and HAS are dissolving, as all have lost degrees of autonomy. In the less autonomous segments, the question arises as to where exactly new restrictions are being imposed, while in the highly autonomous areas, this development contradicts the existing logic of labor control and utilization. Overall, this suggests that the actual execution of work is more standardized and predetermined – possibly due to the use of ADM, which also has access to highly qualified occupations. Both trends towards devaluation and a stagnation of innovative work behavior can be formulated as consequences of these developments. However, the possibility that lower degrees of autonomy may even have a positive effect on certain groups cannot be ruled out; after all, excessive demands on self-organization and self-control can also lead to delimitation and the dissolution of boundaries.

In summary, it is important to note that the empirical analyses (especially in Part II) indicate that the service sector is characterized by significant restrictions overall. Statistically speaking, maximum values in job

autonomy could never be assumed, but the overall index values are still well below the possibilities of self-determined or at least co-determinable levels. The corresponding control logics can be easily traced based on the distinction between LAS (direct control, Taylorism, industrialization of services) and HAS (indirect control, self-optimization, internalization of the market). Comparability is established regarding performance requirements and output expectations (Criteria Autonomy) because both are controlled in this respect. Similarly, most branches resemble each other in terms of a balanced degree of Interactional Autonomy, which overall still tends to indicate self-determined interaction with clients.

18.2. Assisting, augmenting, automating ... liberating?

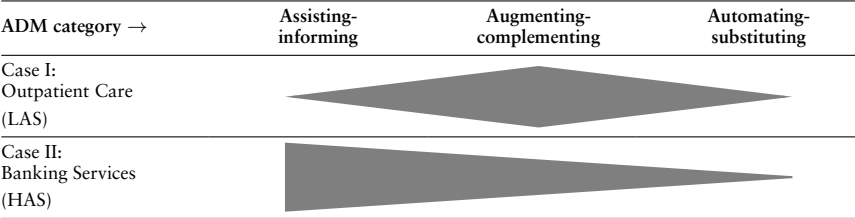
ADM systems come in a wide variety of shapes and functional scopes for companies: purely software-based and with physical components, integrated into existing systems, or part of newly set-up, networked solutions. Digital and rule-based systems are sometimes difficult to separate, and the learning components are not always clearly identifiable as such for users, as this learned output does not necessarily have to be extraordinarily complex. What unites the systems under consideration is that the various components have a broad spectrum of direct or indirect influences on the work of service employees, from assisting and augmenting to automating individual tasks.

In the two company case studies, the interplay between the depth of intervention of ADM systems in work processes and the degree of job autonomy in the branch showed what is possibly transferable to the entire service sector: LAS use ADM systems with a greater depth of intervention in service work than HAS (Figure 17). In most HAS, by contrast, the degree of digitalization is much higher than in the former, so the possibilities for the supplementary use of technology probably need to be carefully weighed up.

What should not be concluded from the above is that LAS are simply easier to automate than HAS. In both company examples, the limits of automation close to the interaction work with clients became apparent, and it is not foreseeable that, even if technically possible in parts, there will be a complete strategic move away from personal interaction work. Finally, there is still a connection between personal work with clients and the quality and individualization of services.

However, what is outlined in terms of taking over and supporting decision-making is that in the case of LAS, there may be more intervention in the decision-making process, meaning that employees must engage

Figure 17: ADM categorization by company case studies



more frequently and more deeply in negotiation processes between the machine and their own decisions. This development can be interpreted as supportive if the employees (as in the example of outpatient care) retain the authority to interpret final decisions about their work themselves.

However, should they lose this sovereignty, for example, through increased monitoring of compliance with ADM outputs, not only are massive reductions in job autonomy to be expected, but also corresponding coping mechanisms that may circumvent the ADM system through appropriation processes. In the case of HAS, by contrast, there appears to be less intervention in the decision-making practices of employees, in line with the underlying logic of self-control and optimization. Of course, there are also examples in which more complex decision-making situations are influenced. In the case of HAS, the problem lies more in the extent to which conflicts arise with the autonomy-depleting marketization mechanisms that arise from the use of ADM.

Abstracting from the case studies, a range of different effects involving the various ADM categories on work have emerged: The special feature of *assisting-informing* ADM lies in its basic information-providing character as an option. These systems are designed to process information and make it available on request. They are therefore reactive and do not actively intervene in work processes. They do not fundamentally change the form and content of work processes; they structure, centralize, and prepare information (e.g., the functions of working time and service recording in outpatient care or recommendations of unknown clients in banking services). This enables greater task variability, i.e., an information-driven expansion of the basis for decision-making, which allows tasks to be carried out more quickly and possibly more precisely. The selection and compilation of one's own task portfolio is supported based on the higher level of information. In this way, a greater density of information helps to accomplish work tasks and reduces the workload to a certain extent, especially if search processes are minimized.

Regarding the possible influence on the time and location components of job autonomy, new degrees of freedom can be created through more efficient work execution. With a high quality of information and its provision in sufficient quantity, both faster and less disruption-prone work are feasible. The informative character of these systems can influence Working Time and Locational Autonomy, in which the locally bound nature of information is partially resolved. However, the core of interaction work remains tied to specific locations, particularly in the case of LAS.

In terms of Interactional Autonomy, it has been proven that the individual employee can act more independently of team structures or other third parties due to the better quality of information provided by the ADM system. In cases of doubt, information no longer must be requested from other parties but can be obtained according to need and situation. This allows for concentration on the cooperative elements of work that are necessary for productive interaction.

The deployment of *augmenting-complementing* ADM systems can have ambivalent consequences for various dimensions of employees' job autonomy. Regarding Task Autonomy, it is evident that some routine tasks that require little autonomous decision-making are taken over by these systems, freeing up space for other, possibly more complex tasks. Whether this feature of the system is advantageous for the autonomy of employees depends very much on whether they really want to be relieved of these tasks or not, or to what extent they can retain the final decision-making authority for themselves. It is likely that some employees perceive the relief from certain simple decision-making tasks as a relief and, in a certain sense, as a strengthening of their job autonomy, while others feel deprived of their task variability and methodical freedom. The effect of changing Task Autonomy therefore depends on the extent to which the use of the system is tied to constraints or is available as an optional support tool. The use of augmenting-complementing ADM systems is a question of power and its negotiation between employees and the technical systems and thus employers – and the associated heterogeneous interests of both sides.

In augmenting-complementing ADM systems, the danger of new boundaries being drawn between workers and machines seems to be the most tangible. If ADM systems are to act in a complementary manner when performing a work task, this can quickly lead to real or perceived unwanted interference in workers' task spectrum. At what points in the work process should the technical system decide, suggest, or stay out completely? This form of demarcation, in turn, has the greatest influence on the autonomy of tasks and methods. If the system provides an alter-

native solution depending on the situation, the paths and approaches to the work objective are not predetermined but are decided based on a negotiation and coordination process between technical and non-technical elements, i.e., between workers and machines. Employees retain the right to “the last word” but must continue to bear sole responsibility for the decisions made and thus the work result (Criteria Autonomy), even though there are interventions in the individual’s own work process.

The considerations on the influences of augmenting-complementing ADM systems on the above-mentioned dimensions of job autonomy illustrate how much their positive or negative relationship can depend on the design and embedding in the work context, the application goals of the technologies, and the individual demands of the employees. Even if one assumes that the aim of the deployment (on the part of the employer) is to support employees in their decisions and to disregard the possible monitoring functions of the systems, a field of tension arises between undesirable interference in one’s own work and desired reinforcement of one’s own actions.

The *automating-substituting* elements of ADM contribute to strengthening job autonomy, as the two company case studies made clear. The decisive factor is which tasks are performed. If they are planning, administrative, or routine tasks, employees experience a new sense of freedom resulting from their omission. If they were tasks that interfered with work with clients, the outcome of this assessment might be different. The same applies to technical faults and incorrect output, which can quickly turn positive autonomy moments for service employees into negative ones. In both cases observed, the automating character of the respective ADM is perceived positively, as it creates scope for work that requires more complex, creative, and social thinking. This freedom can be expressed in terms of time and the cognitive focus being placed on more demanding tasks.

Regarding the adoption of decisions and the decision-making process, the use of such automated ADM does not lead to a perceived reduction in task variability or the ability to select precise work steps. Although decisions and recommendations in predefined situations are made entirely without workers’ intervention, it can be assumed that job autonomy increases if, as in the present cases, the final situational authority over their transfer to the core tasks in the service is retained.

Technical hurdles and possible erroneous outputs from the highly automated functions of the ADM systems are particularly problematic. If these are known and occur regularly, employees are in a constant state of activation, as the time, location, and content of the fault cannot be predicted. Positive elements of job autonomy that are triggered by au-

tomation are thus nullified. One could even go as far as to speak of employees being overburdened if the need to react to disruptions and identify them in the first place is a permanent necessity.

What remains regarding the effect of automating-substituting ADM in services is the fundamentally beneficial and positive perception by employees, who certainly feel relieved and liberated – if the automating functions of the systems are limited to clearly defined tasks in the planning and administrative areas beyond interaction work. Overall, the effect of using ADM systems on the job autonomy of service employees is less dependent on the intervention depth of the systems in work processes. The assisting and automating elements of the systems are clearly permeated by experiences of liberating job autonomy. The use of augmenting ADM is more conflictual because a constant negotiation process between the tasks of the ADM system and workers must be conducted at the level of job autonomy.

18.3. The distinctive features of learning ADM

Both digital systems and rule-based ADM, as well as learning ADM, are capable of generating positive job autonomy experiences for employees. In the empirical examples, these positive influences on job autonomy outnumber the few negative impacts by far (Table 13), and the latter depend largely on the underlying corporate utilization strategy of the respective systems. The effects described are based on the experiences of employees in the two case study companies but also allow for further conclusions to be drawn.

What is fundamentally evident is that digital and rule-based systems have almost exclusively positive effects on the job autonomy of service employees due to their high degree of maturity and increasing accuracy. These effects become tangible if they do not interfere with the execution of the interaction work and the controlling mechanisms that are undoubtedly inherent in them are absent. In contrast, learning ADM succeeds in bringing about improvements in areas of work to which rule-based systems previously had less access. This refers in particular to the expansion of options for action, in some cases, individualization, and thus also improvements in the quality of services and the creation of new temporal freedoms. However, it is becoming increasingly apparent that learning ADM, at least in its current applied status, can lead to more contradictions at work.

Table 13: Effects of rule-based and learning ADM on job autonomy dimensions

Autonomy Dimensions	Digitality/rule-based ADM	Learning ADM
Task Autonomy	+ Information access and standardization + Transparency and holism of information + Support with selection of tasks	+ Less workload: planning-rational actions + Supplementation of task variability + Holism of services – Intransparency: missing information – Higher workload: compensatory actions
Method Autonomy	+ Execution of interaction work unaffected + Deviation from system instructions + Support in choice of methods and tools	+ Execution of interaction work unaffected + Options for action expanded – Threat to experiential knowledge – Confidence/following of system outputs
Criteria Autonomy	+ Support of work targets (quantity) + Higher sense of security – Transparency of tasks in real time	+ Support of work targets (quantity + quality) – Intransparency: questionable output – Missing indicators for evaluating performance
Scheduling Autonomy	+ Time gains + Predictability + Task prioritization/sequence unaffected	+ Time gains – Influence on task prioritization/sequence – Parallelism of tasks/intensification
Working Time Autonomy	+ Flexibility and time gains	(– Flexibility demands)
Locational Autonomy	+ Information access + Location-independence	(– Flexibility demands)
Interactional Autonomy	+ Higher quality of information + Facilitated teamwork + Administrative tasks away from client	+ Individualization and quality of service – Emotional demands – Intransparency: information asymmetries

Compared to rule-based systems, learning ADM succeeds in having a positive effect on Task Autonomy, in particular by offering a broader range of tasks, either because these systems directly recommend options or because automated tasks create new scope for other duties, thus increasing the overall holistic nature of work tasks. Less work is required due to the takeover of rational planning activities. While choices for work actions have increased in the examples mentioned, the execution, in particular the interaction work typical of service work, remains unaffected (Method Autonomy), as is also the case with rule-based systems. In the perception of the employees, the achievement of work objectives is increased not only in terms of quantity but also in terms of quality (Criteria Autonomy) – especially to the extent that information and action sequences are revealed that would either be very difficult or not available at all to employees without the output capability of the systems. This

support for achieving work targets is closely linked to the time gains made possible by using the systems (Scheduling Autonomy).

Up to now, digital and rule-based technical systems have been responsible for influencing Working Time and Locational Autonomy. Regarding learning systems, no significant impact has been identified, particularly in jobs with a high proportion of interactions. At most, changes in the flexibility requirements for employees can be expected in the future, for example, if the time and location preferences of clients are incorporated to a greater extent into system calculations.

New conflicts and contradictions in dealing with learning ADM arise in three main areas: the possible lack of traceability and transparency of system outputs, the associated intervention in interaction activities, and the automated takeover of management tasks. Both case studies unite to create even greater transparency regarding individual tasks and their execution. However, this is due to the purely digital nature rather than the learning elements of ADM. These, by contrast, tend to create intransparency for both management and employees. The intransparency of system outputs, or rather, the lack of traceability of how the results were generated, what data was included, and how the results are to be evaluated by employees, may have a negative impact on job autonomy in many ways. In particular, the lack of information at work can undermine the holistic nature of work tasks and often require time-consuming rework and follow-up research. The lack of information may imply a certain devaluation of employees' work in the sense of non-participation.

Employees try to understand why the ADM system has made a certain decision through their own research and thus nullify possible efficiency gains. Especially in combination with interaction work, a lack of information offers a high potential for conflict because employees may lose their status as experts and naturally want to minimize uncertainties when working with people to maintain service quality. The intransparency of learning ADM can therefore have a central impact on the achievement of work objectives if, in case of doubt, they do not take situational compensatory measures. How can one's own work results be assessed in the absence of transparency, anyway? Nothing less than the complete elimination of Criteria Autonomy is feasible.

An interesting contrast arises regarding Interactional Autonomy. The individualization of service activities based on the analysis of learning ADM has a positive effect on the relationship between service employees and service recipients. Learning ADM directly or indirectly improves the coordination, efficiency, and security of certain work processes, which is reflected in higher service quality overall. However, the emotional demands placed on employees are not unaffected when a lack of trans-

parency in system output and information asymmetries come up against highly situational interaction settings. If using these ADM systems also promotes these information asymmetries between colleagues, any qualitative, quantitative, or time-related benefits associated with using the system could be nullified.

The potential influence of learning ADM on interaction work has already been indicated, but it potentially goes far beyond this. What needs to be questioned is the extent to which ADM systems pose a threat to subjectivizing work actions and experiential knowledge. After all, learning ADM systems implies a fundamental change because they generate experiential knowledge themselves and apply it in a context-specific manner. This trading of experiential knowledge with the system does not necessarily have to affect job autonomy negatively if it is made available to service employees in a complementary way and the assessment of its quality remains with the workers.

However, the actual implementation of automation has often shown in practice that workers' skills are underestimated and machine capabilities are overestimated, so the replacement of experience-based interaction work must be addressed critically. The danger of transferring experience-based work to ADM systems lies not only in the devaluation of service employees and a massive loss of meaning and motivation, but also in a loss of quality for service recipients. Incidentally, there are also technical mechanisms that can create transparency in supposed black box systems. However, these are not yet legal obligations. Since these technical possibilities are not being exploited, a certain corporate interest must also be assumed behind the lack of transparency.

Overestimating the capabilities of ADM systems can be reflected in their planning and management skills. There is no doubt that learning systems in particular are better suited to processing and combining huge amounts of data than workers, but these systems also have an essential element that can have a significantly intensifying effect on the work of employees, namely the time component. This refers not only to the integration of real-time data in ADM calculations but also to the fundamental linking of system outputs to specific time periods (e.g., time-limited client preferences or traffic patterns). Learning ADM can thus influence the prioritization and planning of work tasks, may cause their parallelization, and generally has a work-compressing character.

Finally, this principle of intensification addresses the frequently mentioned issue of performance optimization. In the case of learning ADM, there are fewer signs of a shift towards direct control mechanisms but a solidification of indirect control mechanisms, which also potentially decouples middle management from decision-making processes or even

eliminates them altogether. In both case studies, these tendencies have certainly become visible, with central tasks or target achievement mechanisms being shifted to the respective ADM systems. Even if the human component has not been eliminated, mainly because the ADM results have not yet been competitive with the experience-based actions of workers and their supervisors, the replacement of management positions is a target corridor for deploying learning ADM. The result would be a further distancing of employees from company management, which may open more freedom at the working level of employees but may also result in the voice of individual employees in the company becoming increasingly quieter. If there is also a decoupling of team structures, the isolation practices of individual employees will manifest. These areas of conflict must be actively counteracted if the positive potential of learning ADM, which undoubtedly exists, is to be fully realized.

19. Corporate strategies becoming tangible

Insights into the corporate strategy behind the utilization of a certain ADM system cannot be gained from the outside, but only by examining the functioning and organization of a company in depth. This means that the corporate strategies were not clear when the case studies in outpatient care and banking services were selected. In retrospect, however, this categorization provides excellent explanations for the observations in both cases and beyond.

As an example of LAS, the organizational conditions in outpatient care are fundamentally predestined to be embedded in the logic of digital Taylorism: clearly separable and time-defined tasks fundamentally enable ADM systems to act as the pacesetter of work. The quantifiability of individual tasks in real time and the link to location-based data open huge control potential, which is also used in this way in other care companies. Comparisons with highly automated and algorithmically planned services such as logistics are obvious, at least regarding those organizational aspects of the work apart from direct interaction with clients. In this case study, however, these developments are only visible as potentials, and behind them lies a corporate strategy that does not focus on control. This perception shows that the use of ADM systems for process rationalization and optimization is even supported by employees and must not necessarily be imposed by management.

Of course, in this case, one can speak of an example of good practice in which certain particularities are present, such as the IT background of the managing director, who is the main driver of the company's affinity for technology, or the predominantly negative previous experience of the employees in other settings and companies, which leads to a common desire to do things differently. The size of the company also plays a role; although organizational and technical requirements are not proportional, they are disproportionately greater in large companies. Informal practices for coping with work can, however, be assumed regardless of the size of the company.

What remains is that both purely digital systems and learning ADM systems can be used in LAS as a tool for process optimization for the benefit of employees. This is not about full automation, but rather the optimization of tasks that lie outside the immediate core of care work. The example of care work shows that branches with a relatively low level of digitalization already benefit from fairly simple digital systems, especially if they standardize processes, centralize information, and create location independence in order to offer employees a certain degree of flexibility.

The selectively used learning elements of ADM also bring relief and are welcomed by both middle management and employees. One condition, however, is that the employees remain in control of the interpretation and evaluation of the system output. The overall conclusion is that, particularly in branches that are still less digitized, process digitization and rule-based ADM are not inferior in importance to learning ADM systems for the time being.

As an example of HAS, banking services form a clear contrast to their counterparts and are in line with other branches in this group in that there is hardly any need to discuss basic digital process optimization, such as in the care sector. Processes are already largely digital. In the case of HAS, there is a debate about the extent to which process rationalization and optimization can even be a primary corporate strategy when using ADM systems. Perhaps, from a corporate perspective, new methods must be found to access the labor power of employees. In the example of banking services, this consideration is confirmed as far as the control potential behind the analyzed ADM system can play a formative role for bank advisors in the future.

The ML-based ADM example can be understood as a targeted attempt to intervene in the interaction activities of employees by specifically suggesting clients and content. So far, it has been an area that has remained largely untouched by technology. Of course, technology has also found its way into client contact and service areas. However, when it comes to areas that focus intensively on individual advice, research, recommendations, or knowledge transfer, the strengths of workers have manifested. The case study continues to rely on these strengths, and there is no prospect of fully automating client management and contact. However, this specific example shows the attempt of a traditional universal bank to further standardize processes around and with clients, similar to pure digital banks. This also implies the devaluation of the experience and knowledge of employees, whose significance threatens to erode even further in the future. Ultimately, this attempt to remove the utilization of experiential knowledge is based on management's devaluation interests.

As has already been described in sufficient detail, the financial sector is experiencing an industrialization of service activities – a narrative that until now has tended to be associated with Tayloristic approaches to services or manufacturing industries. Marketization efforts still exist, of course, and a shift towards direct control mechanisms cannot yet be spoken of in this example. Nevertheless, the question arises as to whether a recombination of known control mechanisms can be identified for HAS in the future, which, by means of learning ADM, will provide new access possibilities to experience-led work. It must be assumed that there is

a fine line between influencing these meaningful and motivating parts of work for the purpose of control and the continued granting of job autonomy to maintain self-control and self-optimization mechanisms.

Overall, the impact of using an ADM system on job autonomy depends less on the specific technical features of the system and more on its organizational embedding. ADM can always be exploited for control mechanisms, and its learning elements even tap into the profoundly important experiential knowledge of service employees – but only if using technology and ADM take priority over the decisions of the employees. If the focus remains on decision support, the positive effects on job autonomy take center stage. If ADM results in a direct and irrevocable compulsion to act, job autonomy suffers. Both can be organizationally desirable for the company.

If using ADM in LAS, as in the case study, tends to focus on objectifying actions that can be easily formalized, a positive contribution to job autonomy is possible. This development should not be underestimated for LAS, as there is potential for job autonomy in all dimensions. Since the subjective elements at work are less affected, there are cases that break with the narrative of digital Taylorism and the utilization of technology as a control instrument. Perhaps this applies in particular to highly person-oriented tasks, which have always been in conflict with the characteristics of restricted working environments due to the need to incorporate subjective elements into the work.

As far as the deployment of ADM in HAS is concerned, the focus may not be on the automating character of the systems but initially on their assistive-complementary character. This may actually be about supporting employees – but to what end? If it is the exploitation of subjectifying action, then the focus is rather on intensification, i.e., an overall worsening of the work situation. In this case study, the potential for relief through the support and transfer of tasks in the planning/administrative area must be distinguished from opportunities to intervene in the subjective part of work, which can ultimately lead to a loss of experiential knowledge and motivation. ADM systems in HAS are embedded in existing marketization and exploitation logics to the extent that their supportive properties contribute to desired self-control and self-optimization mechanisms in objectifying work activities. However, they contradict this narrative in their attack on experience-led work, which raises the question as to the conditions of highly autonomous services anew.

Based on the empirical work of this thesis, the possibility of a consolidation of the various forms of job autonomy in the service sector emerges (and not without surprise). There are constellations in which

branches with highly oppressive, intensive conditions characterized by little job autonomy can gain degrees of freedom and thus also relief through using ADM and a corresponding corporate strategy that is based less on control. In contrast, there are also highly autonomous services based on self-control and self-optimization, which may lose degrees of freedom resulting from the expansion of control and interference in the employees' authority to interpret interaction work, which means that the intensity and stress levels in these activities will not decrease in the foreseeable future.

20. Outlook and reflections

This thesis primarily provides a structured analysis of the influence of novel ADM systems on the job autonomy of employees in the service sector. It lays the foundation for further work on the subject of negotiating job autonomy in the workplace, the success of positive autonomy experiences with the use of technology, and identifying organizational conditions and boundaries that are necessary to maintain or create appealing working conditions.

Part I of this thesis lays the theoretical and conceptual foundations for dealing systematically with the interplay between job autonomy and ADM systems. Particular emphasis was placed on presenting a comprehensive but also transferable concept of job autonomy that attempts to do justice to the modern conditions of work and will hopefully also be useful in further studies.

At the beginning of this work, the focus was quickly placed on service workers and less on the entire sector, i.e., those employees who have to work particularly close to other people. This proved to be very fruitful, as the interaction work performed by them in particular harbors potential for conflict regarding ADM systems. The theoretical and conceptual considerations in particular revealed gaps of knowledge regarding the interplay of interaction work and the use of learning ADM, which point to the need for further theory development that goes far beyond this thesis. It is not yet foreseeable what influence the learning elements of new types of ADM will have on experience-led and situational work behavior, as practiced so intensively by service employees. However, it is clear that intensive interaction work will continue to be an area of conflict between employees and employers in the future. From the company's perspective, it is one of the large remaining levels of uncertainty in which employees, even if restrictions become clear, try to maintain their sovereignty. There should be no shortage of exciting case studies in which this field of research can be observed in the future.

Part II of this thesis has revealed a clear divide within the service sector in terms of job autonomy, which speaks volumes about existing inequalities. Nevertheless, a number of similarities within the service sector have become apparent, which legitimize transferability between individual branches. Further research needs and opportunities are abundant in the context of quantifying job autonomy. It is desirable to repeat the analyses carried out with more up-to-date and in-depth data, particularly regarding technology use, and to isolate the connecting lines and dependencies between individual dimensions of job autonomy. The latter point

in particular, namely the dependencies between different autonomy dimensions, can provide enormous added value in terms of understanding patterns of stress and motivation.

Part III ultimately aimed to reflect the utilization of ADM systems in practice in as much detail as possible. Certainly, some nuances in the deployment of technology are specific to the respective company constellations. Nevertheless, patterns of impact on job autonomy from ADM systems can be clearly identified. These findings are of immense value in understanding the organization of companies as a whole. A holistic approach is an essential factor in gaining this knowledge. Far too often, the use of certain technologies, but also other interventions in work processes, is viewed in isolation and hardly embedded in the practical everyday lives of employees.

Of course, these two case studies are not sufficient to capture the complexity and diversity of even just one service branch. There is a need for far more concrete examples and cross-sector comparative studies that are brought to the public's attention and that show how the still-intangible concept of AI is being applied. This would also contribute to a more realistic assessment of the potentials and dangers for society and, in particular, reduce (or at least make assessable) fears that individual technologies and, thus, individual private companies have too great an influence on work and life. The aim of research in these areas must include not only providing this educational work but also communicating it to the public in an understandable manner. Moreover, the application of AI, its development, physical utilization, required resources, and ultimately its social impact must be viewed globally, beyond the Eurocentric perspective.

From the perspective of Germany (and Europe), the most important research and development drivers, companies, market capitalizations, and manufacturers are concentrated in the USA or China (e.g., Bryson & Malikova, 2021, pp. 4–6). This can lead to ever-new areas of conflict, e.g., regarding European data protection principles or German labor law. In this respect, AI is considered a subject of regulation for political actors.

There is no question that legislative action is needed (e.g., GI, 2018, p. 8), and this is well known to decision-makers and lawmakers. In its current form, the GDPR is too incomplete to provide comprehensive protection for employees. In the future, hopes must be pinned on the introduction of employee data protection and the AI Act to create a binding legal basis for companies. However, we should not tire of pointing out existing laws and rights, such as the right to co-determination in companies when introducing new technologies or risk assessment in the workplace.

It is well known that the difficulty lies both in enforcing existing laws and rights and in formulating new legal measures that also cover novel AI systems and their dynamic development. However, the creation of legal certainty ultimately benefits not only employees and their representatives, but also companies. Agreeing on a common basis for action must be the goal for the future, as the quality of employment conditions and the weight of employees' voices also depend on it. Hopefully, substantial regulations will be drawn up as part of the upcoming legislative changes, and these will not be undermined by excessive political influence from individual interest groups before they come into force.

In conclusion, I can only formulate a plea for needs-based approaches to the interplay between technology and work. There is far too little discussion in society about which goals are to be achieved with technology, how these can be achieved, and whether these objectives have any social benefit at all. In view of dwindling human and natural resources, the question of the sensible and socially necessary deployment of technology must come to the fore. The need for discussing the rational and socially beneficial usage of technologies is all too often subject to the supposed potential for additional capital utilization. In any case, and in view of workers' desire for job autonomy, excessive technology-based control of work performance and output, whether direct or indirect, appears to be an outdated corporate objective.

Appendix | Introduction | Part I

Table 14: Service branches according to WZ 2008

Branch	Code
Wholesale and retail trade; repair of motor vehicles and motorcycles	Section G
Wholesale and retail trade and repair of motor vehicles and motorcycles	Division 45
Wholesale trade, except of motor vehicles and motorcycles	Division 46
Retail trade, except of motor vehicles and motorcycles	Division 47
Transportation and storage	Section H
Land transport and transport via pipelines	Division 49
Water transport	Division 50
Air transport	Division 51
Warehousing and support activities for transportation	Division 52
Postal and courier activities	Division 53
Accommodation and food service activities	Section I
Accommodation	Division 55
Food and beverage service activities	Division 56
Information and communication	Section J
Publishing activities	Division 58
Motion picture, video and television prog. prod., sound rec. and music pub. activities	Division 59
Programming and broadcasting activities	Division 60
Telecommunications	Division 61
Computer programming, consultancy and related activities	Division 62
Information service activities	Division 63
Financial and insurance activities	Section K
Financial service activities, except insurance and pension funding	Division 64
Insurance, reinsurance and pension funding, except compulsory social security	Division 65
Activities auxiliary to financial services and insurance activities	Division 66
Real estate activities	Section L
Real estate activities	Division 68
Professional, scientific and technical activities	Section M
Legal and accounting activities	Division 69
Activities of head offices; management consultancy activities	Division 70
Architectural and engineering activities; technical testing and analysis	Division 71
Scientific research and development	Division 72
Advertising and market research	Division 73
Other professional, scientific and technical activities	Division 74
Veterinary activities	Division 75

Administrative and support service activities	Section N
Rental and leasing activities	Division 77
Employment activities	Division 78
Travel agency, tour operator and other reservation service and related activities	Division 79
Security and investigation activities	Division 80
Services to buildings and landscape activities	Division 81
Office administrative, office support and other business support activities	Division 82
Public administration and defence; compulsory social security	Section O
Public administration and defence; compulsory social security	Division 84
Education	Section P
Education	Division 85
Human health and social work activities	Section Q
Human health activities	Division 86
Residential care activities	Division 87
Social work activities without accommodation	Division 88
Arts, entertainment and recreation	Section R
Creative, arts and entertainment activities	Division 90
Libraries, archives, museums and other cultural activities	Division 91
Gambling and betting activities	Division 92
Sports activities and amusement and recreation activities	Division 93
Other service activities	Section S
Activities of membership organisations	Division 94
Repair of computers and personal and household goods	Division 95
Other personal service activities	Division 96

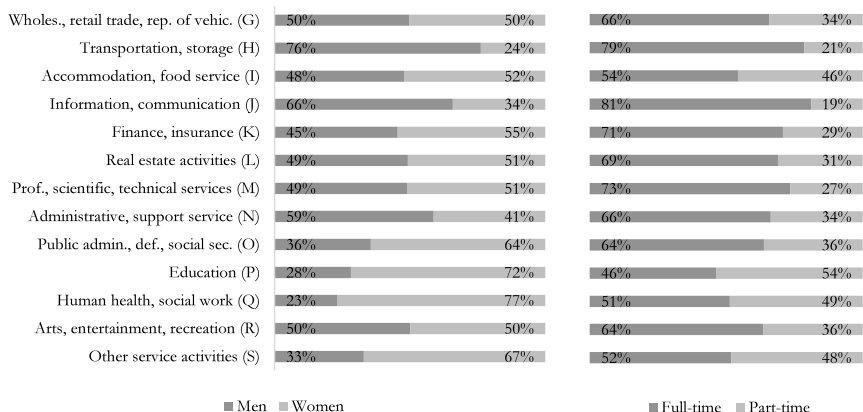
Source: Destatis (2008a) in German. English translation in Destatis (2008b).

Table 15: Employment by branch, employment status, sex, working time, 2022

	Regularly employed		Marginally employed	
	Total	Share	Total	Share
Total economy	34.705.174	100 %	7.609.194	100 %
Service sector	24.997.813	72 %	6.314.924	83 %
Men	11.144.829	45 %	2.692.799	43 %
Women	13.852.984	55 %	3.622.125	57 %
Full-time	15.822.971	63 %	–	–
Part-time	9.174.842	37 %	–	–
Wholes., retail trade, rep. of vehic. (G)	4.645.666	19 %	1.271.759	20 %
Transportation, storage (H)	1.946.424	8 %	453.225	7 %
Accommodation, food service (I)	1.039.410	4 %	977.109	15 %
Information, communication (J)	1.323.226	5 %	134.256	2 %
Finance, insurance (K)	970.204	4 %	75.884	1 %
Real estate activities (L)	305.731	1 %	263.228	4 %
Prof., scientific, technical services (M)	2.510.603	10 %	432.913	7 %
Administrative, support service (N)	2.317.900	9 %	951.875	15 %
Public admin., def., social sec. (O)	2.030.677	8 %	119.093	2 %
Education (P)	1.436.345	6 %	251.920	4 %
Human health, social work (Q)	5.315.319	21 %	813.925	13 %
Arts, entertainment, recreation (R)	302.295	1 %	243.392	4 %
Other service activities (S)	854.013	3 %	326.345	5 %

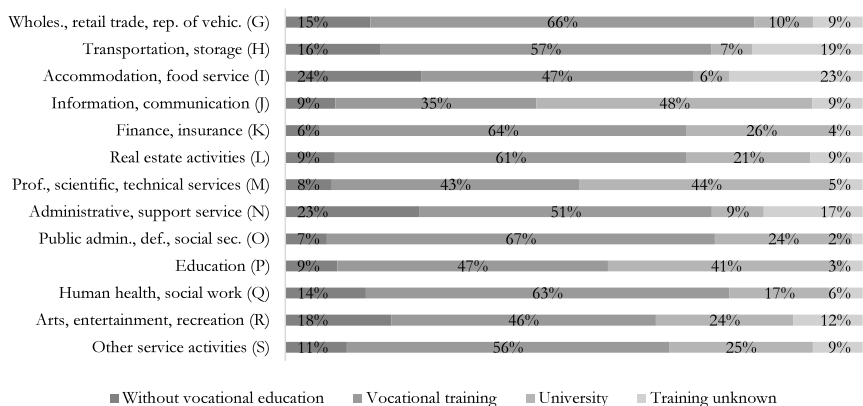
Notes: Reporting date Dec 31, 2022.

Source: Statistics of the Federal Employment Agency in BA (2023b).

Figure 18: Employment shares by branch, sex, working time, 2022

Notes: Regularly employed. Reporting date Dec 31, 2022.

Source: Statistics of the Federal Employment Agency in BA (2023b). Own calculations.

Figure 19: Employment shares by branch, qualification, 2022

Notes: Regularly employed. Reporting date Dec 31, 2022.

Source: Statistics of the Federal Employment Agency in BA (2023b). Own calculations.

Table 16: Employment growth by branch, working time, qualification, 2018–2022

	Total	Full-time	Part-time	W/o voc. qualif.	Vocational training	University
Total economy	4 %	2 %	10 %	7 %	1 %	20 %
Service sector	6 %	4 %	10 %	11 %	3 %	22 %
Wholes., retail trade, rep. of vehic. (G)	2 %	1 %	6 %	12 %	0 %	25 %
Transportation, storage (H)	6 %	5 %	10 %	19 %	4 %	34 %
Accommodation, food service (I)	–2 %	–1 %	–4 %	6 %	–6 %	24 %
Information, communication (J)	20 %	19 %	23 %	21 %	9 %	35 %
Finance, insurance (K)	0 %	–1 %	3 %	3 %	–5 %	20 %
Real estate activities (L)	13 %	11 %	17 %	24 %	10 %	29 %
Prof., scientific, technical services (M)	11 %	8 %	18 %	12 %	5 %	21 %
Administrative, support service (N)	0 %	–1 %	1 %	9 %	–4 %	18 %
Public admin., def., social sec. (O)	11 %	9 %	15 %	3 %	8 %	26 %
Education (P)	9 %	4 %	14 %	11 %	9 %	11 %
Human health, social work (Q)	8 %	4 %	13 %	10 %	6 %	21 %
Arts, entertainment, recreation (R)	3 %	1 %	7 %	8 %	0 %	19 %
Other service activities (S)	1 %	–3 %	7 %	1 %	–2 %	17 %

Notes: Reporting dates Dec 31, 2018 and Dec 31, 2022.

Source: Statistics of the Federal Employment Agency in BA (2023b) and BA (2019). Own calculations.

Table 17: Influence of digitalization on selected job characteristics by branch, 2022

	Decision-making scope			Workload			Parallel processes			Monitoring and control		
	Increase	No change	Decrease	Increase	No change	Decrease	Increase	No change	Decrease	Increase	No change	Decrease
Wholes., retail trade; rep. of vehic.	26 %	64 %	10 %	48 %	46 %	6 %	48 %	47 %	4 %	33 %	60 %	7 %
Transportation, storage	17 %	71 %	13 %	39 %	49 %	12 %	46 %	52 %	1 %	42 %	50 %	8 %
Information, communication	28 %	65 %	7 %	41 %	56 %	3 %	52 %	46 %	2 %	24 %	70 %	6 %
Finance, insurance	17 %	69 %	14 %	55 %	44 %	1 %	50 %	50 %	0 %	34 %	63 %	3 %
Prof., scientific, technical services	25 %	65 %	10 %	54 %	38 %	8 %	46 %	47 %	7 %	32 %	64 %	4 %
Public admin., def., social sec.	18 %	74 %	8 %	48 %	46 %	5 %	41 %	56 %	3 %	38 %	58 %	4 %
Education	25 %	66 %	8 %	54 %	43 %	3 %	45 %	54 %	1 %	27 %	67 %	6 %
Health	17 %	71 %	12 %	54 %	38 %	8 %	46 %	48 %	6 %	42 %	54 %	5 %
Social Service	12 %	79 %	9 %	46 %	49 %	4 %	43 %	53 %	4 %	41 %	50 %	9 %

Source: DGB-Index (2022b). Table 18, 20, 22, 28.

Appendix | Part II

Table 18: *Decomposition of job autonomy dimensions with recoding in 2018*

Autonomy Dimension	No.	Variable	Question	Answers	Effect	Recoding
Task Autonomy	1	F411_03	How often does it happen in your work that one and the same work process is repeated down to the last detail?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	-	0; 1; 2; 3; missing
	2	F411_05	How often does it happen in your work that you improve on existing procedures or try something new?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	+	3; 2; 1; 0; missing
	3	F700_03	How often does it happen that you have influence over the amount of work assigned to you?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	+	3; 2; 1; 0; missing
	4	F700_08	How often does it happen that you are not informed in time about important decisions, changes, or plans for the future?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	-	0; 1; 2; 3; missing
	5	F503	Do you perform your tasks mainly according to instructions or mainly independently?	predominantly following instructions (1); predominantly independent (2); both equally frequent (3); not stated (9)	-	0; 2; 1; missing
Method Autonomy	1	F327_03	How often does it happen in your work that you have to identify and close your own knowledge gaps?	frequently (1); sometimes (2); never (3); not stated (9)	+	2; 1; 0; missing
	2	F411_02	In your work, how often do you find yourself being told how to perform the work down to the last detail?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	-	0; 1; 2; 3; missing
	3	F411_04	How often in your work do you find yourself faced with new tasks that you first have to think about and familiarize yourself with?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	+	3; 2; 1; 0; missing

Criteria Autonomy	1	F411_07	How common is it in your work that you are prescribed an exact number of pieces, a certain minimum output, or the time to complete a certain job?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	-	0; 1; 2; 3; missing
	2	F411_12	How often does your work require you to push yourself to the limit?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	-	0; 1; 2; 3; missing
	3	F411_01	How often does your job involve working under intense deadline or performance pressure?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	-	0; 1; 2; 3; missing
Scheduling Autonomy	1	F411_06	How often do you experience disruptions or interruptions in your work, e.g., due to colleagues, bad material, machine malfunctions, or telephone calls?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	-	0; 1; 2; 3; missing
	2	F411_09	How often does your work require you to keep track of different types of work or processes at the same time?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	-	0; 1; 2; 3; missing
	3	F700_02	How often does it happen that you can plan and schedule your own work?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	+	3; 2; 1; 0; missing
Working Time Autonomy	4	F700_06	How often does it happen that you can decide for yourself when to take a break?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	+	3; 2; 1; 0 (=4 or 8); missing
	1	F208*	How often do you manage to take your family and private interests into account when planning your working hours?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	+	3; 2; 1; 0; missing
	2	F209	Are your working hours normally between 7 am. and 7 pm.?	yes (1); no (2); not stated (9)	+	1; 0; missing
	3	F216_04*	Have you arranged the following in your job? (on-call duty, work on demand etc.) – not of the above	not stated (0); stated (1)	+	0; 1
	4	F220*	Do you usually work on Saturdays, at least once a month?	yes (1); no (2); not stated (9)	-	0; 1; missing
	5	F223*	Do you usually work on Sundays, at least once a month?	yes (1); no (2); not stated (9)	-	0; 1; missing

Locational Autonomy	1	F228*	Do you work for your company – even if only occasionally – from home?	yes (1); no (2); not stated (9)	+	1; 0; missing
	2	F229* &	How often does this occur?	always (1); frequently (2); some- times (3); rarely (4); not stated (9)	+	5 (F229=1); 4 (F229=2); 3 (F229=3); 2 (F229=4); 1 (F232=1 or F232=2); 0 (F232=3); missing (F229=9 or F232=9)
Interactional Autonomy		F232*	If your company gave you the option of working at home at times, would you accept this offer?	yes (1); no (2); not possible in my work (3); not stated (9)		
	1	F327_04	How often does your job require you to take responsibility for others?	frequently (1); sometimes (2); never (3); not stated (9)	-	0; 1; 2; missing
	2	F327_05	How often does your work involve convincing others and negotiating compromises?	frequently (1); sometimes (2); never (3); not stated (9)	-	0; 1; 2; missing
	3	F700_12	How often do you get help and support for your work from colleagues when you need it?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	+	3; 2; 1; 0; missing
	4	F700_13	And how often do you get help and support for your work from your direct supervisor when you need it?	frequently (1); sometimes (2); rarely (3); never (4); does not apply (8); not stated (9)	+	3; 2; 1; 0; missing (=8 or 9)

Notes: Own translation, collection, and item assignment.
Source: BIBB/BauA-ETB 2018.

Table 19: *Decomposition of job autonomy dimensions with recoding in 2012*

Autonomy Dimension	No.	Variable	Question	Answers	Effect	Recoding
Task Autonomy	1	F411_03	How often does it happen in your work that one and the same work process is repeated down to the last detail?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	-	0; 1; 2; 3; missing
	2	F411_05	How often does it happen in your work that you improve on existing procedures or try something new?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	+	3; 2; 1; 0; missing
	3	F700_03	How often does it happen that you have influence over the amount of work assigned to you?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	+	3; 2; 1; 0; missing
	4	F700_08	How often does it happen that you are not informed in time about important decisions, changes, or plans for the future?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	-	0; 1; 2; 3; missing
	5	F503	Do you perform your tasks mainly according to instructions or mainly independently?	predominantly following instructions (1); predominantly independent (2); both equally frequent (3); not stated (9)	-	0; 2; 1; missing
Method Autonomy	1	F327_03	How often does it happen in your work that you have to identify and close your own knowledge gaps?	frequently (1); sometimes (2); never (3); not stated (9)	+	2; 1; 0; missing
	2	F411_02	In your work, how often do you find yourself being told how to perform the work down to the last detail?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	-	0; 1; 2; 3; missing
	3	F411_04	How often in your work do you find yourself faced with new tasks that you first have to think about and familiarize yourself with?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	+	3; 2; 1; 0; missing
Criteria Autonomy	1	F411_07	How common is it in your work that you are prescribed an exact number of pieces, a certain minimum output, or the time to complete a certain job?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	-	0; 1; 2; 3; missing

2	F411_12	How often does your work require you to push yourself to the limit?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	-	0; 1; 2; 3; missing
3	F411_01	How often does your job involve working under intense deadline or performance pressure?	frequently (1); sometimes (2); rarely (3); never (4); not stated (9)	-	0; 1; 2; 3; missing
Scheduling Autonomy	1	F411_06	How often do you experience disruptions or interruptions in your work, e.g., due to colleagues, bad material, machine malfunctions, or telephone calls?	-	0; 1; 2; 3; missing
	2	F411_09	How often does your work require you to keep track of different types of work or processes at the same time?	-	0; 1; 2; 3; missing
	3	F700_02	How often does it happen that you can plan and schedule your own work?	+	3; 2; 1; 0; missing
	4	F700_06	How often does it happen that you can decide for yourself when to take a break?	+	3; 2; 1; 0 (=4 or 8); missing
Working Time Autonomy	1	F208*	How often do you manage to take your family and private interests into account when planning your working hours?	+	2; 1; 0; missing
	2	F209	Are your working hours normally between 7 am. and 7 pm.?	+	1; 0; missing
	3	F216*	Do you work demand or have on-call duty?	-	0; 1
	4	F218* &	Do you work – even if only occasionally – on Saturdays?	-	1 (F220=96 or F220=97 or F218=2); 0 (F220=1 or F220=2 or F220=3 or F220=4 or F220=5); missing (F218=9 or F220=99)

F220*		On how many Saturdays do you work on average per month?	1; 2; 3; 4; 5; less than once a month (96); changes, can't say (97); not stated (99)	
5	F221* &	Do you work – even if only occasionally – on Sundays?	yes (1); no (2); not stated (9)	– 1 (F223=96 or F223=97 or F221=2); 0 (F223=1 or F223=2 or F223=3 or F223=4 or F223=5); missing (F221=9 or F223=99)
F223*		On how many Sundays do you work on average per month?	1; 2; 3; 4; 5; less than once a month (96); changes, can't say (97); not stated (99)	
Interactional Autonomy	1	F327_04	How often does your job require you to take responsibility for others?	– 0; 1; 2; missing
	2	F327_05	How often does your work involve convincing others and negotiating compromises?	– 0; 1; 2; missing
	3	F700_12	How often do you get help and support for your work from colleagues when you need it?	+ 3; 2; 1; 0; missing
	4	F700_13	And how often do you get help and support for your work from your direct supervisor when you need it?	+ 3; 2; 1; 0; missing (=8 or 9)

Notes: Own translation, collection, and item assignment.
Source: BIBB/BauA-ETB 2018.

Table 20: Observations and shares by branch, 2018 and 2012

Branch	Observations 2018	Share 2018	Observations 2012	Share 2012
Service sector	11.738	100 %	10.896	100 %
Wholes., retail trade, rep. of vehic. (G)	1.242	11 %	1.484	14 %
Transportation, storage (H)	785	7 %	686	6 %
Accommodation, food service (I)	323	3 %	317	3 %
Information, communication (J)	746	6 %	627	6 %
Finance, insurance (K)	647	6 %	724	7 %
Real estate activities (L)	113	1 %	104	1 %
Prof., scientific, technical services (M)	800	7 %	586	5 %
Administrative, support service (N)	444	4 %	432	4 %
Public admin., def., social sec. (O)	1.714	15 %	1.642	15 %
Education (P)	1.809	15 %	1.395	13 %
Human health, social work (Q)	2.583	22 %	2.328	21 %
Arts, entertainment, recreation (R)	181	2 %	159	1 %
Other service activities (S)	351	3 %	412	4 %

Source: BIBB/BAuA-ETB 2018 and 2012. Own calculations.

Table 21: Source variables, observations, shares of secondary variables, 2018 and 2012

Variable/Specification	Source variable		Share 2018	Share 2012
Task type	see Table 22	N=	11.738	10.896
Management			30 %	31 %
Information-related			38 %	38 %
Object-related			16 %	18 %
Person-related			28 %	26 %
Educational attainment	max1202/Max1202	N=	11.716	10.893
W/o voc. qualification			5 %	7 %
Vocational training			48 %	57 %
Upgrading training			6 %	6 %
University			41 %	30 %
Sex	S1	N=	11.738	10.896
Female			61 %	64 %
Male			39 %	36 %
Company size	F515	N=	11.456	10.544
Micro company			12 %	14 %
Small company			28 %	29 %
Medium company			29 %	27 %
Large company			32 %	30 %
Working hours per week	az	N=	11.738	10.896
10 to 20			12 %	14 %
21 to 30			17 %	15 %
31 to 40			39 %	39 %
More than 40			32 %	32 %
Length of employment	F510	N=	11.693	10.859
More than 10 years			54 %	58 %
Up to 10 years			19 %	16 %
Up to 5 years			17 %	17 %
Up to 2 years			10 %	9 %

ADM Knowledge	see Table 23	N=	1.811	1.421
Basic			79 %	77 %
Advanced			21 %	23 %
Knowledge intensity	TI_KI	N=	11.738	10.657
KIS			74 %	86 %
LKIS			26 %	14 %
Changes in work environment	see Table 24	N=	11.239	10.449
Low			68 %	65 %
Middle			16 %	17 %
High			16 %	18 %
Frequency of making difficult decisions	F327_02	N=	11.734	10.891
Never			12 %	12 %
Sometimes			43 %	45 %
Frequently			46 %	43 %

Notes: The generated variables are based on the listed source variables. The specifications of the variables age group, company size, and working hours are created by the author. Task type, ADM knowledge, and changes in work environment are generated variables. Differences in the number of observations are due to missing values in the responses.

Source: BIBB/BAuA-ETB 2018 and 2012. Own calculations.

Table 22: Decomposition of variable task type

Task type	Variable	Question	Inclusion criterion	Operator (Inclusion)	Exclusion criterion	Operator (Exclusion)
Management	F301	Do you have employees for whom you are <the> direct supervisor?	F301=1			
Information-related	Please tell me how often these activities occur in your work, whether frequently (1), sometimes (2), or never (3):					
	F304	Measure, test, control quality	F304=1	OR	F301=1	OR
	F310	Organizing, planning, and preparing work processes.	F310=1	OR	F312=1	OR
	F311	Develop, research, construct	F311=1	OR	F315=1	OR
	F313	Collecting information, researching, documenting	F313=1	OR	F316=1	OR
	F314	Advise and inform	F314=1	OR		
	F318	Working with computers	F318=1	OR		
Object-related	F319	Use of the Internet or edit e-mails	F319=1	OR		
	F303	Manufacture, production of goods and commodities	F303=1	OR	F301=1	OR
	F305	Monitoring, control of machines, equipment, technical process	F305=1	OR	F312=1	OR
	F306	Repair, Recondition	F306=1	OR	F315=1	OR
	F308	Transport, storage, shipping	F308=1	OR	F316=1	OR
	F320	Cleaning, waste removal, recycling	F320=1	OR		
Person-related	F312	Train, teach, instruct, educate	F312=1	OR	F301=1	
	F315	Hosting, accommodating, preparing meals	F315=1	OR		
	F316	Care, nurture, heal	F316=1	OR		

Notes: Own translation. The classification of a respondent to a certain task type is based on the assigned variables listed. This means that the assignment is made as soon as one (reference to operator OR) of these variables has been answered with “frequently” (=1) or yes (=1) and the inclusion criterion has thus been met. The assignment is excluded as soon as an exclusion criterion is fulfilled. Source: BIBB/BAuA-ETB 2018 and 2012. Own calculations.

Table 23: *Decomposition of variable ADM knowledge*

ADM knowledge	Variable	Question	Inclusion criterion	Operator (Inclusion)
Basic		Please tell me how often these activities occur in your work, whether frequently (1), sometimes (2), or never (3):		
	F313	Collecting information, researching, documenting	F313=1	AND
	F318	Working with computers	F318=1	AND
		For each area, please say whether you need this knowledge in your current job as <...> and, if so, whether basic (2) or advanced (3).		
	F403_04	Knowledge in the field of mathematics, specialized arithmetic, statistics	F403_04=3	AND
	F403_06	Knowledge of PC application programs	F403_06=3	AND
Advanced		Please tell me how often these activities occur in your work, whether frequently (1), sometimes (2), or never (3):		
	F313	Collecting information, researching, documenting	F313=1	AND
	F318	Working with computers	F318=1	AND
		For each area, please say whether you need this knowledge in your current job as <...> and, if so, whether basic (2) or advanced (3).		
	F403_04	Knowledge in the field of mathematics, specialized arithmetic, statistics	F403_04=3	AND
	F403_06	Knowledge of PC application programs	F403_06=3	AND
	F324	Do you use computers exclusively as a user (1) or does your usage go beyond simple application (2)?	F324=2	AND

Notes: Own translation. The classification of a respondent to a certain ADM knowledge type is based on the assigned variables listed. This means that the assignment is made if all (reference to operator AND) of these variables have been answered with the inclusion criterion listed above. The only difference between Basic and Advanced is the additional inclusion of the variable F324 in the latter. Source: BIBB/BAuA-ETB 2018 and 2012. Own calculations.

Table 24: Decomposition of variable changes in work environment

Variable	Question
	Now please tell me if the following changes have been made in your <immediate work environment> in the last two years.
F1001_01	New manufacturing or process technologies
F1001_02	New computer programs
F1001_03	New machinery or equipment
F1001_04	New or considerably modified products or materials
F1001_05	New or considerably changed services
F1001_06	Has there been any considerable restructuring or reorganization that affected your immediate work environment?

Notes: Own translation. The variable changes in work environments are based on six selected variables, which assign an index value of 0 to 100 to the observations depending on their characteristics. The assigned variables are all answered with yes, no, do not know, or not stated. The latter two are omitted from the analysis. Consequently, the index value 100 (or 0) is assigned if all questions are answered with yes (or no). The specification of the variable describes three levels: low (index value 0–33), middle (34–66), and high (67–100).

Source: BIBB/BAuA-ETB 2018 and 2012. Own calculations.

Table 25: Detailed summary statistics of Autonomy Index, 2018

Branch	Service Sector	Autonomy Index		Task Autonomy		Method Autonomy		Criteria		Scheduling Autonomy		Working Time Autonomy		Locational Autonomy		Interactional Autonomy																									
		Min	p25/p50/p75/Max	Min	p25/p50/p75/Max	Min	p25/p50/p75/Max	Min	p25/p50/p75/Max	Min	p25/p50/p75/Max	Min	p25/p50/p75/Max	Min	p25/p50/p75/Max	Min	p25/p50/p75/Max																								
Branch	Service Sector	12	42	50	57	80	6	39	50	61	87	3	33	47	64	87	12	34	47	67	94	13	40	48	60	86	4	36	59	73	73	19	19	28	74	94	9	45	53	65	84
		17	41	47	53	78	6	37	46	58	87	3	31	40	53	87	12	36	54	75	94	13	38	48	59	86	5	45	50	59	73	19	19	28	94	9	45	57	70	84	
		12	37	44	51	78	6	32	43	53	84	3	25	34	52	87	12	30	47	67	94	13	40	49	62	86	4	31	46	59	73	19	19	28	94	9	45	57	67	84	
		21	37	43	49	63	8	35	47	56	87	3	25	34	53	87	12	28	47	67	94	13	35	48	59	86	4	23	32	46	73	19	19	28	94	9	41	57	70	84	
		23	52	59	64	79	8	45	57	66	87	13	45	59	79	87	12	34	47	66	94	14	48	59	66	85	5	58	63	73	73	19	28	74	91	94	9	45	57	70	84
		25	47	54	60	80	11	40	51	61	87	11	33	47	59	87	12	30	47	62	94	13	48	49	65	86	9	59	73	73	73	19	28	28	85	94	9	45	57	70	84
		38	47	55	61	78	11	40	51	61	87	14	40	53	68	87	12	39	56	75	94	23	48	50	67	94	4	58	63	73	73	19	28	28	85	94	11	45	57	67	84
		19	51	56	62	78	8	45	55	65	87	3	45	59	68	87	12	30	47	66	94	14	48	50	60	86	4	59	73	73	73	19	28	74	85	94	9	45	57	70	84
		20	42	47	54	72	6	36	46	55	87	3	25	34	53	87	12	38	57	77	94	13	48	52	66	86	4	36	58	63	73	19	19	28	85	94	9	45	57	67	84
		22	44	51	56	80	6	38	48	58	87	3	34	47	64	87	12	36	49	67	94	13	48	48	60	86	4	58	73	73	73	19	19	28	28	94	9	45	57	66	84
23	50	56	61	80	6	50	59	69	87	5	45	59	68	87	12	34	49	67	94	13	40	48	59	86	5	46	63	73	73	19	28	91	91	94	9	35	45	59	84		
13	37	44	51	79	6	39	48	59	87	3	33	45	59	87	12	28	43	62	94	13	33	48	59	86	4	23	46	63	73	19	19	28	94	9	35	45	59	84			
26	41	47	55	75	11	38	47	64	82	3	33	47	67	87	12	38	56	75	94	13	42	49	62	86	4	23	32	58	73	19	19	28	85	94	9	45	57	67	84		
26	45	53	59	79	6	40	53	65	87	3	34	47	64	87	12	38	52	68	94	13	48	56	60	85	5	46	59	73	73	19	19	28	74	94	9	45	57	67	84		
Task type																																									
Branch	Management	13	42	49	56	80	6	43	53	64	87	3	34	52	67	87	12	28	43	62	94	13	41	48	59	86	4	32	50	73	73	19	19	28	85	94	9	35	45	59	84
		12	45	52	59	80	6	37	47	59	87	3	33	45	59	87	12	38	54	74	94	13	48	50	65	86	4	46	63	73	73	19	19	28	74	94	9	46	60	70	84
		Information-related																																							
		Object-related																																							
		Person-related																																							
		Social																																							
		W/o voc.																																							
		Educational attainment																																							
		W/o voc.																																							
		Educational attainment																																							
Branch	Vocational training	12	40	47	54	78	6	36	47	58	87	3	33	45	59	87	12	34	49	67	94	13	40	48	60	86	4	32	58	73	73	19	19	28	94	9	45	57	67	84	
		19	43	49	56	79	8	39	51	61	87	3	33	47	60	87	12	28	47	62	94	13	42	48	60	86	4	45	59	73	73	19	19	28	74	94	9	39	47	59	84
		Upgrading training																																							
		University																																							
Branch	Vocational training	18	48	55	61	80	6	47	58	67	87	3	45	59	73	87	12	34	47	64	94	13	48	48	60	86	4	46	63	73	73	19	28	74	91	94	9	39	46	59	84
		22	38	46	53	77	6	35	46	54	84	3	25	34	53	87	12	34	54	75	94	13	38	49	65	86	4	32	46	59	73	19	19	28	94	9	45	59	70	84	

Sex	13	42	49	56	80	6	39	50	59	87	3	33	45	59	87	12	34	47	67	94	13	40	48	59	86	4	44	59	73	73	19	19	28	74	94	9	45	54	67	84			
Female	12	42	50	58	80	6	39	51	63	87	3	33	47	67	87	12	34	49	67	94	13	43	49	60	86	4	32	58	73	73	19	19	28	85	94	9	43	51	64	84			
Male	17	44	51	58	79	6	40	52	64	87	3	33	45	59	87	12	39	57	75	94	13	44	51	66	86	4	44	59	73	73	19	19	28	74	94	9	45	59	70	84			
Company size	13	42	49	56	79	6	39	50	60	87	3	33	45	62	87	12	34	49	67	94	13	40	48	59	86	4	44	59	73	73	19	19	28	74	94	9	45	53	65	84			
Micro company	21	41	49	56	77	6	38	49	60	87	3	33	47	64	87	12	28	47	66	94	13	40	48	59	86	4	32	58	73	73	19	19	28	85	94	9	41	48	60	84			
Small company	12	42	50	58	80	6	39	50	61	87	3	34	52	67	87	12	28	45	62	94	13	41	48	59	86	4	36	59	73	73	19	19	28	74	94	9	42	53	64	84			
Medium company	Working hours per week																																										
Large company	19	43	50	58	79	6	37	48	60	87	3	31	40	53	87	12	43	62	83	94	13	41	51	66	86	4	46	59	73	73	19	19	28	28	94	9	45	60	74	84			
More than 10 years	21	20	30	17	42	49	56	77	6	38	48	59	87	3	33	45	59	87	12	34	53	68	94	13	38	48	60	86	4	45	59	73	73	19	19	28	74	94	9	45	57	70	84
Up to 10 years	18	42	49	57	80	6	39	50	60	87	3	33	47	64	87	12	34	49	67	94	13	41	48	60	86	4	45	59	73	73	19	19	28	74	94	9	45	54	65	84			
Up to 5 years	31	40	18	42	49	57	80	6	40	51	63	87	3	34	52	67	87	12	28	42	60	94	13	41	48	59	86	4	32	50	63	73	19	19	28	85	94	9	35	45	59	84	
Up to 2 years	12	41	49	57	80	6	40	51	63	87	3	34	52	67	87	12	28	42	60	94	13	41	48	59	86	4	32	50	63	73	19	19	28	74	94	9	42	51	64	84			
ADM knowledge	Length of employment																																										
Basic	25	48	55	62	79	11	47	58	67	87	5	45	59	79	87	12	28	47	62	94	13	48	48	59	86	4	50	63	73	73	19	28	74	91	94	9	39	46	60	84			
Advanced	26	54	60	66	79	16	54	64	72	87	14	53	67	79	87	12	28	47	64	94	13	48	59	66	86	5	50	63	73	73	19	74	85	91	94	9	35	46	64	84			
Knowledge intensity	Changes in the last 2 years																																										
KIS	13	43	51	58	80	6	41	52	63	87	3	34	52	67	87	12	30	47	64	94	13	40	48	59	86	4	36	59	73	73	19	19	28	85	94	9	41	48	64	84			
LKIS	12	40	47	53	79	6	35	46	58	87	3	25	40	53	87	12	34	52	68	94	13	41	48	60	86	4	32	50	59	73	19	19	28	94	9	45	57	70	84				
Changes in the last 2 years	Changes in the last 2 years																																										
Low	13	43	50	57	80	6	39	50	61	87	3	33	45	64	87	12	36	53	68	94	13	41	48	60	86	4	44	59	73	73	19	19	28	85	94	9	45	57	67	84			
Middle	12	42	49	57	79	6	40	50	62	87	3	34	52	67	87	12	28	43	62	94	13	40	48	59	86	4	32	59	73	73	19	19	28	85	94	9	41	48	60	84			
High	19	40	47	55	77	6	39	50	61	87	3	34	47	67	87	12	21	38	56	94	13	40	48	59	86	4	32	50	63	73	19	19	28	85	94	9	36	45	59	84			

Frequency of making difficult decisions																																								
Never	18	41	49	57	80	6	43	53	64	87	3	45	59	68	87	12	28	41	60	94	13	40	48	59	86	4	32	58	73	73	19	19	28	85	94	9	35	45	57	84
Sometimes	12	43	50	57	79	6	38	50	59	87	3	33	45	59	87	12	36	53	67	94	13	41	49	60	86	4	45	59	73	73	19	19	28	85	94	9	45	57	70	84
Frequently	17	42	49	56	80	6	33	42	53	87	3	23	33	45	87	12	43	64	83	94	13	41	52	66	86	4	45	59	73	73	19	19	28	84	9	57	67	78	84	

Source: BIBB/BAuA-ETB 2018 and 2012. Own calculations.

Table 26: Detailed summary statistics of Autonomy Index (w/o Loc), 2018 and 2012

	Autonomy Index (w/o Loc)		Task Autonomy		Method Autonomy		Criteria Autonomy		Scheduling Autonomy		Working Time Autonomy		Interactional Autonomy																						
	Min/p25	p50/p75/Max	Min/p25	p50/p75/Max	Min/p25	p50/p75/Max	Min/p25	p50/p75/Max	Min/p25	p50/p75/Max	Min/p25	p50/p75/Max	Min/p25	p50/p75/Max																					
2018	11	44	51	58	84	6	39	50	61	87	3	33	47	64	87	12	34	47	67	94	13	40	48	60	86	4	36	59	73	73	9	45	53	65	84
2012	17	45	51	58	82	7	40	51	61	87	4	37	49	63	90	12	30	47	67	94	12	40	48	59	86	4	35	60	74	74	8	44	53	65	84

Source: BIBB/BAuA-ETB 2018 and 2012. Own calculations.

Appendix | Part III

Figure 20: Translated interview guideline for context interviews

Guideline for context interviews

Central question of the interview:

The overarching question of this interview is to what extent workers' job autonomy is affected by the use of technical systems of algorithmic decision-making and execution.

What does "job autonomy" mean?

The term "job autonomy" describes all the scope for action and decision-making that workers have in carrying out their work. Exemplary questions are: Can you decide for yourself how a task is to be performed? Can you decide for yourself how quickly these tasks are completed?

Why is it important to deal with job autonomy?

Descriptions of the scope for action and decision-making at work can help to assess what consequences the use of technical systems has for workers. The focus is on the subjective perception of workers' job autonomy. Different forms of job autonomy can provide information about how stressful and intensive work is perceived to be or which motivating and meaningful moments may be released at work.

What are "context interviews"?

The context interviews with executives, IT managers, and work councils serve the purpose of assessing the organizational and technical embedding of algorithmic systems in companies. They form the basic prerequisite for the downstream employee interviews and are intended to map the employee-, employer-, and IT-related perspectives on the technical system to obtain as holistic a picture as possible of how it is perceived in the company. The interviews thus also serve to contextualize the content of the employee interviews.

Block I: Functions of the technical system in the company

- Please describe the functions and places of use of the system in your company.
- What technical support did you use before the introduction of the system, and/or can you describe the non-technical work setting?
- From your point of view, with what objectives was the system introduced in the company?
- What are the advantages (disadvantages) of using the system for the company from your perspective?

Block II: Efforts caused by the system

- What efforts were involved in the implementation and maintenance of the system for your company?
- What technical and organizational hurdles (simplifications) does the system entail?
- With which other technical systems is the algorithmic system networked in your company?
- What data is necessary for the system to function?
- How and by whom is the collected data used?
- How do you assess the functioning of the system?

Block III: Work organization

- Can you describe how the system influences the distribution and planning of work tasks?
- To what extent does the system influence information, communication flows, and cooperation in the company?
- In what way does the system influence the organization of working time and place?
- Does the system set specific work and performance targets? What are they, and who sets them in advance?

Block IV: Influence on employees

- In your view, to what extent has the work of employees changed as a result of using the system?
- Which aspects of employees' work do you consider to be more self-determined (limited) as a result of using the system?
- To what extent do you consider the system to be a relief (burden) for employees?
- What other organizational, social, or economic aspects have an influence on the company apart from the use of technology/digitalization?

Personal information (optional)

- In which year were you born?
- What educational/vocational training have you completed?
- What is your position in the company? / What is your relationship to the company?

- How many hours a week do you work on average?
- How long have you been working in this profession and for this company?

Figure 21: Translated interview guideline for employee interviews

Guideline for employee interviews

Central question of the interview:

The overarching question of this interview is to what extent workers' job autonomy is affected by the use of technical systems of algorithmic decision-making and execution.

What does "job autonomy" mean?

The term "job autonomy" describes all the scope for action and decision-making that workers have in carrying out their work. Exemplary questions are: Can you decide for yourself how a task is to be performed? Can you decide for yourself how quickly these tasks are completed?

Why is it important to deal with job autonomy?

Descriptions of the scope for action and decision-making at work can help to assess what consequences the use of technical systems has for workers. The focus is on the subjective perception of workers' job autonomy. Different forms of job autonomy can provide information about how stressful and intensive work is perceived to be or which motivating and meaningful moments may be released at work.

Block I: Subjective perception of the technical system in everyday work

First of all, it is important for me to learn more about your everyday working routine and how you deal with the system.

- Can you describe your "typical" working day? Situations in which you deal with the system are important here.
- Please explain in a "before and after" view how your work has changed overall since the introduction of the system?
- How do you evaluate the functioning of the system in your everyday work?
- In your opinion, what goals are being pursued with the use of the system?

Block II: Influence on autonomy dimensions

I would now like to know more about how your work has changed in detail through the use of the system. This concerns particular areas in which you

yourself determine the planning and execution of your work and situations in which the system influences your work. The following questions, therefore, always refer to situations in which the system influences your work. We start by looking at what tasks you carry out and how you carry them out.

[Task Autonomy]:

- Can you describe the ways in which the use of the system influences exactly what tasks you perform?
- Does the system influence whether you have all the information you need to do your job?
- To what extent does the use of the system change the amount of work you do?

[Method Autonomy]:

- Can you describe the extent to which you can determine the way (i.e., procedure, method) in which your tasks are performed?
- In which situations does the system give you advice or recommendations on how to do your work?
- Also, can you describe situations where you deviate from the guidance you are given?
- Do you learn anything new when using the system?

Now it is a question of how your work results are evaluated and to what extent you can set and pursue your work goals yourself. It is particularly important what influence the system has on your work goals and assessment of work results.

[Criteria Autonomy]:

- What criteria do you use to evaluate whether you have done your own work well?
- In what way does the system influence these “criteria”?
- To what extent does the system give you certain work or performance goals?
- Are there also situations in which you rely on the system? What are they?

The next questions refer to time- and place-related components of your work, for example, to what extent you determine when, how fast, or where you work. Again, this is about whether the system influences your freedom of choice.

[Scheduling Autonomy]:

- In which situations does the system influence the order or priority in which you complete tasks?
- To what extent can you determine for yourself how quickly you work?
- Can you decide for yourself when to take breaks?
- In what ways does the system influence how you deal with unpredictable situations or interruptions at work?

[Working Time Autonomy]:

- To what extent does the system influence when you start and finish work, and how many hours do you work in total?
- Has there been any change in the need to cover for colleagues and in general in the way you can plan your working hours? Can you describe the aspects in more detail?

[Locational Autonomy]:

- Please describe how the system influences where you do your work. This can include work commutes, time spent at the company site, work travel, or client/client premises.
- Has the use of the system changed anything in the relationship between time spent at work, on the road, or at home?

Now the question is to what extent the cooperation with or relationships with other people in your work environment have changed. These people can be your colleagues and supervisors in the company or the service recipients.

[Interactional Autonomy]:

- Can you describe what aspects of your cooperation with your colleagues or supervisors have changed since you started using the system?
- Can you describe situations where the system influences who you work with, either within the organization or in relation to your clients?
- From your perspective, does your relationship with your clients change as a result of using the systems? In what way?

Block III: Overall assessment

The last questions are about your overall impression of working with the system.

- Do you perceive your work with the system as more self-determined (more restricted) overall?

- Which aspects of your work do you perceive as generally facilitated (more burdened)?
- Apart from the use of technology, which other organizational, economic, or private aspects have an impact on your work and sense of autonomy, i.e., your freedom of action and decision-making?

Personal information (optional)

Finally, I would like to ask you for some personal information. This information will, of course, be treated confidentially.

- In which year were you born?
- What schooling/vocational training have you completed?
- What is your position in the company?
- How many hours a week do you work on average?
- How long have you been working in this profession and for this company?

Figure 22: Translated interview guideline for expert interviews

Brainstorming template for expert interviews

“Algorithmic Decision-Making in Service Work.

An Analysis of Changing Job Autonomy”

= How does the autonomy of employees change as a result of AI use?

Why expert interviews?

Situate selected empirical study results in your field of expertise: From your perspective, what should be considered when using AI in the workplace?

Bottom line:

- Does it contribute to increasing social inequalities? To what extent?
- Can the use of tech contribute to reducing the workload of employees?

RESULTS

Case I | Outpatient care: “We all know how it shouldn’t be.”

The company example uses a hardware and software solution that moves administration, billing tasks, and work planning into the digital space. Tour planning is algorithm-driven. On tour, care documentation is recorded by means of voice input, handovers, and performance and time recording on

networked tablets, via which there is also access to the tour plan and care-relevant information on the clients.

- +/- Accurate recording of working hours/services
- + Requirements of interaction work alleviated
- + Flexibilization of place/time
- + Time savings/reduction of admin. Efforts
- + Standardization/information access

Case II | Banking: “AI just needs to be taught intelligence.”

The company example uses a software solution that largely automates client selection and approaches for advisory activities. This recommendation system suggests clients to bank advisors who would be most likely to purchase a certain product. The probability calculation is based, in particular, on the clients’ transaction data and is intended to replace campaign-based approaches with more needs-oriented approaches.

- +/- Increasing the chances of success/pressure
- + Preservation of adaptable interaction work
- - Higher flexibility demands on advisors
- - Increase in the amount of work
- - Devaluation of experiential knowledge

Conditions for autonomy-promoting tech use:

- The objective of tech-use as a critical path (realization of economic efficiency, control, rationalization, or support?).
- Technical prerequisite: quality of results and functionality are decisive
- Use of technology/reliance on functionality only in combination with experiential knowledge
- (Non-)exploitation of performance-related employee data as an instrument of control
- Interaction work as the core of service work can still be individually shaped

Table 27: Specification of interviews conducted

No.	Interview type	Interviewee/field of expertise	Day	Recording
#1	Context	Executive, company I	14.10.22	1:31:14
#2	Context	Care manager, company I	14.10.22	1:39:00
#3	Context	Technology provider, company I <i>[online]</i>	21.10.22	0:55:21
#4	Employee	Care manager, company I <i>[online]</i>	28.10.22	0:50:17
#5	Employee	Care professional, company I	09.11.22	1:18:45
#6	Employee	Care assistant, company I	09.11.22	0:37:11
#7	Employee	Care professional, company I	10.11.22	0:57:31
#8	Employee	Care professional, company I	10.11.22	1:01:32
#9	Context	Employee representative, company II	20.04.23	1:42:31
#10	Context	Middle management, company II	20.04.23	1:05:21
#11	Context	Middle management, sales, company II	25.05.23	1:20:32
#12	Employee	Branch manager, bank advisor, company II	23.06.23	1:07:16
#13	Context	Technology expert, sales, company II	23.06.23	1:08:22
#14	Employee	Bank advisor, company II	11.07.23	1:13:32
#15	Employee	Bank advisor, company II <i>[online]</i>	18.07.23	0:47:30
#16	Employee	Bank advisor, company II <i>[online]</i>	24.07.23	0:53:35
#17	Expert	Public policy, regulation <i>[online]</i>	22.06.23	0:48:09
#18	Expert	Occupational safety, standardization <i>[online]</i>	26.06.23	0:55:39
#19	Expert	Research funding, care technologies <i>[online]</i>	27.06.23	0:54:44
#20	Expert	Labor law, employee participation <i>[online]</i>	10.07.23	0:54:33
				∅ 1:05:08
				Σ 21:42:35

References

- Acemoglu, D. (2021). *Harms of AI* (NBER Working Paper No. 29247). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w29247>
- Acemoglu, D., & Restrepo, P. (2018). *Artificial Intelligence, Automation and Work* (NBER Working Paper No. 24196). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w24196>
- Acemoglu, D., & Restrepo, P. (2019). *Automation and New Tasks: How Technology Displaces and Reinstates Labor* (NBER Working Paper No. 25684). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w25684>
- Ada Lovelace Institute. (2022). *Inform, educate, entertain... and recommend? Exploring the use and ethics of recommendation systems in public service media*. <https://www.adalovelaceinstitute.org/wp-content/uploads/2022/11/Ada-Lovelace-Institute-Inform-Educate-Entertain...and-Recommend-Nov-2022.pdf>
- Adler, M. A. (1993). Gender Differences in Job Autonomy: The Consequences of Occupational Segregation and Authority Position. *The Sociological Quarterly*, 34(3), 449–465. <https://doi.org/10.1111/j.1533-8525.1993.tb00121.x>
- Aghion, P., Jones, B., & Jones, C. I. (2017). *Artificial Intelligence and Economic Growth* (NBER Working Paper No. 23928). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w23928>
- Agrawal, A., Gans, J., & Goldfarb, A. (2018). *Prediction Machines: The Simple Economics of Artificial Intelligence*. Harvard Business Review Press.
- Ahlers, E. (2018). *Die Digitalisierung der Arbeit: Verbreitung und Einschätzung aus Sicht der Betriebsräte* (Report Nr. 40). Wirtschafts- und Sozialwissenschaftliches Institut (WSI). https://www.boeckler.de/pdf/p_wsi_report_40_2018.pdf
- Ahlers, E., van Berk, B., Maschke, M., Schietinger, M., Schildmann, C., & Schulze Buschoff, K. (2018). *Digitalisierung: Dienstleistungsarbeit im Visier: Was bedeutet Digitalisierung für Tätigkeiten im Bereich von Wissensarbeit und Dienstleistungen?* (Arbeitspapier Nummer 312). Hans-Böckler-Stiftung (HBS). https://www.boeckler.de/pdf/p_arbp_312.pdf
- Algorithm Accountability Lab. (n.d.). Retrieved November 30, 2023, from <https://aalab.cs.uni-kl.de/resources/>
- AlgorithmWatch. (2016, May 12). 1. *Arbeitspapier: Was ist ein Algorithmus?* <https://algorithmwatch.org/de/arbeitspapier-was-ist-ein-algorithmus/>
- AlgorithmWatch. (2019). *Atlas der Automatisierung: Automatisierte Entscheidungen und Teilhabe in Deutschland*. https://atlas.algorithmwatch.org/wp-content/uploads/2019/07/Atlas_der_Automatisierung_von_AlgorithmWatch.pdf

- Alioth, A. (1980). *Entwicklung und Einführung alternativer Arbeitsformen. Schriften zur Arbeitspsychologie: Nr. 27.* Huber Verlag.
- Alpaydin, E. (2016). *Machine Learning: The New AI. The MIT Press Essential Knowledge Series.* The MIT Press.
- Altmann, N. (1978). *Betrieb, Technik, Arbeit: Elemente einer soziologischen Analytik technisch-organisatorischer Veränderungen* (2nd ed.). *Forschungsberichte aus dem Institut für Sozialwissenschaftliche Forschung e.V. München.* Campus-Verlag.
- Altmann, N., Binkelmann, P., Düll, K., & Stück, H. (1982). *Grenzen neuer Arbeitsformen: Betriebliche Arbeitsstrukturierung, Einschätzung durch Industriearbeiter, Beteiligung der Betriebsräte. Arbeiten des Instituts für sozialwissenschaftliche Forschungen e.V., München.* Campus-Verlag.
- André, E., Aurich, J. C., Bauer, W., Bullinger-Hoffmann, A., Heister, M., Huchler, N., Neuburger, R., Peissner, M., Stich, A., & Suchy, O. (2021). *Kompetenzentwicklung für KI: Veränderungen, Bedarfe und Handlungsoptionen* (Whitepaper). Lernende Systeme – Die Plattform für Künstliche Intelligenz. https://www.plattform-lernende-systeme.de/files/Downloads/Publikationen/AG2_WP_Kompetenzentwicklung_KI.pdf
- Autor, D. (2014). *Polanyi's Paradox and the Shape of Employment Growth* (NBER Working Paper No. 20485). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w20485>
- Autor, D. (2015). Why Are There Still So Many Jobs? The History and Future of Workplace Automation. *The Journal of Economic Perspectives*, 29(3), 3–30. <https://doi.org/10.1257/jep.29.3.3>
- Autor, D., Levy, F., & Murnane, R. J. (2003). The Skill Content of Recent Technological Change: An Empirical Exploration. *The Quarterly Journal of Economics*, 118(4), 1279–1333. <https://doi.org/10.1162/0033553033322552801>
- Bäcker, G., Naegele, G., & Bispinck, R. (2020). *Sozialpolitik und soziale Lage in Deutschland: Ein Handbuch* (6th ed.). Springer VS.
- Backhaus, N. (2022). Working Time Control and Variability in Europe Revisited: Correlations with Health, Sleep, and Well-Being. *International Journal of Environmental Research and Public Health*, 19(22), 14778. <https://doi.org/10.3390/ijerph192214778>
- Bainbridge, L. (1983). Ironies of automation. *Automatica*, 19(6), 775–779. [https://doi.org/10.1016/0005-1098\(83\)90046-8](https://doi.org/10.1016/0005-1098(83)90046-8)
- Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources model: state of the art. *Journal of Managerial Psychology*, 22(3), 309–328. <https://doi.org/10.1108/02683940710733115>
- Bakker, A. B., Demerouti, E., Boer, E. de, & Schaufeli, W. B. (2003). Job demands and job resources as predictors of absence duration and frequency. *Journal of Vocational Behavior*, 62(2), 341–356. [https://doi.org/10.1016/S0001-8791\(02\)00030-1](https://doi.org/10.1016/S0001-8791(02)00030-1)

- Baltes, B. B., Bauer, C. C., Bajdo, L. M., & Parker, C. P. (2002). The Use of Multitrait–Multimethod Data for Detecting Nonlinear Relationships: The Case of Psychological Climate and Job Satisfaction. *Journal of Business and Psychology*, 17(1), 3–17. <https://doi.org/10.1023/A:1016231816394>
- Barthel, G. (2023). *Amazonismus. Management im digitalen Kapitalismus* (IAQ-Report 2023|06). Institut Arbeit und Qualifikation (IAQ). https://duepublico2.uni-due.de/receive/duepublico_mods_00078750
- Battistelli, A., Montani, F., & Odoardi, C. (2013). The impact of feedback from job and task autonomy in the relationship between dispositional resistance to change and innovative work behaviour. *European Journal of Work and Organizational Psychology*, 22(1), 26–41. <https://doi.org/10.1080/1359432X.2011.616653>
- Bauer, K., Pfeuffer, N., Abdel-Karim, B., Hinz, O., & Kosfeld, M. (2020). *The Terminator of Social Welfare? The Economic Consequences of Algorithmic Discrimination* (SAFE Working Paper No. 287). Leibniz Institute for Financial Research (SAFE). <https://www.econstor.eu/handle/10419/224058>
- Baumol, W. J. (1967). Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis. *American Economic Review*, 57(3), 415–426. <http://www.jstor.org/stable/1812111>
- Beer, S. (1963). *Kybernetik und Management* (4th ed.). Fischer.
- Beermann, B., Backhaus, N., Tisch, A., & Brenscheidt, F. (2019). *Arbeitswissenschaftliche Erkenntnisse zu Arbeitszeit und gesundheitlichen Auswirkungen* (baua: Fokus). Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). <https://www.baua.de/DE/Angebote/Publicationen/Fokus/Arbeitszeiten.html>
- Beier, N., Stradtman, F., Fischer, C., & Ottenstein, S. (2016). *Kooperation statt Konfrontation: Wie können sich Banken langfristig im FinTech Wettbewerb behaupten?* Accenture (Ed.). <https://docplayer.org/32944895-Kooperation-statt-konfrontation-wie-koennen-sich-banken-langfristig-im-fintech-wettbewerb-behaupten.html>
- Bessen, J. E. (2019). Automation and jobs: when technology boosts employment. *Economic Policy*, 34(100), 589–626. <https://doi.org/10.1093/epolic/eiaa001>
- Beuschel, W. (1995). Expertensysteme im Betrieb: Fallstudien in den USA zu Auswirkungen auf Arbeitsorganisation und Qualifikation. In W. Rammert (Ed.), *Soziologie und künstliche Intelligenz: Produkte und Probleme einer Hochtechnologie* (pp. 299–333). Campus-Verlag.
- Bitkom. (2022, September 13). *KI gilt in der deutschen Wirtschaft als Zukunftstechnologie – wird aber selten genutzt* [Press release]. Berlin. https://www.bitkom.org/Presse/Presseinformation/Kuenstliche-Intelligenz-2022#_
- Bleses, P., Busse, B., Friemer, A., Kludig, R., Breuer, J., Philippi, L., Bidmon-Berezinski, J., & Schnäpp, M. (2018). *Verbundprojekt KOLEGE – Interagieren, koordinieren und lernen: Chancen und Herausforderungen der Digitalisierung in der ambulanten Pflege. Zwischenbericht – Ergebnisse der Anal-*

- ysephase (Schriftenreihe Institut Arbeit und Wirtschaft No.24/2018). Institut Arbeit und Wirtschaft (IAW). Universität Bremen. Arbeitnehmerkammer Bremen. <https://www.econstor.eu/bitstream/10419/179718/1/1024455408.pdf>
- Böhle, F., & Weihrich, M. (2020). Das Konzept der Interaktionsarbeit. *Zeitschrift Für Arbeitswissenschaft*, 74, 9–22. <https://doi.org/10.1007/s41449-020-00190-2>
- Bonin, H., Gregory, T., & Zierahn, U. (2015). *Übertragung der Studie von Frey/Osborne (2013) auf Deutschland: Endbericht an das BMAS* (Kurzexpertise Nr. 57). Leibniz-Zentrum für Europäische Wirtschaftsforschung (ZEW). https://ftp.zew.de/pub/zew-docs/gutachten/Kurzexpertise_BMAS_ZEW2015.pdf
- Boyd, R., & Holton, R. J. (2018). Technology, innovation, employment and power: Does robotics and artificial intelligence really mean social transformation? *Journal of Sociology*, 54(3), 331–345. <https://doi.org/10.1177/1440783317726591>
- Braeseke, G., Kulas, H., Pflug, C., Pörschmann-Schreiber, U., Tisch, T., & Wentz, L. (2020). *Umfrage zum Technikeinsatz in Pflegeeinrichtungen (UTiP): Sachbericht für das Bundesministerium für Gesundheit*. IGES Institut. https://www.bundesgesundheitsministerium.de/fileadmin/Dateien/5_Publikationen/Pflege/Berichte/2020-06-26_IGES_UTiP_Sachbericht.pdf
- Braeseke, G., Meyer-Rötz, S. H., Pflug, C., & Haaß, F. (2017). *Digitalisierung in der ambulanten Pflege – Chancen und Hemmnisse: Kurzfassung*. IGES Institut. https://www.bmwk.de/Redaktion/DE/Publikationen/Studien/digitalisierung-in-der-ambulanten-pflege-chancen-und-hemmnisse.pdf?__blob=publicationFile&v=1
- Braverman, H. (1974). *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century*. Monthly Review Press.
- Breaugh, J. A. (1985). The Measurement of Work Autonomy. *Human Relations*, 38(6), 551–570. <https://doi.org/10.1177/001872678503800604>
- Breaugh, J. A. (1989). The Work Autonomy Scales: Additional Validity Evidence. *Human Relations*, 42(11), 1033–1056. <https://doi.org/10.1177/001872678904201105>
- Breisig, T., König, S., Rehling, M., & Ebeling, M. (2010). “Sie müssen es nicht verstehen, Sie müssen es nur verkaufen!”: *Vertriebssteuerung in Banken* (1st ed.). *Forschung aus der Hans-Böckler-Stiftung: Vol. 119*. edition sigma in der Nomos Verlagsgesellschaft.
- Brenke, K. (2016). Home Office: Möglichkeiten werden bei weitem nicht ausgeschöpft. *DIW Wochenbericht*, 83(5), 95–106. https://www.diw.de/documents/publikationen/73/diw_01.c.526036.de/16-5.pdf
- Brödner, P. (2019). Grenzen und Widersprüche der Entwicklung und Anwendung ‘Autonomer Systeme’. In H. Hirsch-Kreinsen & A. Karačić (Eds.), *Autonome Systeme und Arbeit: Perspektiven, Herausforderungen und Grenzen der Künstlichen Intelligenz in der Arbeitswelt* (pp. 69–97). transcript Verlag.

- Brown, P. (2011). *The Global Auction: The Broken Promises of Education, Jobs and Incomes*. Oxford University Press.
- Brühl, V. (2017). Banking 4.0 – Strategische Herausforderungen im digitalen Zeitalter. In V. Brühl & J. Dorschel (Eds.), *Praxishandbuch Digital Banking* (pp. 3–12). Springer Gabler.
- Brynjolfsson, E., Li, D., & Raymond, L. (2023). *Generative AI at Work* (NBER Working Paper No. 31161). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w31161>
- Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. W. W. Norton & Company.
- Brynjolfsson, E., Mitchell, T., & Rock, D. (2018). What Can Machines Learn, and What Does It Mean for Occupations and the Economy? *AEA Papers and Proceedings*, 108, 43–47. <https://doi.org/10.1257/pandp.20181019>
- Bryson, J. J., & Malikova, H. (2021). Is There an AI Cold War? *Global Perspectives*, 2(1), Article 24803. <https://doi.org/10.1525/gp.2021.24803>
- Buch, C. M. (2018, September 3). *Wettbewerb und Stabilität im Finanzsektor in Zeiten technologischen Wandels: Rede anlässlich des Empfangs des Deutschen Instituts für Wirtschaftsforschung (DIW) bei der Jahrestagung des Vereins für Socialpolitik*. Verein für Socialpolitik, Freiburg im Breisgau. <https://www.bundesbank.de/resource/blob/758264/9ce369300f6411bb347ddd14b8a11621/mL/2018-09-03-buch-download.pdf>
- Büchel, J., Demary, V., Goecke, H., Kohlich, E., Koppel, O., Mertens, A., Rusche, C., Scheufen, M., & Wendt, J. (2021). *KI-Monitor 2021: Status quo der Künstlichen Intelligenz in Deutschland*. Gutachten. Bundesverband Digitale Wirtschaft e.V. (BVDW). https://www.iwkoeln.de/fileadmin/user_upload/Studien/Gutachten/PDF/2021/KI_Monitor_Bericht_2021.pdf
- Bundesagentur für Arbeit. (2019, July 10). *Beschäftigte nach Wirtschaftszweigen (WZ 2008): Deutschland, West/Ost und Länder (Quartalszahlen)*. 31. Dezember 2018. https://statistik.arbeitsagentur.de/Statistikdaten/Detail/201812/iiia6/beschaeftigung-sozbe-wz-heft/wz-heft-d-0-201812-xlsx.xlsx?__blob=publicationFile&v=1
- Bundesagentur für Arbeit (BA). (2021). *Klassifikation der Berufe 2010 – überarbeitete Fassung 2020: Band 1: Systematischer und alphabetischer Teil mit Erläuterungen*. https://statistik.arbeitsagentur.de/DE/Statischer-Content/Grundlagen/Klassifikationen/Klassifikation-der-Berufe/KldB2010-Fassung2020/Printausgabe-KldB-2010-Fassung2020/Generische-Publikationen/KldB2010-PDF-Version-Band1-Fassung2020.pdf;jsessionid=D6AC665F33577B3793CBAB44439051D8?__blob=publicationFile&v=22
- Bundesagentur für Arbeit (BA). (2023a). *Arbeitsmarktsituation im Pflegebereich* (Berichte: Blickpunkt Arbeitsmarkt). https://statistik.arbeitsagentur.de/DE/Statischer-Content/Statistiken/Themen-im-Fokus/Berufe/Generische-Publikationen/Altenpflege.pdf?__blob=publicationFile&v=15

- Bundesagentur für Arbeit. (2023b, July 17). *Beschäftigte nach Wirtschaftszweigen (WZ 2008): Deutschland, West/Ost und Länder (Quartalszahlen)*. 31. Dezember 2022. https://statistik.arbeitsagentur.de/Statistikdaten/Detail/202212/iiia6/beschaeftigung-sozbe-wz-heft/wz-heft-d-0-202212-xlsx.xlsx?__blob=publicationFile&v=1
- Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin). (2018). *Big Data trifft auf künstliche Intelligenz: Herausforderungen und Implikationen für Aufsicht und Regulierung von Finanzdienstleistungen*. https://www.bafin.de/SharedDocs/Downloads/DE/dl_bdai_studie.pdf;jsessionid=4A8E35D4AA43BDDFBFF1C4F817B62ECB.internet971?__blob=publicationFile&v=2
- Bundesministerium für Familie, Senioren, Frauen und Jugend (BMFSFJ). (2021). *Dritter Gleichstellungsbericht: Digitalisierung geschlechtergerecht gestalten*. <https://www.bmfsfj.de/resource/blob/184544/c0d592d2c37e7e2b5b4612379453e9f4/dritter-gleichstellungsbericht-bundestagsdrucksache-data.pdf>
- Bundesministerium für Gesundheit. (2023, September 19). *Pflegedienst und Pflegesachleistungen*. <https://www.bundesgesundheitsministerium.de/pflegedienst-und-pflegesachleistungen.html>
- Bundesministerium für Gesundheit (BMG). (2024). *Zahlen und Fakten zur Pflegeversicherung*. https://www.bundesgesundheitsministerium.de/fileadmin/Dateien/3_Downloads/Statistiken/Pflegeversicherung/Zahlen_und_Fakten/Zahlen-Fakten_Pflegeversicherung.pdf
- Bundesministerium für Wirtschaft und Energie (BMWi). (2018). *Monitoring-Report Wirtschaft DIGITAL 2018*. https://www.bmwk.de/Redaktion/DE/Publikationen/Digitale-Welt/monitoring-report-wirtschaft-digital-2018-langfassung.pdf?__blob=publicationFile&v=1
- Bundesministerium für Wirtschaft und Energie (BMWi). (2020). *Einsatz von Künstlicher Intelligenz in der Deutschen Wirtschaft: Stand der KI-Nutzung im Jahr 2019*. https://www.bmwk.de/Redaktion/DE/Publikationen/Wirtschaft/einsatz-von-ki-deutsche-wirtschaft.pdf?__blob=publicationFile&v=1
- Bundesverband Informationswirtschaft, Telekommunikation und neue Medien e.V. (Bitkom). (2017). *Künstliche Intelligenz verstehen als Automation des Entscheidens: Leitfaden*. <https://www.bitkom.org/sites/main/files/file/import/Bitkom-Leitfaden-KI-verstehen-als-Automation-des-Entscheidens-2-Mai-2017.pdf>
- Bundeszentrale für politische Bildung (Ed.). (2011). *Aus Politik und Zeitgeschichte (APuZ): 15/2011. Humanisierung der Arbeit*.
- Burawoy, M. (1979). *Manufacturing Consent: Changes in the Labor Process Under the Monopoly Capitalism*. University of Chicago Press.
- Burkert, C. (2019). *Strukturwandel und Beschäftigungsentwicklung in der Finanzbranche in Deutschland* (IAB-Stellungnahme 5|2019). Institut für Arbeitsmarkt- und Berufsforschung (IAB). <https://doku.iab.de/stellungnahme/2019/sn0519.pdf>

- Büssing, A., & Glaser, J. (1998). Arbeitszeit und neue Organisations- und Beschäftigungsformen: zum Spannungsverhältnis von Flexibilität und Autonomie. *Mitteilungen Aus Der Arbeitsmarkt- Und Berufsforschung*, 31(3), 585–598. <https://core.ac.uk/download/pdf/6765401.pdf>
- Butollo, F., Engel, T., Füchtenkötter, M., Koepp, R., & Ottaiano, M. (2018). Wie stabil ist der digitale Taylorismus? Störungsbehebung, Prozessverbesserungen und Beschäftigungssystem bei einem Unternehmen des Online-Versandhandels. *Arbeits- und Industriesoziologische Studien*, 11(2), 143–159. <https://doi.org/10.21241/ssoar.64868>
- Butollo, F., Jürgens, U., & Krzywdzinski, M. (2018). Von Lean Production zur Industrie 4.0. Mehr Autonomie für die Beschäftigten? *Arbeits- Und Industriesoziologische Studien*, 11(2), 75–90. <https://doi.org/10.21241/ssoar.64864>
- Carayon, P. (2006). Human factors of complex sociotechnical systems. *Applied Ergonomics*, 37(4), 525–535. <https://doi.org/10.1016/j.apergo.2006.04.011>
- Carayon, P., & Zijlstra, F. (1999). Relationship between job control, work pressure and strain: Studies in the USA and in The Netherlands. *Work & Stress*, 13(1), 32–48. <https://doi.org/10.1080/026783799296174>
- Castelluccia, C., & Le Métayer, D. (2019). *Understanding algorithmic decision-making: Opportunities and challenges*. European Union (EU). European Parliamentary Research Service (EPRS). [https://www.europarl.europa.eu/Reg-Data/etudes/STUD/2019/624261/EPRS_STU\(2019\)624261_EN.pdf](https://www.europarl.europa.eu/Reg-Data/etudes/STUD/2019/624261/EPRS_STU(2019)624261_EN.pdf)
- Chang, J. W., Huang, D. W., & Choi, J. N. (2012). Is Task Autonomy Beneficial for Creativity? Prior Task Experience and Self-Control as Boundary Conditions. *Social Behavior and Personality*, 40(5), 705–724. <https://doi.org/10.2224/sbp.2012.40.5.705>
- Claessens, B. J. C., van Eerde, W., Rutte, C. G., & Roe, R. A. (2004). Planning behavior and perceived control of time at work. *Journal of Organizational Behavior*, 25(8), 937–950. <https://doi.org/10.1002/job.292>
- Cockburn, I., Henderson, R., & Stern, S. (2018). *The Impact of Artificial Intelligence on Innovation* (NBER Working Paper No. 24449). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w24449>
- Crawford, K. (2021). *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence*. Yale University Press.
- Cummings, T. G., & Molloy, E. S. (1977). *Improving Productivity and the Quality of Work Life*. Praeger Publishers.
- Daugherty, P. R., & Wilson, H. J. (2018). *Human + Machine: Reimagining Work in the Age of AI*. Harvard Business Review Press.
- Daum, M. (2017). *Digitalisierung und Technisierung der Pflege in Deutschland: Aktuelle Trends und ihre Folgewirkungen auf Arbeitsorganisation, Beschäftigung und Qualifizierung*. DAA-Stiftung Bildung und Beruf. https://www.daa-stiftung.de/fileadmin/user_upload/digitalisierung_und_technisierung_der_pflege_2.pdf

- DeCotils, T. A., & Koys, D. J. (1980). The Identification and Measurement of the Dimensions of Organizational Climate. *Academy of Management Proceedings*(1), 171–175. <https://doi.org/10.5465/ambpp.1980.4976195>
- Delfanti, A. (2021). Machinic dispossession and augmented despotism: Digital work in an Amazon warehouse. *New Media & Society*, 23(1), 39–55. <https://doi.org/10.1177/1461444819891613>
- Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The Job Demands–Resources Model of Burnout. *The Journal of Applied Psychology*, 86(3), 499–512. <https://doi.org/10.1037/0021-9010.86.3.499>
- Deming, D. J. (2021). *The Growing Importance of Decision-Making on the Job* (NBER Working Paper No.28733). National Bureau of Economic Research (NBER). https://www.nber.org/system/files/working_papers/w28733/w28733.pdf
- Den Hartog, D. N., & Belschak, F. D. (2012). When does transformational leadership enhance employee proactive behavior? The role of autonomy and role breadth self-efficacy. *The Journal of Applied Psychology*, 97(1), 194–202. <https://doi.org/10.1037/a0024903>
- Dengler, K., & Matthes, B. (2021). *Auch komplexere Tätigkeiten könnten zunehmend automatisiert werden: Folgen des technologischen Wandels für den Arbeitsmarkt* (IAB-Kurzbericht 13|2021). Institut für Arbeitsmarkt- und Berufsforschung (IAB). <https://doku.iab.de/kurzber/2021/kb2021-13.pdf>
- Dengler, K., Matthes, B., & Paulus, W. (2014). *Berufliche Tasks auf dem deutschen Arbeitsmarkt: Eine alternative Messung auf Basis einer Expertendatenbank* (FDZ-Methodenreport 12/2014). Forschungsdatenzentrum (FDZ) der Bundesagentur für Arbeit im Institut für Arbeitsmarkt- und Berufsforschung (IAB). http://doku.iab.de/fdz/reporte/2014/MR_12-14.pdf
- Deutscher Bundestag (Ed.). (2020). *Bericht der Enquete-Kommission Künstliche Intelligenz – Gesellschaftliche Verantwortung und wirtschaftliche, soziale und ökologische Potenziale* (Drucksache 19/23700). <https://dserv.bundestag.de/btd/19/237/1923700.pdf>
- Deutscher Gewerkschaftsbund (DGB); Hans-Böckler-Stiftung (HBS). (2022). *Atlas der digitalen Arbeit: Daten und Fakten über die Beschäftigung der Zukunft*. <https://www.boeckler.de/de/auf-einen-blick-17945-atlas-der-digitalen-arbeit-2022-40799.htm>
- Dowling, E. (2021). *The Care Crisis: What Caused It and How Can We End It?* Verso.
- Dütsch, M., & Bruttel, O. (2021). *Cumulative risks in a segmented labour market: Working-time patterns of low-wage workers* (baua: Fokus). Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). https://www.baua.de/DE/Angebote/Publicationen/Fokus/Low-wage-workers.pdf?__blob=publicationFile&v=3
- Dysvik, A., & Kuvaas, B. (2013). Perceived job autonomy and turnover intention: The moderating role of perceived supervisor support. *European Journal*

- of *Work and Organizational Psychology*, 22(5), 563–573. <https://doi.org/10.1080/1359432X.2012.667215>
- The Economist. (2015). *Digital Taylorism: A modern version of “scientific management” threatens to dehumanise the workplace*. <https://www.economist.com/business/2015/09/10/digital-taylorism>
- Edwards, R. (1979). *Contested Terrain: The Transformation of the Workplace in the Twentieth Century*. Basic Books.
- Ernst, E., Merola, R., & Samaan, D. (2018). *The economics of artificial intelligence: Implications for the future of work* (ILO Future of Work Research Paper Series). International Labour Organization (ILO). https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_647306.pdf
- Esser, I., & Olsen, K. M. (2012). Perceived Job Quality: Autonomy and Job Security within a Multi-Level Framework. *European Sociological Review*, 28(4), 443–454. <https://doi.org/10.1093/esr/jcr009>
- European Commission (EC). (2018). *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: Artificial Intelligence for Europe* (COM(2018) 237 final). <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0237>
- Eurostat. (2016, October 31). *Unternehmensgröße*. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Enterprise_size/de
- Evans, M., Hielscher, V., & Voss, D. (2018). *Damit Arbeit 4.0 in der Pflege ankommt: Wie Technik die Pflege stärken kann* (Policy Brief Nr.004). Hans-Böckler-Stiftung (HBS). https://www.boeckler.de/pdf/p_fofoe_pb_004_2018.pdf
- Eyert, F., Irgmaier, F., & Ulbricht, L. (2020). Extending the framework of algorithmic regulation. The Uber case. *Regulation & Governance*, 16(1), 23–44. <https://doi.org/10.1111/rego.12371>
- Felten, E. W., Raj, M., & Seamans, R. (2019). *The Occupational Impact of Artificial Intelligence: Labor, Skills, and Polarization*. NYU Stern School of Business. https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID3454951_code2763040.pdf?abstractid=3368605&mirid=1
- Financial Stability Board (FSB). (2017). *Artificial intelligence and machine learning in financial services Market developments and financial stability implications*. <https://www.fsb.org/wp-content/uploads/P011117.pdf>
- Fischer, S., & Puschmann, C. (2021). *Wie Deutschland über Algorithmen schreibt*. Bertelsmann Stiftung. https://www.bertelsmann-stiftung.de/fileadmin/files/user_upload/Diskursanalyse_2021_Algorithmen.pdf
- Fleming, M., Clarke, W., Das, S., Phongthientham, P., & Reddy, P. (2019). *The Future of Work: How New Technologies Are Transforming Tasks*. MIT-IBM Watson AI Lab. <https://mitibmwatsonailab.mit.edu/wp-content/uploads/2019/>

- 10/The-Future-of-Work-How-New-Technologies-Are-Transforming-Tasks2.pdf
- Ford, M. (2016). *The Rise of the Robots: Technology and the Threat of Mass Unemployment*. Oneworld Publications.
- Ford, M. (2018). *Architects of Intelligence: The truth about AI from the people building it*. Packt Publishing.
- Franzen, M., Jung, A., Kaldewey, D., & Korte, J. (2014). Begriff und Wert der Autonomie in Wissenschaft, Kunst und Politik: Eine Einleitung. In M. Franzen, A. Jung, D. Kaldewey, & J. Korte (Eds.), *Zeitschrift für Theoretische Soziologie: 2. Sonderband. Autonomie revisited: Beiträge zu einem umstrittenen Grundbegriff in Wissenschaft, Kunst und Politik* (pp. 5–16). Beltz Juventa.
- Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation? *Technological Forecasting and Social Change*, 114, 254–280. <https://doi.org/10.1016/j.techfore.2016.08.019>
- Frey, M. (2004). Ist der “Arbeitskraftunternehmer” weiblich? *Arbeit*, 13(1), 61–77. <https://doi.org/10.1515/arbeits-2004-0106>
- Frey, M. (2009). *Autonomie und Aneignung in der Arbeit: Eine soziologische Untersuchung zur Vermarktlichung und Subjektivierung von Arbeit. Arbeit und Leben im Umbruch. Schriftenreihe zur subjektorientierten Soziologie der Arbeit und der Arbeitsgesellschaft: Vol. 18*. Rainer Hampp Verlag.
- Friedman, A. L. (1977a). *Industry and Labour: Class Struggle at Work and Monopoly Capitalism* (1st ed.). Palgrave Macmillan.
- Friedman, A. L. (1977b). Responsible Autonomy Versus Direct Control Over the Labour Process. *Capital & Class*, 1(1), 43–57. <https://doi.org/10.1177/030981687700100104>
- Friedrich, L., Hiese, A., Dreßler, R., & Wolfenstetter, F. (2021). Künstliche Intelligenz in Banken – Status quo, Herausforderungen und Anwendungspotenziale. In P. Buxmann & H. Schmidt (Eds.), *Künstliche Intelligenz: Mit Algorithmen zum wirtschaftlichen Erfolg* (2nd ed., pp. 49–63). Springer Gabler.
- Frontier Economics. (2018). *The Impact of Artificial Intelligence on Work: An evidence review prepared for the Royal Society and the British Academy*. <https://royalsociety.org/-/media/policy/projects/ai-and-work/frontier-review-the-impact-of-AI-on-work.pdf>
- Fuchs-Frohnhofer, P., Bogert, B., Palm, G., & Kerger, K. (2017). *Anwendungschancen moderner IT- und AAL-Technik für stationäre Pflegeeinrichtungen: Forschungsbericht des ArWiso e.V., Würselen und der St. Gereon Senioren Dienste, Hückelhoven*. MA & T Sell & Partner.
- Fuller, J. B., Hester, K., & Cox, S. S. (2010). Proactive Personality and Job Performance: Exploring Job Autonomy as a Moderator. *Journal of Managerial Issues*, 22(1), 35–51. <http://www.jstor.org/stable/25822514>
- Gagné, M., & Bhawe, D. (2011). Autonomy in the Workplace: An Essential Ingredient to Employee Engagement and Well-Being in Every Culture. In V. I.

- Chirkov, R. M. Ryan, & K. M. Sheldon (Eds.), *Cross-Cultural Advancements in Positive Psychology. Human Autonomy in Cross-Cultural Context: Perspectives on the Psychology of Agency, Freedom, and Well-Being* (pp. 163–187). Springer.
- Gagné, M., Parker, S. K., Griffin, M. A., Dunlop, P. D., Knight, C., Klonek, F. E., & Parent-Rochelleau, X. (2022). Understanding and shaping the future of work with self-determination theory. *Nature Reviews Psychology*, 1, 378–392. <https://doi.org/10.1038/s44159-022-00056-w>
- Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about telecommuting: Meta-analysis of psychological mediators and individual consequences. *The Journal of Applied Psychology*, 92(6), 1524–1541. <https://doi.org/10.1037/0021-9010.92.6.1524>
- Gautié, J., Jaehrling, K., & Perez, C. (2020). Neo-Taylorism in the Digital Age: Workplace Transformations in French and German Retail Warehouses. *Industrial Relations*, 75(4), 774–795. <https://www.jstor.org/stable/27016459>
- Gensicke, M., & Tschersich, N. (2018). *BIBB/BAuA-Erwerbstätigenbefragung 2018: Methodenbericht*. Kantar Public. https://www.bibb.de/dokumente/pdf/a12_kantar_methodenbericht_etb1718_final.pdf
- Gensicke, M., Tschersich, N., & Hartmann, J. (2012). *BIBB/BAuA-Erwerbstätigenbefragung 2011/2012: Strukturkontrolle, Steuerung und Gewichtung der Stichprobe*. TNS Infratest Sozialforschung (Ed.). https://www.bibb.de/dokumente/pdf/a22_etb12_methodenberichte_04Gewichtungsbericht_Los__1.pdf
- Gensler, E., & Abendroth, A.-K. (2021). Verstärkt algorithmische Arbeitsteuerung Ungleichheiten in Arbeitsautonomie? Eine empirische Untersuchung von Beschäftigten in großen deutschen Arbeitsorganisationen. *Soziale Welt*, 72(4), 514–550. <https://doi.org/10.5771/0038-6073-2021-4-514>
- Georg, A., & Guhlemann, K. (2020). *HDA RELOADED? Lehren aus der “Humanisierungsdebatte” für die Gestaltung digitalisierter Arbeit* (WSI Study No. 23). Wirtschafts- und Sozialwissenschaftliches Institut (WSI). https://www.boeckler.de/fpdf/HBS-007912/p_wsi_studies_23_2020.pdf
- Geric, J. (2019). Out of control: Arbeitszeitbezogene Handlungsautonomie als salutogene Bedingung oder Gesundheitsrisiko? In M. Griesbacher, J. Hödl, J. Muckenhuber, & K. Scaria-Braunstein (Eds.), *Intensivierung der Arbeit: Perspektiven auf Arbeitszeit und technologischen Wandel* (pp. 87–100). new academic press.
- Gerold, S., Gruszka, K., Pillinger, A., & Theine, H. (2022). *Putzkraft aus dem Netz: Perspektiven und Erfahrungen von Reinigungskräften in der plattformvermittelten Haushaltsreinigung* (Working Paper Forschungsförderung Nummer 259). Hans-Böckler-Stiftung (HBS). https://www.boeckler.de/fpdf/HBS-008478/p_fofoe_WP_259_2022.pdf
- Gerst, D. (2002). *Wandel betrieblicher Kontrollpraktiken im Lichte einer post-strukturalistischen Machtanalytik* (SOFI-Mitteilungen No. 30). Soziologisches

- Forschungsinstitut Göttingen (SOFI). https://sofi.uni-goettingen.de/fileadmin/Publikationen/SOFI-Mitteilungen_30_gerst.pdf
- Gerst, D. (2019). Autonome Systeme und Künstliche Intelligenz: Herausforderungen für die Arbeitssystemgestaltung. In H. Hirsch-Kreinsen & A. Karačić (Eds.), *Autonome Systeme und Arbeit: Perspektiven, Herausforderungen und Grenzen der Künstlichen Intelligenz in der Arbeitswelt* (pp. 101–137). transcript Verlag.
- Gesellschaft für Informatik e.V. (2018). *Technische und rechtliche Betrachtungen algorithmischer Entscheidungsverfahren: Gutachten der Fachgruppe Rechtsinformatik der Gesellschaft für Informatik e.V. im Auftrag des Sachverständigenrats für Verbraucherfragen*. Sachverständigenrat für Verbraucherfragen (SVRV). https://gi.de/fileadmin/GI/Allgemein/PDF/GI_Studie_Algorithmenregulierung.pdf
- Gibbs, M., Mengel, F., & Siemroth, C. (2021). *Work from Home & Productivity: Evidence from Personnel & Analytics Data on IT Professionals* (Working Paper NO. 2021–56). Becker Friedman Institute for Economics at University of Chicago. https://bfi.uchicago.edu/wp-content/uploads/2021/05/BFI_WP_2021-56.pdf
- Giering, O. (2022). Künstliche Intelligenz und Arbeit: Betrachtungen zwischen Prognose und betrieblicher Realität. *Zeitschrift Für Arbeitswissenschaft*, 76, 50–64. <https://doi.org/10.1007/s41449-021-00289-0>
- Giering, O., Fedorets, A., Adriaans, J., & Kirchner, S. (2021). Künstliche Intelligenz in Deutschland: Erwerbstätige wissen oft nicht, dass sie mit KI-basierten Systemen arbeiten. *DIW Wochenbericht*, 88(48), 783–789. https://doi.org/10.18723/diw_wb:2021-48-1
- Giering, O., & Kirchner, S. (2021). Künstliche Intelligenz am Arbeitsplatz: Forschungsstand, Konzepte und empirische Zusammenhänge zu Autonomie. *Soziale Welt*, 72(4), 551–588. <https://doi.org/10.5771/0038-6073-2021-4-551>
- Gilbert, A., Thomas, A., Pissarides, C., Al-Izzi, H., Miller, C., & Burnell, E. (2021). *The Amazonian Era: How algorithmic systems are eroding good work*. Institute for the Future of Work (IFOW). https://uploads-ssl.webflow.com/5f57d40eb1c2ef22d8a8ca7e/60afae719661d0c857ed2068_IFOW%20The%20Amazonian%20Era.pdf
- Glock, G., Krael, S., Strach, H., Apt, W., Priesack, K., & Bovenschulte, M. (2019). *Qualität der Arbeit, Beschäftigung und Beschäftigungsfähigkeit im Wechselspiel von Technologie, Organisation und Qualifikation (QuaTOQ): Branchenbericht: Finanzen und Versicherungen* (Forschungsbericht 522/5). Bundesministerium für Arbeit und Soziales (BMAS). <https://www.bmas.de/DE/Service/Publikationen/Forschungsberichte/fb522-5-quatoq.html>
- Glock, G., Priesack, K., Apt, W., Strach, H., Krael, S., & Bovenschulte, M. (2018). *Qualität der Arbeit, Beschäftigung und Beschäftigungsfähigkeit im Wechselspiel von Technologie, Organisation und Qualifikation (QuaTOQ): Branchenbericht: Pflege und Versorgung* (Forschungsbericht 522/2).

- Bundesministerium für Arbeit und Soziales (BMAS). <https://www.bmas.de/DE/Service/Publikationen/Forschungsberichte/fb522-2-qualitaet-der-arbeit-branchenbericht-pflege.html>
- Goos, M., & Manning, A. (2007). Lousy and Lovely Jobs: The Rising Polarization of Work in Britain. *The Review of Economics and Statistics*, 89(1), 118–133. <https://www.jstor.org/stable/40043079>
- Gröner, S., & Heinecke, S. (2019). *Kollege KI: Künstliche Intelligenz verstehen und sinnvoll im Unternehmen einsetzen*. Redline Verlag.
- Grunau, P., Ruf, K., Steffes, S., & Wolter, S. (2019). *Homeoffice bietet Vorteile, hat aber auch Tücken: Mobile Arbeitsformen aus Sicht von Betrieben und Beschäftigten* (IAB-Kurzbericht 11 | 2019). Institut für Arbeitsmarkt- und Berufsforschung (IAB). <https://doku.iab.de/kurzber/2019/kb1119.pdf>
- Haberstroh, M., & Wolf, J. (2005). *Individuelle Autonomie in Projektteams* (Manuskripte aus den Instituten für Betriebswirtschaftslehre der Universität Kiel No.585). Christian-Albrechts-Universität zu Kiel. Institut für Betriebswirtschaftslehre. https://www.econstor.eu/bitstream/10419/147645/1/manuskript_585.pdf
- Hacker, W. (1978). *Allgemeine Arbeits- und Ingenieurpsychologie: Psychische Struktur und Regulation von Arbeitstätigkeiten* (2nd ed.). *Schriften zur Arbeitspsychologie: Vol.20*. Huber Verlag.
- Hackman, J. R., & Lawler, E. E. (1971). Employee reactions to job characteristics. *Journal of Applied Psychology*, 55(3), 259–286. <https://doi.org/10.1037/h0031152>
- Hackman, J. R., & Oldham, G. R. (1974). *The Job Diagnostic Survey: An Instrument for the Diagnosis of Jobs and the Evaluation of Job Redesign Projects. Technical report: No. 4*. <https://apps.dtic.mil/sti/pdfs/AD0779828.pdf>
- Hackman, J. R., & Oldham, G. R. (1975). Development of the Job Diagnostic Survey. *Journal of Applied Psychology*, 60(2), 159–170. <https://doi.org/10.1037/h0076546>
- Hahnel, E., Pörschmann-Schreiber, U., Braeseke, G., Lingott, N., & Oehse, I. (2021). *Verbesserte Koordinierung in der ambulanten Pflege: Zwischenbericht für das Bundesministerium für Gesundheit*. IGES Institut. https://www.bundesgesundheitsministerium.de/fileadmin/Dateien/3_Downloads/R/Ressortforschung/IGES_Institut_Zwischenbericht_Effizienzpotentiale_U5283-barrierefrei-korr.pdf
- Haipeter, T. (2006). Bankkaufleute in der Reorganisation. *Zeitschrift Für Soziologie*, 35(1), 57–76. <https://doi.org/10.1515/zfsoz-2006-0104>
- Haipeter, T. (2020). Entwicklung, Herausforderungen und Perspektiven der Leistungsregulierung. *WSI Mitteilungen*, 73(1), 47–54. <https://doi.org/10.5771/0342-300X-2020-1-47>
- Hall, A. (2007). *Tätigkeiten und berufliche Anforderungen in wissensintensiven Berufen: Empirische Befunde auf Basis der BIBB/BAuA-Erwerbstätigenbefragung 2006* (Studien zum deutschen Innovationssystem Nr.3–2007). Bundesin-

- stitut für Berufsbildung (BIBB). https://ams-forschungsnetzwerk.at/download-pub/anforderungen_in_wissensintensiven_berufen_bibb.pdf
- Hall, A., & Siefer, A. (2011). *BIBB/BAuA-Erwerbstätigenbefragung 2011/2012: Arbeit und Beruf im Wandel, Erwerb und Verwertung beruflicher Qualifikationen*. Erhebungsinstrument. Fragebogenmaster für die CATI-Programmierung inkl. Variablenkennung. Version Hauptbefragung 17.10.2011–01.04.2012. Bundesinstitut für Berufsbildung (BIBB); Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). https://www.baua.de/DE/Aufgaben/Forschung/Forschungsprojekte/pdf/F2275-Fragebogen.pdf?__blob=publicationFile
- Hall, A., & Siefer, A. (2017). *BIBB/BAuA-Erwerbstätigenbefragung 2018: Arbeit und Beruf im Wandel, Erwerb und Verwertung beruflicher Qualifikationen*. Erhebungsinstrument. Fragebogenmaster für die CATI-Programmierung inkl. Variablenkennung. Version Haupterhebung 02.10.2017–05.04.2018. Berufsbildung (BIBB); Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). https://www.bibb.de/dokumente/pdf/a12_Fragebogen_ETB2018_Endfassung.pdf
- Haller, S., & Wissing, C. (2020). *Dienstleistungsmanagement: Grundlagen – Konzepte – Instrumente* (8th ed.). Springer Gabler.
- Haug, S. (2021). Nutzung, Planung und Bewertung digitaler Assistenzsysteme in der Pflege: Ergebnisse einer Befragung von Führungskräften in ambulanten und stationären Einrichtungen. In D. Frommelt, U. Scorna, S. Haug, & K. Weber (Eds.), *Gute Technik für ein gutes Leben im Alter? Akzeptanz, Chancen und Herausforderungen altersgerechter Assistenzsysteme* (pp. 185–214). transcript Verlag.
- Heintz, B. (1995). “Papiermaschinen”: Die sozialen Voraussetzungen maschineller Intelligenz. In W. Rammert (Ed.), *Soziologie und künstliche Intelligenz: Produkte und Probleme einer Hochtechnologie* (pp. 37–64). Campus-Verlag.
- Hielscher, V. (2014). *Technikeinsatz und Arbeit in der Altenpflege: Ergebnisse einer internationalen Literaturrecherche* (Reihe: iso-Report. Berichte aus Forschung und Praxis Nr.1). Institut für Sozialforschung und Sozialwirtschaft e.V. (iso). https://www.iso-institut.de/wp-content/uploads/2018/11/iso-Report_Nr.1_Hielscher_Technikeinsatz_2014.pdf
- Hielscher, V. (2020). Digitalisierungsprozesse und Interaktionsarbeit in der Pflege. In P. Bleses, B. Busse, & A. Friemer (Eds.), *Digitalisierung der Arbeit in der Langzeitpflege als Veränderungsprojekt* (pp. 33–45). Springer Vieweg.
- Hielscher, V., Kirchen-Peters, S., & Sowinski, C. (2015). Technologisierung der Pflegearbeit? Wissenschaftlicher Diskurs und Praxisentwicklungen in der stationären und ambulanten Langzeitpflege. *Pflege & Gesellschaft*, 20(1), 5–66.
- Hirsch-Kreinsen, H. (2018). *Arbeit 4.0: Pfadabhängigkeit statt Disruption* (Soziologisches Arbeitspapier Nr. 52/2018). Technische Universität Dortmund. <https://d-nb.info/1160443211/34>

- Hirsch-Kreinsen, H. (2020). *Digitale Transformation der Arbeit: Entwicklungstrends und Gestaltungsansätze. Moderne Produktion*. Kohlhammer Verlag.
- Hirsch-Kreinsen, H. (2023). Digitalisierung von Arbeit – ein Alltagsthema ? *WSI Mitteilungen*, 76(5), 330. <https://doi.org/10.5771/0342-300X-2023-5-330>
- Hochschild, A. R. (1983). *The Managed Heart: Commercialization of Human Feeling*. University of California Press.
- Holler, M., & Dörflinger, N. (2021). *Faktenblatt 01. Interaktionsarbeit: Die Arbeit an und mit Menschen als besondere Form der Erwerbsarbeit*. Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). https://www.interaktionsarbeit.de/SharedDocs/Publikationen/DE/faktenblatt-01.pdf?__blob=publicationFile&v=3
- Holler, M., & Dörflinger, N. (2022). *Faktenblatt 02. Arbeitszeitlege und Entgrenzung in der Interaktionsarbeit*. Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). https://www.interaktionsarbeit.de/SharedDocs/Publikationen/DE/faktenblatt-02.pdf?__blob=publicationFile&v=4
- Horgan, A. (2021). *Lost in Work: Escaping Capitalism. Outspoken by Pluto*. Pluto Press.
- Huchler, N. (2019). Assimilierende versus komplementäre Adaptivität: Grenzen (teil-)autonomer Systeme. In H. Hirsch-Kreinsen & A. Karačić (Eds.), *Autonome Systeme und Arbeit: Perspektiven, Herausforderungen und Grenzen der Künstlichen Intelligenz in der Arbeitswelt* (pp. 139–179). transcript Verlag.
- Huchler, N. (2022). Komplementäre Arbeitsgestaltung. Grundrisse eines Konzepts zur Humanisierung der Arbeit mit KI. *Zeitschrift Für Arbeitswissenschaft*, 76, 158–175. <https://doi.org/10.1007/s41449-022-00319-5>
- Huchler, N. (2023). Arbeiten mit Künstlicher Intelligenz. Wie KI Arbeit strukturiert und was sie mit der indirekten Steuerung verbindet. *WSI Mitteilungen*, 76(5), 365–373. <https://doi.org/10.5771/0342-300X-2023-5-365>
- Hülken-Giesler, M., Daxberger, S., Peters, M., & Wirth, L.-M. (2019). Technikbereitschaft in der ambulanten Pflege. *Pflege*, 32(6), 334–342. <https://doi.org/10.1024/1012-5302/a000702>
- Hünefeld, L., Wöhrmann, A. M., & Brauner, C. (2019). Arbeiten unter Druck: Arbeitsintensität, Arbeitszeitautonomie und Wohlbefinden von Beschäftigten in Deutschland. In M. Griesbacher, J. Hödl, J. Muckenhuber, & K. Scaria-Braunstein (Eds.), *Intensivierung der Arbeit: Perspektiven auf Arbeitszeit und technologischen Wandel* (pp. 73–86). new academic press.
- Institut DGB-Index Gute Arbeit (DGB-Index). (2018a). *Arbeitsbedingungen in der Alten- und Krankenpflege. So beurteilen die Beschäftigten die Lage: Ergebnisse einer Sonderauswertung der Repräsentativumfragen zum DGB-Index Gute Arbeit*. <https://index-gute-arbeit.dgb.de/++co++df07ee92-b1ba-11e8-b392-52540088cada>
- Institut DGB-Index Gute Arbeit (DGB-Index). (2018b). *DGB-Index Gute Arbeit. Der Report 2018: Wie die Beschäftigten die Arbeitsbedingungen in Deutsch-*

- land beurteilen*. Mit dem Themenschwerpunkt: Arbeit mit Kundschaft, PatientInnen, Lernenden etc. <https://index-gute-arbeit.dgb.de/++co++2710716a-e72f-11e8-891f-52540088cada>
- Institut DGB-Index Gute Arbeit (DGB-Index). (2019). *Jahresbericht 2019: Ergebnisse der Beschäftigtenbefragung zum DGB-Index Gute Arbeit 2019*. Schwerpunktthema Arbeitsintensität. <https://index-gute-arbeit.dgb.de/++co++9f780858-1513-11ea-a393-52540088cada>
- Institut DGB-Index Gute Arbeit (DGB-Index). (2020). *Jahresbericht 2020: Ergebnisse der Beschäftigtenbefragung zum DGB-Index Gute Arbeit 2020: Schwerpunktthema Mobile Arbeit*. <https://index-gute-arbeit.dgb.de/++co++7239c414-349b-11eb-93d8-001a4a160123>
- Institut DGB-Index Gute Arbeit (DGB-Index). (2021a). *Arbeiten im Home-office: Zwischen Gestaltungsspielraum und Mehrbelastung* (Kompakt 01/2021). <https://index-gute-arbeit.dgb.de/++co++ef27e8c2-d81d-11eb-8627-001a4a160123>
- Institut DGB-Index Gute Arbeit (DGB-Index). (2021b). *Jahresbericht 2021: Ergebnisse der Beschäftigtenbefragung zum DGB-Index Gute Arbeit 2021: Schwerpunktthema: Unter erschwerten Bedingungen – Corona und die Arbeitswelt*. <https://index-gute-arbeit.dgb.de/++co++2f72d218-544a-11ec-8533-001a4a160123>
- Institut DGB-Index Gute Arbeit (DGB-Index). (2022a). *Jahresbericht 2022: Ergebnisse der Beschäftigtenbefragung zum DGB-Index Gute Arbeit 2022*. <https://index-gute-arbeit.dgb.de/++co++60787eb2-6b37-11ed-8d14-001a4a160123>
- Institut DGB-Index Gute Arbeit (DGB-Index). (2022b). *Report 2022: Digitale Transformation – Veränderungen der Arbeit aus Sicht der Beschäftigten*. Ergebnisse des DGB-Index Gute Arbeit 2022. <https://index-gute-arbeit.dgb.de/veroeffentlichungen/jahresreports/++co++7ed5ba7e-6b36-11ed-981a-001a4a160123>
- Institut DGB-Index Gute Arbeit (DGB-Index). (2023). *Arbeitsbedingungen in der Pflege revisited: Was hat sich in den vergangenen Jahren getan?* (Kompakt 02/2023). <https://index-gute-arbeit.dgb.de/++co++e6d7006e-ef35-11ed-baf5-001a4a160123>
- Jahoda, M. (1983). *Wieviel Arbeit braucht der Mensch? Arbeit und Arbeitslosigkeit im 20. Jahrhundert* (G. Holl, Trans.) (2nd ed.). Psychologie heute. Beltz Verlag.
- Jahoda, M. (1986). Artificial intelligence: an outsider's perspective. *Science and Public Policy*, 13(6), 333–340. <https://doi.org/10.1093/spp/13.6.333>
- Janson, P., & Rathmann, K. (2021). Berufliche Belastungen, psychische Beanspruchung und Gesundheitskompetenz bei Pflegekräften in der ambulanten Altenpflege: Eine quantitative Online-Befragung in ausgewählten bayerischen Großstädten. *Prävention Und Gesundheitsförderung*, 16(4), 344–353. <https://doi.org/10.1007/s11553-020-00826-5>

- Jonge, J. de, & Schaufeli, W. B. (1998). Job characteristics and employee well-being: a test of Warr's Vitamin Model in health care workers using structural equation modelling. *Journal of Organizational Behavior*, 19(4), 387–407. <https://api.semanticscholar.org/CorpusID:18388414>
- Jönsson, T., & Jeppesen, H. J. (2013). Under the influence of the team? An investigation of the relationships between team autonomy, individual autonomy and social influence within teams. *The International Journal of Human Resource Management*, 24(1), 78–93. <https://doi.org/10.1080/09585192.2012.672448>
- Jungtäubl, M. (2021). Gestaltung von Interaktionsarbeit und professionellem Handeln bei personenbezogener Dienstleistungsarbeit zwischen (digitalisierter) Formalisierung und Selbstorganisation. In C. Freier, J. König, A. Manzeschke, & B. Städler-Mach (Eds.), *Gegenwart und Zukunft Sozialer Dienstleistungsarbeit: Chancen und Risiken der Digitalisierung in der Sozialwirtschaft* (pp. 30–48). Springer VS.
- Jurczyk, K. (2002). Entgrenzungen von Zeit und Gender – Neue Anforderungen an die Funktionslogik von Lebensführung? In M. Wehrich & G. G. Voß (Eds.), *Arbeit und Leben im Umbruch: Vol. 2. tag für tag: Alltag als Problem – Lebensführung als Lösung?* (pp. 95–115). Rainer Hampp Verlag.
- Karasek, R. A. (1979). Job Demands, Job Decision Latitude, and Mental Strain: Implications for Job Redesign. *Administrative Science Quarterly*, 24(2), 285–308. <https://doi.org/10.2307/2392498>
- Karl, A. (2022). *Potenziale und Anwendungsszenarien künstlicher Intelligenz in häuslichen Pflegearrangements im Kontext einer alternden Gesellschaft* (BZPD Working Paper 02|2022). Bayerisches Forschungszentrum Pflege Digital (BZPD). <https://opus4.kobv.de/opus4-hs-kempten/frontdoor/deliver/index/docId/1240/file/BZPDWP022022AlexanderKarlpdfA.pdf>
- King, B. (2019). *Bank 4.0: Banking Everywhere, Never at a Bank*. Wiley.
- Kirchner, S., Meyer, S.-C., & Tisch, A. (2020). *Digitaler Taylorismus für einige, digitale Selbstbestimmung für die anderen? Ungleichheit der Autonomie in unterschiedlichen Tätigkeitsdomänen* (baua: Fokus). Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). <https://www.baua.de/DE/Angebote/Publikationen/Fokus/Digitalisierung-2.html>
- Kleemann, F. (2012). Subjektivierung von Arbeit – Eine Reflexion zum Stand des Diskurses. *Arbeits- Und Industrie soziologische Studien*, 5(2), 6–20. <https://doi.org/10.21241/ssoar.64781>
- Knights, D., & Willmott, H. (1990). *Labour Process Theory* (1st ed.). *Studies in the Labour Process Series*. Palgrave Macmillan.
- Koeszegi, S. T. (2021). Spannungsfeld automatisierte Entscheidungssysteme und Autonomie. In R. Altenburger & R. Schmidpeter (Eds.), *Management-Reihe Corporate Social Responsibility. CSR und Künstliche Intelligenz* (61–76). Springer Gabler.
- Kohlrausch, B. (2019). Soziale Ungleichheit und Verunsicherung im Zeitalter der Digitalisierung. In B. Kohlrausch, C. Schildmann, & D. Voss-Dahm (Eds.),

- Arbeitsgesellschaft im Wandel. Neue Arbeit – neue Ungleichheiten? Folgen der Digitalisierung* (pp. 16–34). Beltz Juventa.
- Korczynski, M. (2013). The customer in the sociology of work: different ways of going beyond the management–worker dyad. *Work, Employment and Society*, 27(6), 1–7. <https://doi.org/10.1177/0950017012464424>
- Korinek, A., & Stiglitz, J. (2017). *Artificial Intelligence and Its Implications for Income Distribution and Unemployment* (NBER Working Paper No. 24174). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w24174>
- Krafft, T. D., & Zweig, K. A. (2018). Wie Gesellschaft algorithmischen Entscheidungen auf den Zahn fühlen kann. In R. Mohabbat Kar, B. E. P. Thapa, & P. Parycek (Eds.), *(Un)berechenbar? Algorithmen und Automatisierung in Staat und Gesellschaft* (pp. 471–492). Fraunhofer-Institut für Offene Kommunikationssysteme FOKUS; Kompetenzzentrum Öffentliche IT (ÖFIT).
- Kratzer, N., & Dunkel, W. (2013). Neue Steuerungsformen bei Dienstleistungsarbeit – Folgen für Arbeit und Gesundheit. In G. Junghanns & M. Morschhäuser (Eds.), *Immer schneller, immer mehr: Psychische Belastung bei Wissens- und Dienstleistungsarbeit* (pp. 41–61). Springer VS.
- Kraus, T., Ganschow, L., Eisenträger, M., & Wischmann, S. (2021). *Erklärbare KI: Anforderungen, Anwendungsfälle und Lösungen*. Technologieprogramm KI-Innovationswettbewerb des Bundesministeriums für Wirtschaft und Energie. https://www.digitale-technologien.de/DT/Redaktion/DE/Downloads/Publikation/KI-Inno/2021/Studie_Erklaeerbare_KI.pdf;jsessionid=C94CE1AF540F11B6D64E3EB19A61A2AF?__blob=publicationFile&v=9
- Krick, T., Huter, K., Domhoff, D., Schmidt, A., Rothgang, H., & Wolf-Ostermann, K. (2019). Digital technology and nursing care: A scoping review on acceptance, effectiveness and efficiency studies of informal and formal care technologies. *BMC Health Services Research*, 19(1), 400. <https://doi.org/10.1186/s12913-019-4238-3>
- Krug, G., Kemna, K., & Hartosch, K. (2019). *Auswirkungen flexibler Arbeitszeiten auf die Gesundheit von Beschäftigten* (IAB-Discussion Paper 01/2019). Institut für Arbeitsmarkt- und Berufsforschung (IAB). <https://doku.iab.de/discussionpapers/2019/dp0119.pdf>
- Kubicek, B., Paškván, M., & Bunner, J. (2017). The Bright and Dark Sides of Job Autonomy. In C. Korunka & B. Kubicek (Eds.), *Job Demands in a Changing World of Work: Impact on Workers' Health and Performance and Implications for Research and Practice* (pp. 45–63). Springer.
- Kumbruck, C., & Senghaas-Knobloch, E. (2019). Die Grenzen instrumenteller Verfügbarkeit von Subjektivität – Einsichten aus der Arbeitswelt der Pflege. In F. Böhle & E. Senghaas-Knobloch (Eds.), *Andere Sichtweisen auf Subjektivität: Impulse für kritische Arbeitsforschung* (pp. 131–165). Springer VS.
- Laaser, K. (2016). 'If you are having a go at me, I am going to have a go at you': the changing nature of social relationships of bank work under performance

- management. *Work, Employment and Society*, 30(6), 1000–1016. <https://doi.org/10.1177/0950017015617686>
- Lallement, M. (2015). Work and the challenge of autonomy. *Social Science Information*, 54(2), 229–248. <https://doi.org/10.1177/0539018414566423>
- Lane, C., & Quack, S. (2002). *How banks construct and manage risk: a sociological study of small firm lending in Britain and Germany* (WZB Discussion Paper No. FS I 02-101). Wissenschaftszentrum Berlin für Sozialforschung (WZB). <https://www.ssoar.info/ssoar/handle/document/11245>
- Lane, M., & Saint-Martin, A. (2021). *The impact of Artificial Intelligence on the labour market: What do we know so far?* (OECD Social, Employment and Migration Working Papers No.256). OECD Publishing. https://www.oecd-ilibrary.org/social-issues-migration-health/the-impact-of-artificial-intelligence-on-the-labour-market_7c895724-en
- Langer, M., König, C. J., & Busch, V. (2021). Changing the means of managerial work: effects of automated decision support systems on personnel selection tasks. *Journal of Business and Psychology*, 36(5), 751–769. <https://doi.org/10.1007/s10869-020-09711-6>
- Langfred, C. W. (2000). The paradox of self-management: individual and group autonomy in work groups. *Journal of Organizational Behavior*, 21(5), 563–585. <https://www.jstor.org/stable/3100449>
- Langfred, C. W. (2005). Autonomy and Performance in Teams: The Multilevel Moderating Effect of Task Interdependence. *Journal of Management*, 31(4), 513–529. <https://doi.org/10.1177/0149206304272190>
- Langfred, C. W., & Moye, N. A. (2004). Effects of Task Autonomy on Performance: An Extended Model Considering Motivational, Informational, and Structural Mechanisms. *The Journal of Applied Psychology*, 89(6), 934–945. <https://doi.org/10.1037/0021-9010.89.6.934>
- Leonhardt, F., & Wiedemann, A. (2017a). *Digitalisierung und Personalisierung im Spannungsfeld von Kunden-und Bankinteressen* (Aufsätze 4/2017). Zeitschrift für das gesamte Kreditwesen. <https://www.kreditwesen.de/kreditwesen/themenschwerpunkte/aufsaeetze/digitalisierung-personalisierung-spannungsfeld-kunden-bankin-id37973.html>
- Leonhardt, F., & Wiedemann, A. (2017b). Kundenansprache mit Empfehlungssystem. *Bank und Markt*(9), 25–28. https://www.kreditwesen.de/sites/default/files/content/articledownloads/2017/36/bum_17_09_25-28.pdf
- Lepperhoff, J. (2011). Qualität von Arbeit: messen – analysieren – umsetzen. In Bundeszentrale für politische Bildung (Ed.), *Aus Politik und Zeitgeschichte (APuZ): 15/2011. Humanisierung der Arbeit* (pp. 32–37).
- Lezock, M., & Klewer, J. (2014). Analyse der Touren- und Einsatzplanung eines ambulanten Pflegedienstes. *HeilberufeScience*, 5(1), 31–35. <https://doi.org/10.1007/s16024-013-0169-9>
- Liao, S. M. (Ed.). (2020). *Ethics of Artificial Intelligence*. Oxford University Press.

- Logg, J. M., Minson, J. A., & Moore, D. A. (2019). Algorithm appreciation: People prefer algorithmic to human judgment. *Organizational Behavior and Human Decision Processes*, 151, 90–103. <https://doi.org/10.1016/j.obhdp.2018.12.005>
- Lopes, H., Lagoa, S., & Calapez, T. (2014). Work autonomy, work pressure, and job satisfaction: An analysis of European Union countries. *The Economic and Labour Relations Review*, 25(2), 306–326. <https://doi.org/10.1177/1035304614533868>
- Lott, Y. (2017). *Stressed despite or because of flexible work arrangements? Flexible work arrangements, job pressure and work-to-home conflict for women and men in Germany* (Working Paper Forschungsförderung Number 046). Hans-Böckler-Stiftung (HBS). https://www.boeckler.de/fpdf/HBS-006637/p_fofoe_WP_046_2017.pdf
- Lott, Y. (2020). (Fehlende) Selbstbestimmung über die Arbeitszeit und Abschalten von der Arbeit: Welche Rolle spielen Intensität und Extensivierung der Arbeit? *WSI Mitteilungen*, 73(1), 38–46. <https://doi.org/10.5771/0342-300X-2020-1-38>
- Lott, Y., & Ahlers, E. (2021). *Flexibilisierung der Arbeitszeit: Warum das bestehende Arbeitszeitgesetz und eine gesetzliche Arbeitszeiterfassung wichtig sind* (Report Nr. 68). Wirtschafts- und Sozialwissenschaftliches Institut (WSI). https://www.boeckler.de/fpdf/HBS-008176/p_wsi_report_68_2021.pdf
- Luong, A., Kumar, N., & Lang, K. R. (2020). *Algorithmic Decision-Making: Examining the Interplay of People, Technology, and Organizational Practices through an Economic Experiment* (Baruch College Zicklin School of Business Research Paper No.2020-02-03). Baruch College at City University of New York. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3529679
- Lutze, M., Glock, G., Stubbe, J., & Paulicke, D. (2019). *Digitalisierung und Pflegebedürftigkeit – Nutzen und Potenziale von Assistenztechnologien* (Schriftenreihe Modellprogramm zur Weiterentwicklung der Pflegeversicherung Band 15). GKV-Spitzenverband. https://www.gkv-spitzenverband.de/media/dokumente/service_1/publikationen/schriftenreihe/GKV-Schriftenreihe_Pflege_Band_15.pdf
- Lutze, M., Trauzettel, F., Busch-Heizmann, A., & Bovenschulte, M. (2021). *Potenziale einer Pflege 4.0: Wie innovative Technologien Entlastung schaffen und die Arbeitszufriedenheit von Pflegefachpersonen in der Langzeitpflege verändern*. Bertelsmann Stiftung. https://www.bertelsmann-stiftung.de/fileadmin/files/user_upload/Pflege_4.0_final.pdf
- Marrs, K. (2018). Herrschaft und Kontrolle in der Arbeit. In F. Böhle, G. G. Voß, & G. Wachtler (Eds.), *Handbuch Arbeitssoziologie: Band 1: Arbeit, Strukturen und Prozesse* (2nd ed., pp. 473–502). Springer VS.
- Mayring, P. (2010). *Qualitative Inhaltsanalyse: Grundlagen und Techniken* (11th ed.). Pädagogik. Beltz.

- Mayring, P. (2016). *Einführung in die qualitative Sozialforschung* (6th ed.). Pädagogik. Beltz.
- Mazmanian, M., Orlikowski, W. J., & Yates, J. (2013). The Autonomy Paradox: The Implications of Mobile Email Devices for Knowledge Professionals. *Organization Science*, 24(5), 1337–1357. <https://doi.org/10.1287/orsc.1120.0806>
- Meinungsmonitor Künstliche Intelligenz (MeMo:KI). (2020). *Künstliche Intelligenz in der Arbeitswelt: Wie nimmt die Bevölkerung den Einfluss von Künstlicher Intelligenz auf die Zukunft der Arbeitswelt wahr?* (Factsheet Nr. 3). <https://www.cais-research.de/wp-content/uploads/Factsheet-3-Arbeitswelt.pdf>
- Menz, W., & Nies, S. (2018). Methoden der Arbeitssoziologie. In F. Böhle, G. G. Voß, & G. Wachtler (Eds.), *Handbuch Arbeitssoziologie: Band 1: Arbeit, Strukturen und Prozesse* (2nd ed., pp. 265–318). Springer VS.
- Menz, W., Nies, S., & Sauer, D. (2019). Digitale Kontrolle und Vermarktlichung. Beschäftigtenautonomie im Kontext betrieblicher Strategien der Digitalisierung. *PROKLA*, 49(195), 181–200. <https://doi.org/10.32387/prokla.v49i195.1808>
- Menzel, C., & Winkler, C. (2018). *Zur Diskussion der Effekte Künstlicher Intelligenz in der wirtschaftswissenschaftlichen Literatur* (Diskussionspapier Nr. 8). Bundesministerium für Wirtschaft und Energie (BMWi). https://www.bmwk.de/Redaktion/DE/Downloads/Diskussionspapiere/20190205-diskussionspapier-effekte-kuenstlicher-intelligenz-in-der-wirtschaftswissenschaftlichen-literatur.pdf?__blob=publicationFile&v=6
- Merda, M., Schmidt, K., & Kähler, B. (2017). *Pflege 4.0 – Einsatz moderner Technologien aus der Sicht professionell Pflegender: Forschungsbericht*. Berufsgenossenschaft für Gesundheitsdienst (BGW). <https://www.bgw-online.de/resource/blob/20346/e735030f6178101cf2ea9fa14e1bc063/bgw09-14-002-pflege-4-0-einsatz-moderner-technologien-data.pdf>
- Mergener, A., & Trübner, M. (2022). Social relations and employees' rejection of working from home: A social exchange perspective. *New Technology, Work and Employment*, 37(3), 469–487. <https://doi.org/10.1111/ntwe.12247>
- Meutgens, J. (2014). Industrialisierung von Bankprozessen. In S. Walter & G. Kaiser (Eds.), *Dokumentenlogistik: Theorie und Praxis* (pp. 239–251). Springer Vieweg.
- Meyer, M., Wing, L., Schenkel, A., & Meschede, M. (2021). Krankheitsbedingte Fehlzeiten in der deutschen Wirtschaft im Jahr 2020. In B. Badura, A. Ducki, H. Schröder, & M. Meyer (Eds.), *Fehlzeiten-Report 2021: Betriebliche Prävention stärken – Lehren aus der Pandemie* (441–538). Springer.
- Meyer, S.-C., Hartwig, M., Tisch, A., & Wischniewski, S. (2022). Künstliche Intelligenz am Arbeitsplatz: Verbreitung und Hinweise auf Zusammenhänge mit Arbeitsqualität. In A. Tisch & S. Wischniewski (Eds.), *Sicherheit und Gesundheit in der digitalisierten Arbeitswelt: Kriterien für eine menschengerechte Gestaltung* (1st ed., pp. 313–338). edition sigma in der Nomos Verlagsgesellschaft.

- Meyer, S.-C., Tisch, A., & Hünefeld, L. (2019). Arbeitsintensivierung und Handlungsspielraum in digitalisierten Arbeitswelten – Herausforderung für das Wohlbefinden von Beschäftigten? *Industrielle Beziehungen*, 26(2–2019), 207–231. <https://doi.org/10.3224/indbez.v26i2.06%0A>
- Mlynář, J., Alavi, H. S., Verma, H., & Cantoni, L. (2018). Towards a Sociological Conception of Artificial Intelligence. In M. Iklé, A. Franz, R. Rzepka, & B. Goertzel (Eds.), *Lecture notes in computer science Lecture notes in artificial intelligence: Vol. 10999. Artificial general intelligence: 11th International Conference, AGI 2018, Prague, Czech Republic, August 22–25, 2018 : Proceedings* (Vol. 10999, pp. 130–139). Springer.
- Moldaschl, M. (2001). Herrschaft durch Autonomie – Dezentralisierung und widersprüchliche Arbeitsanforderungen. In B. Lutz (Ed.), *Entwicklungsperspektiven von Arbeit: Ergebnisse aus dem Sonderforschungsbereich 333 der Universität München* (pp. 132–164). De Gruyter.
- Morgeson, F. P., Delaney-Klinger, K., & Hemingway, M. A. (2005). The Importance of Job Autonomy, Cognitive Ability, and Job-Related Skill for Predicting Role Breadth and Job Performance. *Journal of Applied Psychology*, 90(2), 399–406. <https://doi.org/10.1037/0021-9010.90.2.399>
- Morgeson, F. P., & Humphrey, S. E. (2006). The Work Design Questionnaire (WDQ): Developing and Validating a Comprehensive Measure for Assessing Job Design and the Nature of Work. *The Journal of Applied Psychology*, 91(6), 1321–1339. <https://doi.org/10.1037/0021-9010.91.6.1321>
- Mronga, M. I. (2013). Männlichkeit und Arbeitskraftunternehmer. In M. I. Mronga (Ed.), *Die Konstruktion von Männlichkeit im Management: Eine Analyse entgrenzter Arbeitsstrukturen* (pp. 95–115). Springer VS.
- Müller-Mall, S. (2020). *Freiheit und Kalkül: Die Politik der Algorithmen. Reclams Universal-Bibliothek: Vol. 14043*. Reclam Verlag.
- Munn, L. (2023). The uselessness of AI ethics. *AI and Ethics*, 3, 869–877. <https://doi.org/10.1007/s43681-022-00209-w>
- Nachtwey, O., & Staab, P. (2015). Die Avantgarde des digitalen Kapitalismus. *Mittelweg* 36, 24(6), 59–84. https://www.researchgate.net/publication/292994969_Die_Avantgarde_des_digitalen_Kapitalismus
- Nedelkoska, L., & Quintini, G. (2018). *Automation, skills use and training* (OECD Social, Employment and Migration Working Papers No. 202). OECD Publishing. https://www.oecd-ilibrary.org/employment/automation-skills-use-and-training_2e2f4eea-en
- Neu, M., Müller, M., Pothén, B., & Zingel, M. (2022). *Anwendungsfelder und Herausforderungen der Künstlichen Intelligenz: Wie KI die Gesellschaft und Marketing beeinflusst*. Springer Gabler.
- Nguyen, A., Taylor, J., & Bradley, S. (2003). *Job autonomy and job satisfaction: new evidence* (Working Papers 2003/050). Lancaster University Management School, Economics Department. <https://www.lancaster.ac.uk/media/lancaster->

- university/content-assets/documents/lums/economics/working-papers/JobAutonomy.pdf
- Nicholson, N. (1984). A Theory of Work Role Transitions. *Administrative Science Quarterly*, 29(2), 172–191. <https://doi.org/10.2307/2393172>
- Nies, S. (2015). *Nützlichkeit und Nutzung von Arbeit: Beschäftigte im Konflikt zwischen Unternehmenszielen und eigenen Ansprüchen*. edition sigma in der Nomos Verlagsgesellschaft.
- Nies, S. (2021). Eine Frage der Kontrolle? Betriebliche Strategien der Digitalisierung und die Autonomie von Beschäftigten in der Produktion. *Berliner Journal Für Soziologie*, 31(3–4), 475–504. <https://doi.org/10.1007/s11609-021-00452-8>
- Nilsson, N. J. (2010). *The Quest for Artificial Intelligence: A History of Ideas and Achievements*. Cambridge University Press.
- Nyckel, E.-M., Schaupp, S., & Staab, P. (2017). Kybernetik und Kontrolle. Algorithmische Arbeitssteuerung und betriebliche Herrschaft. *PROKLA*, 47(187), 229–248. <https://doi.org/10.32387/prokla.v47i187.143>
- Papsdorf, C. (2019). *Digitale Arbeit: Eine soziologische Einführung*. Campus-Verlag.
- Parasuraman, R., Sheridan, T. B., & Wickens, C. D. (2000). A Model for Types and Levels of Human Interaction with Automation. *IEEE Transactions on Systems, Man, and Cybernetics – Part a: Systems and Humans*, 30(3), 286–297. <https://doi.org/10.1109/3468.844354>
- Parent-Rochelleau, X., & Parker, S. K. (2022). Algorithms as work designers: How algorithmic management influences the design of jobs. *Human Resource Management Review*, 32(3), 100838. <https://doi.org/10.1016/j.hrmr.2021.100838>
- Park, R., & Searcy, D. (2012). Job Autonomy as a Predictor of Mental Well-Being: The Moderating Role of Quality-Competitive Environment. *Journal of Business and Psychology*, 27(3), 305–316. <https://doi.org/10.1007/s10869-011-9244-3>
- Peters, K. (2001). Die neue Autonomie in der Arbeit. In W. Glißmann & K. Peters (Eds.), *Mehr Druck durch mehr Freiheit: Die neue Autonomie in der Arbeit und ihre paradoxen Folgen* (pp. 18–40). VSA Verlag.
- Peters, K. (2011). Indirekte Steuerung und interessierte Selbstgefährdung: Eine 180-Grad-Wende bei der betrieblichen Gesundheitsförderung. In N. Kratzer, W. Dunkel, K. Becker, & S. Hinrichs (Eds.), *Arbeit und Gesundheit im Konflikt: Analysen und Ansätze für ein partizipatives Gesundheitsmanagement* (pp. 105–122). edition sigma in der Nomos Verlagsgesellschaft.
- Petersen, J., & Melzer, M. (2022a). *Ambulante Pflege in Deutschland: mobil und flexibel* (baua: Fakten). Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). <https://www.baua.de/DE/Angebote/Publikationen/Fakten/Ambulante-Pflege.html>

- Petersen, J., & Melzer, M. (2022b). *Belastungs- und Beanspruchungssituation in der ambulanten Pflege* (baua: Fokus). Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). https://www.baua.de/DE/Angebote/Publicationen/Fokus/Ambulante-Pflege.pdf?__blob=publicationFile&v=4
- Petrakaki, D., & Kornelakis, A. (2016). 'We can only request what's in our protocol': technology and work autonomy in healthcare. *New Technology, Work and Employment*, 31(3), 223–237. <https://doi.org/10.1111/ntwe.12072>
- Pfeiffer, S. (2004). *Arbeitsvermögen: Ein Schlüssel zur Analyse (reflexiver) Informatisierung*. VS Verlag für Sozialwissenschaften.
- Pfeiffer, S. (2018). Technisierung von Arbeit. In F. Böhle, G. G. Voß, & G. Wachtler (Eds.), *Handbuch Arbeitssoziologie: Band 1: Arbeit, Strukturen und Prozesse* (2nd ed., pp. 321–357). Springer VS.
- Pfeiffer, S. (2020). Kontext und KI: Zum Potenzial der Beschäftigten für Künstliche Intelligenz und Machine-Learning. *HMD Praxis Der Wirtschaftsinformatik*, 57(3), 465–479. <https://doi.org/10.1365/S40702-020-00609-8>
- Pfeiffer, S., & Suphan, A. (2015a). *Der AV-Index: Lebendiges Arbeitsvermögen und Erfahrung als Ressourcen auf dem Weg zu Industrie 4.0*. Finalfassung (Working Paper 2015 #1 Finalfassung). Universität Hohenheim, Fg. Soziologie. <https://www.sabine-pfeiffer.de/files/downloads/2015-Pfeiffer-Suphan-final.pdf>
- Pfeiffer, S., & Suphan, A. (2015b). Erfahrungen oder Routine? Ein anderer Blick auf das Verhältnis von Industrie 4.0 und Beschäftigung. *Berufsbildung in Wissenschaft Und Praxis (BWP)*, 44(6), 21–25. <https://www.bwp-zeitschrift.de/dienst/publikationen/de/7851>
- Pichault, F., & McKeown, T. (2019). Autonomy at work in the gig economy: analysing work status, work content and working conditions of independent professionals. *New Technology, Work and Employment*, 34(1), 59–72. <https://doi.org/10.1111/ntwe.12132>
- Polanyi, M. (1966). *The Tacit Dimension* (1st ed.). Doubleday.
- Pongratz, H. J. (2012). Der Dienstleistungscharakter von Arbeit. Eine theoretische Annäherung. In C. Munz, J. Wagner, & E. Hartmann (Eds.), *Beiträge zu Arbeit – Lernen – Persönlichkeitsentwicklung – Band 5. Die Kunst der guten Dienstleistung: Wie man professionelles Dienstleistungshandeln lernen kann* (pp. 17–43). wbv Publikation.
- Pongratz, H. J., & Voß, G. G. (1997). Fremdorganisierte Selbstorganisation. Eine soziologische Diskussion aktueller Managementkonzepte. *Zeitschrift Für Personalforschung*, 11(1), 30–53. <https://doi.org/10.1177/239700229701100102>
- Rammer, C. (2022). *Kompetenzen und Kooperationen zu Künstlicher Intelligenz: Ergebnisse einer Befragung von KI-aktiven Unternehmen in Deutschland*. Bundesministerium für Wirtschaft und Klima (BMWK). https://www.de.digital/DIGITAL/Redaktion/DE/Digitalisierungsindex/Publicationen/publikation-download-ki-kompetenzen.pdf?__blob=publicationFile&v=4

- Rammert, W. (1995). Einleitung. In W. Rammert (Ed.), *Soziologie und künstliche Intelligenz: Produkte und Probleme einer Hochtechnologie* (pp. 7–36). Campus-Verlag.
- Rammert, W. (2003). *Technik in Aktion: Verteiltes Handeln in soziotechnischen Konstellationen* (Technical University Technology Studies Working Papers TUTS-WP-2-2003). Technische Universität Berlin. Institut für Soziologie. https://www.ssoar.info/ssoar/bitstream/handle/document/1157/ssoar-2003-rammert-technik_in_aktion_verteiltes_handeln.pdf?sequence=1&isAllowed=y&lnkname=ssoar-2003-rammert-technik_in_aktion_verteiltes_handeln.pdf
- Rezaev, A. V., Tregubova, N. D., & Starikov, V. S. (2018). Sociological Considerations on Human-Machine Interactions: From Artificial Intelligence to Artificial Sociality. In M. Iklé, A. Franz, R. Rzepka, & B. Goertzel (Eds.), *Lecture notes in computer science Lecture notes in artificial intelligence: Vol. 10999. Artificial general intelligence: 11th International Conference, AGI 2018, Prague, Czech Republic, August 22–25, 2018 : Proceedings* (pp. 364–371). Springer.
- Ribbat, M., Weber, C., Tisch, A., & Steinmann, B. (2021). *Führen und Managen im digitalen Wandel: Anforderungen und Ressourcen* (baua: Preprint). Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). <https://www.baua.de/DE/Angebote/Publicationen/Preprint/Fuehrung.html>
- Rifkin, J. (1995). *The End of Work: The Decline of the Global Labor Force and the Dawn of the Post-Market Era*. Putnam.
- Rohrbach-Schmidt, D., & Hall, A. (2013). *BIBB/BAuA-Erwerbstätigenbefragung 2012: BIBB-FDZ Daten- und Methodenberichte* (Nr. 1/2013). Bundesinstitut für Berufsbildung (BIBB). <https://www.bibb.de/dienst/veroeffentlichungen/de/publication/download/7093>
- Rohrbach-Schmidt, D., & Hall, A. (2020). *BIBB/BAuA-Erwerbstätigenbefragung 2018: Daten- und Methodenbericht* (Heft 1/2020). Bundesinstitut für Berufsbildung (BIBB). <https://www.bibb.de/dienst/publikationen/de/download/16401>
- Rösler, U., Schmidt, K., Merda, M., & Melzer, M. (2018). *Digitalisierung in der Pflege: Wie intelligente Technologien die Arbeit professionell Pflegenden verändern*. Initiative Neue Qualität der Arbeit (INQA). https://www.inqa.de/SharedDocs/downloads/digitalisierung-in-der-pflege.pdf?__blob=publication-File
- Roth, I. (2012). *Die Arbeitsbedingungen im Finanzdienstleistungssektor* (Arbeitsberichterstattung aus der Sicht der Beschäftigten). Vereinte Dienstleistungsgewerkschaft (ver.di). Bereich Innovation und Gute Arbeit (Ed.). <https://innovation-gute-arbeit.verdi.de/++file++53edcb3dba949b0740000514/download/Arbeitsbedingungen%20im%20Finanzdienstleistungssektor.pdf>
- Roth, I. (2019). *Vereinbarkeit von Erwerbsarbeit und Sorgearbeit im Dienstleistungssektor: Eine Sonderauswertung auf Grundlage des DGB-Index*

- Gute Arbeit* 2017. Vereinte Dienstleistungsgewerkschaft (ver.di). Bereich Innovation und Gute Arbeit. [https://innovation-gute-arbeit.verdi.de/++file++5d05fecc599bfb54b4627b56/download/Studie % 20Vereinbarkeit % 20Erwerbs-%20und%20Sorgearbeit.pdf](https://innovation-gute-arbeit.verdi.de/++file++5d05fecc599bfb54b4627b56/download/Studie%20Vereinbarkeit%20Erwerbs-%20und%20Sorgearbeit.pdf)
- Roth, I., & Müller, N. (2016). *Digitalisierung und Arbeitsqualität: Eine Sonderauswertung auf Basis des DGB-Index Gute Arbeit 2016 für den Dienstleistungssektor*. Vereinte Dienstleistungsgewerkschaft (ver.di). Bereich Innovation und Gute Arbeit. https://innovation-gute-arbeit.verdi.de/++file++592fd69d086c2653a7bb5b05/download/digitalverdi_web.cleaned.pdf
- Roth, I., Zanker, C., Martinetz, S., & Schnalzer, K. (2015). *Digitalisierung bei Logistik, Handel und Finanzdienstleistungen: Technologische Trends und ihre Auswirkungen auf Arbeit und Qualifizierung*. Vereinte Dienstleistungsgewerkschaft (Ed.). https://innovation-gute-arbeit.verdi.de/++file++56cb1e79890e9b06ac000a73/download/ProMit-Studie_Digitalisierung_Web_2015.pdf
- Ryan, R. M., & Deci, E. L. (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037//0003-066x.55.1.68>
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, 57(6), 1069–1081. <https://doi.org/10.1037/0022-3514.57.6.1069>
- Saborowski, M., & Kollak, I. (2015). “How do you care for technology?” – Care professionals’ experiences with assistive technology in care of the elderly. *Technological Forecasting and Social Change*, 93, 133–140. <https://doi.org/10.1016/j.techfore.2014.05.006>
- Saragih, S. (2011). The Effects of Job Autonomy on Work Outcomes: Self Efficacy as an Intervening Variable. *International Research Journal of Business Studies*, 4(3), 203–215. <https://doi.org/10.21632/irjbs.4.3.203-215>
- Sävenstedt, S., Sandman, P. O., & Zingmark, K. (2006). The duality in using information and communication technology in elder care. *Journal of Advanced Nursing*, 56(1), 17–25. <https://doi.org/10.1111/j.1365-2648.2006.03975.x>
- Schaupp, S. (2020). Taylorismus oder Kybernetik? Eine kurze Ideengeschichte der algorithmischen Arbeitssteuerung. *WSI Mitteilungen*, 73(3), 201–208. <https://doi.org/10.5771/0342-300X-2020-3-201>
- Schaupp, S. (2021). *Technopolitik von unten: Algorithmische Arbeitssteuerung und kybernetische Proletarisierung* (1st ed.). Batterien: NF, 106. Matthes & Seitz.
- Schieman, S. (2013). Job-related resources and the pressures of working life. *Social Science Research*, 42(2), 271–282. <https://doi.org/10.1016/j.ssresearch.2012.10.003>
- Schildmann, C., & Voss, D. (2018). *Aufwertung von sozialen Dienstleistungen: Warum sie notwendig ist und welche Stolpersteine noch auf dem Weg liegen*

- (Forschungsförderung Report Nr.4). Hans-Böckler-Stiftung (HBS). https://www.boeckler.de/pdf/p_fofoe_report_004_2018.pdf
- Schlicht, L., Melzer, M., & Rösler, U. (2021). *Personenbezogene Tätigkeiten im digitalen Wandel: Arbeitsmerkmale und Technologieeinsatz* (baua: Preprint). Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). <https://www.baua.de/DE/Angebote/Publicationen/Berichte/F2353-1f.html>
- Schöllgen, I., & Schulz, A. (2016). *Psychische Gesundheit in der Arbeitswelt: Emotionsarbeit* (baua: Bericht Forschung Projekt F 2353). Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). <https://www.baua.de/DE/Angebote/Publicationen/Berichte/F2353-1f.html>
- Schreyer, J., & Schrape, J.-F. (2021). Plattformzentrierte Arbeitskoordination im kommerziellen und kooperativen Fahrradkurierwesen. *Arbeit*, 30(4), 283–306. <https://doi.org/10.1515/arbeit-2021-0020>
- Schwartz, M., Dapp, T. F., Beck, G. W., & Khussainova, A. (2017). *Deutschlands Banken schalten bei Filialschließungen einen Gang höher – Herkulesaufgabe Digitalisierung* (Fokus Volkswirtschaft Nr. 181). KfW Research. <https://www.kfw.de/PDF/Download-Center/Konzernthemen/Research/PDF-Dokumente-Fokus-Volkswirtschaft/Fokus-2017/Fokus-Nr.-181-Oktober-2017-Bankfilialen.pdf>
- Schwartz, R. D. (1989). Artificial Intelligence as a Sociological Phenomenon. *Canadian Journal of Sociology*, 14(2), 179–202. <https://doi.org/10.2307/3341290>
- Searle, J. R. (1980). Minds, brains, and programs. *Behavioral and Brain Sciences*, 3(3), 417–424. <https://doi.org/10.1017/S0140525X00005756>
- Senghaas-Knobloch, E. (2008). *Wohin driftet die Arbeitswelt?* (1st ed.). VS Verlag für Sozialwissenschaften.
- Senghaas-Knobloch, E. (2011). Arbeitskraft ist mehr als eine Ware. Arbeiten in der postfordistischen Dienstleistungsgesellschaft. In Bundeszentrale für politische Bildung (Ed.), *Aus Politik und Zeitgeschichte (APuZ): 15/2011. Humanisierung der Arbeit* (24–31).
- Sheridan, T. B. (1991). Automation, Authority and Angst — Revisited. *Proceedings of the Human Factors Society Annual Meeting*, 35(1), 2–6. <https://doi.org/10.1177/154193129103500103>
- Sheridan, T. B. (1992). *Telerobotics, Automation, and Human Supervisory Control*. MIT Press.
- Sia, S. K., & Appu, A. V. (2015). Work Autonomy and Workplace Creativity: Moderating Role of Task Complexity. *Global Business Review*, 16(5), 772–784. <https://doi.org/10.1177/0972150915591435>
- Sichler, R. (2005). Autonomie im Kontext der Entgrenzung von Arbeit und Lebensführung: Entwurf einer sozialphilosophisch begründeten Perspektive. *Journal Für Psychologie*, 13(1–2), 104–126. <https://nbn-resolving.org/urn:nbn:de:0168-ssoar-17200>

- Sichler, R. (2006). *Autonomie in der Arbeitswelt. Psychologie und Beruf: Vol. 6.* Vandenhoeck & Ruprecht.
- Sims, H. P., Szilagyi, A. D., & Keller, R. T. (1976). The Measurement of Job Characteristics. *Academy of Management Journal*, 19(2), 195–212. https://www.researchgate.net/publication/22126385_The_Measurement_of_Job_Characteristics
- Slater, B. (1968). On the line. In R. Fraser (Ed.), *Work: Twenty Personal Accounts* (pp. 95–105). Penguin Books.
- Sousa, C. M. P., Coelho, F., & Guillaumon-Saorin, E. (2012). Personal Values, Autonomy, and Self-efficacy: Evidence from frontline service employees. *International Journal of Selection and Assessment*, 20(2), 159–170. <https://doi.org/10.1111/j.1468-2389.2012.00589.x>
- Spector, P. E. (1986). Perceived Control by Employees: A Meta-Analysis of Studies Concerning Autonomy and Participation at Work. *Human Relations*, 39(11), 1005–1016. <https://doi.org/10.1177/001872678603901104>
- Spiegelaere, S. de, van Gyes, G., & van Hootegem, G. (2016). Not All Autonomy is the Same. Different Dimensions of Job Autonomy and Their Relation to Work Engagement & Innovative Work Behavior. *Human Factors and Ergonomics in Manufacturing & Service Industries*, 26(4), 515–527. <https://doi.org/10.1002/hfm.20666>
- Squicciarini, M., & Nachtigall, H. (2021). *Demand for AI skills in jobs: Evidence from online job postings* (OECD Science, Technology and Industry Working Papers 2021/03). OECD Publishing (Ed.). <https://www.oecd-ilibrary.org/docserver/3ed32d94-en.pdf?expires=1699441063&id=id&accname=guest&checksum=AEAB5F0E2A4332B6282B42AD0E9851FD>
- Staab, P., & Nachtwey, O. (2016). Die Digitalisierung der Dienstleistungsarbeit. In Bundeszentrale für politische Bildung (Ed.), *Aus Politik und Zeitgeschichte (APuZ): 66. Jahrgang. 18–19/2016. Arbeit und Digitalisierung* (pp. 24–31).
- Stadler, B. (2019). Intensivierung und Flexibilisierung von Arbeitszeiten: Wirkungen auf gesundheit und Zufriedenheit. In M. Griesbacher, J. Hödl, J. Muckenhuber, & K. Scaria-Braunstein (Eds.), *Intensivierung der Arbeit: Perspektiven auf Arbeitszeit und technologischen Wandel* (pp. 60–72). new academic press.
- Statistisches Bundesamt. (n.d.). *Wirtschaftsabschnitte des Dienstleistungssektors*. Retrieved November 30, 2023, from <https://www.destatis.de/DE/Themen/Branchen-Unternehmen/Dienstleistungen/Methoden/Erlaeuterungen/dienstleistungen-allgemein.html?nn=206984>
- Statistisches Bundesamt (Destatis). (2008a). *Klassifikation der Wirtschaftszweige: Mit Erläuterungen*. https://www.destatis.de/DE/Methoden/Klassifikationen/Gueter-Wirtschaftsklassifikationen/Downloads/klassifikation-wz-2008-3100100089004-aktuell.pdf?__blob=publicationFile
- Statistisches Bundesamt. (2008b, June 30). *Englische Fassung: German Classification of Economic Activities*. <https://www.destatis.de/DE/Methoden/Klassi->

- fikationen/Gueter-Wirtschaftsklassifikationen/Downloads/klassifikation-wz-2008-englisch.html
- Statistisches Bundesamt. (2020, November 25). *Arbeitszeitwünsche 2019: Knapp 2,1 Millionen Erwerbstätige wollten mehr, 1,5 Millionen wollten weniger arbeiten*. Pressemitteilung Nr. 468 [Press release]. https://www.destatis.de/DE/Presse/Pressemitteilungen/2020/11/PD20_468_133.html
- Statistisches Bundesamt. (2023a, January 26). *Gesundheitspersonalberechnung: Gesundheitspersonal in 1.000. Gliederungsmerkmale: Jahre, Deutschland, Geschlecht, Einrichtung, Beruf*. https://www.gbe-bund.de/gbe/pkg_isgbe5.prc_menu_olap?p_uid=gast&p_aid=2447484&p_sprache=D&p_help=2&p_indnr=89&p_indsp=&p_ityp=H&p_fid=
- Statistisches Bundesamt. (2023b, March 30). *Gesundheitsberichterstattung: Ambulante Pflege- und Betreuungsdienste und von ambulanten Pflege- und Betreuungsdiensten betreute Pflegebedürftige (Anzahl und Dichte). Gliederungsmerkmale: Jahre, Region, Träger*. https://www.gbe-bund.de/gbe/pkg_isgbe5.prc_menu_olap?p_uid=gast&p_aid=65455469&p_sprache=D&p_help=2&p_indnr=571&p_indsp=1048&p_ityp=H&p_fid=
- Stone, P., Brooks, R., Brynjolfsson, E., Calo, R., Etzioni, O., Hager, G., Hirschberg, J., Kalyanakrishnan, S., Kamar, E., Kraus, S., Leyton-Brown, K., Parkes, D., Press, W., Saxenian, A., Shah, J., Tambe, M., & Teller, A. (2016). *Artificial Intelligence and Life in 2030: One Hundred Year Study on Artificial Intelligence: Report of the 2015–2016 Study Panel*. Stanford University. https://ai100.stanford.edu/sites/g/files/sbiybj18871/files/media/file/ai100report10032016fnl_singles.pdf
- Susskind, R., & Susskind, D. (2015). *The Future of the Professions* (1st ed.). Oxford University Press.
- Taylor, F. W. (1911). *The Principles of Scientific Management* (1st ed.). Harper & Brothers.
- Techniker Krankenkasse (TK). (2019). *Gesundheitsreport: Pflegefall Pflegebranche? So geht's Deutschlands Pflegekräften*. <https://www.tk.de/resource/blob/2066542/2690efe8e801ae831e65fd251cc77223/gesundheitsreport-2019-data.pdf>
- Tegtmeyer, P. (2021). *Informationsbezogene Tätigkeiten im digitalen Wandel: Arbeitsmerkmale und Technologieeinsatz* (buaa: Preprint). Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). <https://www.buaa.de/DE/Angebote/Publikationen/Preprint/Informationsbezogene-Taetigkeiten.html>
- Terhoeven, J. (2021). *Objektbezogene Tätigkeiten im digitalen Wandel: Arbeitsmerkmale und Technologieeinsatz* (buaa: Preprint). Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). <https://www.buaa.de/DE/Angebote/Publikationen/Preprint/Objektbezogene-Taetigkeiten.html>
- Terry, E., Marks, A., Dakessian, A., & Christopoulos, D. (2022). Emotional Labour and the Autonomy of Dependent Self-Employed Workers: The Limitations of Digital Managerial Control in the Home Credit Sector.

- Work, Employment and Society*, 36(4), 665–682. <https://doi.org/10.1177/0950017020979504>
- Thompson, P. (2010). The capitalist labour process: Concepts and connections. *Capital & Class*, 34(1), 7–14. <https://doi.org/10.1177/0309816809353475>
- Tisch, A., Beermann, B., Wünnemann, L., & Windel, A. (2020). Interaktionsarbeit: Herausforderung für die arbeitswissenschaftliche Forschung. *Zeitschrift Für Arbeitswissenschaft*, 74(1), 44–51. <https://doi.org/10.1007/s41449-020-00185-z>
- Tisch, A., & Meyer, S.-C. (2020). Chancen und Risiken der Digitalisierung in den beruflichen Tätigkeitsfeldern Pflegen, Betreuen und Heilen. *Bundesgesundheitsblatt – Gesundheitsforschung – Gesundheitsschutz*, 63(6), 690–697. <https://doi.org/10.1007/s00103-020-03160-5>
- Tolan, S., Pesole, A., Martínez-Plumed, F., Fernández-Macías, E., Hernández-Orallo, J., & Gómez, E. (2021). Measuring the Occupational Impact of AI: Tasks, Cognitive Abilities and AI Benchmarks. *Journal of Artificial Intelligence Research*, 71, 191–236. <https://doi.org/10.1613/jair.1.12647>
- Turing, A. M. (1950). Computing machinery and intelligence. *Mind*, LIX(236), 433–460. <https://doi.org/10.1093/mind/LIX.236.433>
- Ulich, E. (1988). Arbeits- und organisationspsychologische Aspekte. In H. Balzert, H. U. Hoppe, R. Oppermann, H. Peschke, G. Rohr, & N. A. Streitz (Eds.), *Mensch, Computer, Kommunikation – Grundwissen: Vol. 1. Einführung in die Software-Ergonomie* (pp. 49–66). De Gruyter.
- Ulich, E. (2001). *Arbeitspsychologie* (5th ed.). Schäffer-Poeschel.
- van den Broeck, A., Ferris, D. L., Chang, C.-H., & Rosen, C. C. (2016). A Review of Self-Determination Theory's Basic Psychological Needs at Work. *Journal of Management*, 42(5), 1195–1229. <https://doi.org/10.1177/0149206316632058>
- van Geenen, W., Dorschel, W., & Dorschel, J. (2015). Big Data in der Kreditwirtschaft. In J. Dorschel (Ed.), *Praxishandbuch Big Data: Wirtschaft – Recht – Technik* (pp. 134–148). Springer Gabler.
- van Mierlo, H., Rutte, C. G., Vermunt, J. K., Kompier, M. A. J., & Doorewaard, J. A. M. C. (2006). Individual autonomy in work teams: The role of team autonomy, self-efficacy, and social support. *European Journal of Work and Organizational Psychology*, 15(3), 281–299. <https://doi.org/10.1080/13594320500412249>
- van Overbeke, T. (2022). (De)regulating automation: the rise of credit scoring and market-led banking in the UK and Germany. *Comparative European Politics*. Advance online publication. <https://doi.org/10.1057/s41295-022-00292-7>
- van Yperen, N. W., Rietzschel, E. F., & Jonge, K. M. M. de (2014). Blended Working: For Whom It May (Not) Work. *PloS One*, 9(7), e102921. <https://doi.org/10.1371/journal.pone.0102921>
- Vieth, P. (1995). *Kontrollierte Autonomie: Neue Herausforderungen für die Arbeitspsychologie*. Asanger.

- Voß, G. G. (1998). Die Entgrenzung von Arbeit und Arbeitskraft: Eine subjektorientierte Interpretation des Wandels der Arbeit. *Mitteilungen Aus Der Arbeitsmarkt- Und Berufsforschung*, 31, 473–487. https://doku.iab.de/mittab/1998/1998_3_MittAB_Voss.pdf
- Voß, G. G. (2007). Subjektivierung von Arbeit und Arbeitskraft. Die Zukunft der Beruflichkeit und die Dimension Gender als Beispiel. In B. Aulenbacher, M. Funder, H. Jacobsen, & S. Völker (Eds.), *Geschlecht und Gesellschaft: Vol. 40. Arbeit und Geschlecht im Umbruch der modernen Gesellschaft: Forschung im Dialog* (1st ed., pp. 97–113). VS Verlag für Sozialwissenschaften.
- Voß, G. G. (2012). Subjektivierter Professionalität. Zur Selbstprofessionalisierung von Arbeitskraftunternehmen und arbeitenden Kunden. In W. Dunkel & M. Wehrich (Eds.), *Interaktive Arbeit: Theorie, Praxis und Gestaltung von Dienstleistungsbeziehungen* (pp. 353–386). Springer VS.
- Voß, G. G., & Pongratz, H. J. (1998). Der Arbeitskraftunternehmer: Eine Neue Grundform der Ware Arbeitskraft? *Kölner Zeitschrift Für Soziologie Und Sozialpsychologie*, 50(1), 131–158. <https://ggv-webinfo.de/wp-content/uploads/2016/05/AKUKZfSS-Original-neu-formatiert-mit-Abb-1.pdf>
- Voß, G. G., & Weiß, C. (2005). Subjektivierung von Arbeit – Subjektivierung von Arbeitskraft. In I. Kurz-Scherf, L. Correll, & S. Janczyk (Eds.), *Arbeit – Demokratie – Geschlecht: Vol. 4. In Arbeit: Zukunft: Die Zukunft der Arbeit und der Arbeitsforschung liegt in ihrem Wandel* (1st ed., pp. 139–155). Westfälisches Dampfboot.
- Voydanoff, P. (2004). Implications of Work and Community Demands and Resources for Work-to-Family Conflict and Facilitation. *Journal of Occupational Health Psychology*, 9(4), 275–285. <https://doi.org/10.1037/1076-8998.9.4.275>
- Wajcman, J. (2017). Automation: Is it really different this time? *The British Journal of Sociology*, 68(1), 119–127. <https://doi.org/10.1111/1468-4446.12239>
- Waltersbacher, A., Maisuradze, M., & Schröder, H. (2019). Arbeitszeit und Arbeitsort – (wie viel) Flexibilität ist gesund? Ergebnisse einer repräsentativen Befragung unter Erwerbstätigen zu mobiler Arbeit und gesundheitlichen Beschwerden. In B. Badura, A. Ducki, & H. Schröder (Eds.), *Fehlzeiten-Report 2019: Digitalisierung – gesundes Arbeiten ermöglichen* (pp. 77–107). Springer.
- Warhurst, C., Wright, S., & Lyonette, C. (2017). *Understanding and measuring job quality: Research report – Part 1 – Thematic literature review*. Chartered Institute of Personnel and Development (CIPD). https://www.cipd.org/global-assets/media/knowledge/knowledge-hub/reports/understanding-and-measuring-job-quality-3_tcm18-33193.pdf
- Warr, P. B. (1994). A conceptual framework for the study of work and mental health. *Work & Stress*, 8(2), 84–97. <https://doi.org/10.1080/02678379408259982>

- Webb, M. (2019). The Impact of Artificial Intelligence on the Labor Market. *SSRN Electronic Journal*. Advance online publication. <https://doi.org/10.2139/ssrn.3482150>
- Weber, K., Haug, S., Lauer, N., Meusslin-Sentpali, A., Mohr, C., Pflingsten, A., Raptis, G., & Bahr, G. (Eds.). (2022). *Regensburger Beiträge zur Digitalisierung des Gesundheitswesens: Vol.1. Digitale Technik für ambulante Pflege und Therapie: Herausforderungen, Lösungen, Anwendungen und Forschungsperspektiven*. transcript Verlag.
- Weizenbaum, J. (1976). *Computer Power and Human Reason: From Judgment to Calculation*. W. H. Freeman and Company.
- Weltz, F. (1999). Der Traum von der absoluten Ordnung und die doppelte Wirklichkeit der Unternehmen. In E. Hildebrandt (Ed.), *Betriebliche Sozialverfassung unter Veränderungsdruck* (pp. 85–97). edition sigma in der Nomos Verlagsgesellschaft.
- Wheatley, D. (2017). Autonomy in Paid Work and Employee Subjective Well-Being. *Work and Occupations*, 44(3), 296–328. <https://doi.org/10.1177/0730888417697232>
- Wielenga-Meijer, E. G., Taris, T. W., Wigboldus, D. H., & Kompier, M. A. J. (2012). Don't bother me: learning as a function of task autonomy and cognitive demands. *Human Resource Development International*, 15(1), 5–23. <https://doi.org/10.1080/13678868.2011.646898>
- Wiener, N. (1948). *Cybernetics: Or Control and Communication in the Animal and the Machine* (1st ed.). Hermann & Cie Editeurs; MIT Press.
- Winker, G., & Carstensen, T. (2007). Eigenverantwortung in Beruf und Familie – vom Arbeitskraftunternehmer zur Arbeitskraftmanagerin. *Feministische Studien*, 25(2), 277–288. <https://doi.org/10.1515/fs-2007-0210>
- Wöhrmann, A. M., Backhaus, N., Tisch, A., & Michel, A. (2020). *BAuA-Arbeitszeitbefragung: Pendeln, Telearbeit, Dienstreisen, wechselnde und mobile Arbeitsorte: Forschung Projekt F 2452* (baua: Bericht). Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). <https://www.baua.de/DE/Angebote/Publikationen/Berichte/F2452.html>
- Wöhrmann, A. M., Gerstenberg, S., Hünefeld, L., Pundt, F., Reeske-Behrens, A., Brenscheidt, F., & Beermann, B. (2016). *Arbeitszeitreport Deutschland 2016*. Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA). <https://www.baua.de/DE/Angebote/Publikationen/Berichte/F2398.html>
- Wolf-Ostermann, K., Fürstenau, D., Theune, S., Bergmann, L., Biesmann, F., Domhoff, D., Schulte-Althoff, M., & Seibert, K. (2021). *Konzept zur Einbettung von KI-Systemen in der Pflege: Sondierungsprojekt zu KI in der Pflege (SoKIP)*. Universität Bremen. Einstein Center Digital Future (ECDF). Verband für Digitalisierung in der Sozialwirtschaft e.V. (vediso). https://media.suub.uni-bremen.de/bitstream/elib/4699/4/SoKIP_Konzept%20zur%20Einbettung%20von%20KI%20Systemen%20in%20der%20Pflege.pdf

- Woolgar, S. (1985). Why not a Sociology of Machines? The Case of Sociology and Artificial Intelligence. *Sociology*, 19(4), 557–572. <https://doi.org/10.1177/0038038585019004005>
- Wotschack, W. (1987). *Vom Taylorismus zur kontrollierten Autonomie. Über Personaleinsatzkonzepte und Arbeitsanforderungen bei neuen Technologien* (Publication series of the International Institute for Comparative Social Research/Labor Policy IIVG/dp87-205). Wissenschaftszentrum Berlin für Sozialforschung (WZB). <https://bibliothek.wzb.eu/pdf/1987/iivg-dp87-205.pdf>
- Zanker, C., & Drick, K.-J. (2011). Die Qualität der Arbeit im Bankensektor: Zwischen Restrukturierung, Renditedruck und Finanzmarktkrise – empirische Befunde. In L. Schröder & H.-J. Urban (Eds.), *ver.di-Sonderausgabe 2011. Jahrbuch Gute Arbeit 2011: Folgen der Krise, Arbeitsintensivierung, Restrukturierung* (pp. 131–141). Bund Verlag.
- Zanker, C., Roth, I., & Hoppe, M. (2019). *ver.di-Innovationsbarometer 2019: Künstliche Intelligenz*. Vereinte Dienstleistungsgewerkschaft (ver.di). Bereich Innovation und Gute Arbeit. https://innovation-gute-arbeit.verdi.de/++file++5dd3f17cd62276747746838b/download/innobaro_KI_RZweb3.pdf
- Zerfaß, K. (2016). Möglichkeiten der Ausgestaltung eines bankbetrieblichen Produktportfolios aus Sicht einer Universalbank. In D. Hellenkamp & K. Fürderer (Eds.), *Handbuch Bankvertrieb: Theorie und Praxis im Zukunftsdialog* (pp. 189–208). Springer Gabler.
- Zerilli, J., Knott, A., Maclaurin, J., & Gavaghan, C. (2019). Algorithmic Decision-Making and the Control Problem. *Minds & Machines*, 29(4), 555–578. <https://doi.org/10.1007/s11023-019-09513-7>
- Zuboff, S. (1988). *In the Age of the Smart Machine: The Future of Work and Power*. Basic Books.
- Zweig, K. A. (2019). *Ein Algorithmus hat kein Taktgefühl: Wo künstliche Intelligenz sich irrt, warum uns das betrifft und was wir dagegen tun können*. Heyne Verlag.