Where Do You Cry In An Open Plan Office? A Historiography of Interior Office Design

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Introduction: The Office-What's Design Got To Do, Got To Do With It?

Day in and day out millions of people walk into offices and settle in for a day at work. Over the past hundred years as a greater number of individuals have entered the workforce, and as the Western economy has migrated away from manufacturing, the banality of the office has become reality to an ever-increasing segment of the population. From 8am to 6pm, the office mediates the life experience of white-collar workers, mediating their relationship to, and understanding of, work and life. In the words of Britain's foremost office architect and historian, Francis Duffy, 'Never before... has the office building been so central to society nor loaded with such significance.'[1]

Despite the office's serving as a foundational vector for day-to-day life, comparatively little has been written about its interior design.[2] Much of the available literature on office interiors is comprised mainly of large, image-dense books highlighting expensive, unique, highly stylized offices designed by big-name architects and interior designers.[3] While beautiful, these volumes provide little insight into the design, functionality, and experience of the vast majority of office spaces. Also published, although in smaller numbers, are technical books directed towards the architectural community. Books written for a general audience, including office workers, are published in smaller numbers yet.[4] It is literature in this final category which this historiography addresses.

It is possible to situate literature on office interiors into three roughly defined schools of thought and influence: architecture, psychology, and labor studies. Each school approaches office space and design from the vantage point of their profession, focusing on particular factors of change and minimizing others. While architects are particularly interested in technology and physical elements of the offices, psychologists are interested in practicality and efficiency, and Marxists focus on the office as it exists vis-a-vis capitalism, exploitation and labor. Such profession-specific approaches to the study of the office create zones which are densely commented upon while simultaneously leaving significant gaps in extant literature. Despite the office existing both as a physical space, *and* a site of labor, it has infrequently been analyzed and researched as both in any given piece of literature.

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[1] Francis Duffy, *The Changing Workplace*, ed. by Patrick Hannay (London: Phadion, 1992), p. 125.
[2] *The Changing Workplace*, p. x.
[3] Franklin Becker and Fritz Steele, *Workplace by Design: Mapping the High-Performance Workscape* (San Francisco: Jossey-Bass, 1995), p. x-xi.
[4] Becker and Steele, p. xi.

Additionally, few office design commentators have experienced working in the environments they are documenting, analyzing, and critiquing. Many authors writing on office interior design appear to be uninterested in experiencing firsthand the designs and spaces which they are writing about, preferring instead to observe or interact conceptually with them. This lack of practical office experience leads to many writings on the subject ignoring the human and lived element of the office - how it is used, how it is felt, and how it contributes to the self-image of those who work within these spaces. In the words of *Dilbert* creator Adam Scott, reading office histories is frequently akin to reading accounts of the Donner party by authors whose primary credential is that they have eaten beef jerky.[5]

A Very Brief History of Office Design

The Western office has a history of design seemingly intended to make the occupants of office spaces unhappy, uncomfortable, and unvalued. Despite changes in appearance and functionality, some concepts have remained constant - lack of personal space, lack of privacy, and top-down implementation of design changes.

The Office: Origins

Prior to the proliferation of paperwork associated with the Industrial Revolution, administrative work frequently took place in semi-public, 'in the homes of merchants or in coffee houses and in the market place.'[6] In these spaces the owner/capitalist frequently ran his own enterprises, '...wrote his own letters, visited his own customers, and belaboured his men with his own walking stick.'[7] Without the need for permanent administrative employees there was no need for dedicated office space; even Lloyd's of London called a coffee house its first 'office'.[8] During this era, the office could look like almost anything - a home study, a coffee shop, a pub, or a small room attached to a mill or industrial plant.[9]

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[5] Nikil Saval, *Cubed: A Secret History of the Workplace* (London: Doubleday, 2014), p. 244.

[6] Alan Delgado, *The Enormous File: A Social History of the Office* (London: John Murray, 1979), p. 11.

[7] The same concept is explored in both Harry Braverman, *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century* (London: Monthly Review Press, 1974), p. 260. and Gideon Haigh, *The Office: A Hardworking History* (Melbourne: Miegunyah Press, 2012), p. 27.

[8] Eric Sundstrom and Mary Graehl Sundstrom, *Work Places: The Psychology of the Physical Environment in Offices and Factories* (Cambridge: Cambridge University Press, 1986), p. 26.

[9] Sundstrom, p. 25.

The Office Comes of Age - The Larkin Administration Building

As the scale of capitalism grew, so too did the quantity of administrative work needed to keep businesses operating. With this increase of administrative work came parallel growth in administrative staff, and in turn, an increased need for space in which these new staff could work. It is out of this need that the corporate office was born.

Emblematic of the turn of the century office is Frank Lloyd Wright's Larkin Administration building in Buffalo, New York.[10] The 1906 Larkin building was a 'a highly efficient machine of work' designed to accommodate hundreds of clerks seated in neat even lines, facing a floor supervisor.[11] True to Frank Lloyd Wright's design oeuvre and the approach to designing office space in the early twentieth century, there was little possibility of user modulation of the space - 'clerks sat on fixed seats that pivoted from their desks', restricting movement, and decreasing comfort.[12] This was typical for the period - interior office design created to fulfill a function, spaces which prioritized efficiency over worker comfort. Even the desks were designed to be cleared at the end of the day, preventing workers from personalizing their work stations.[13]

Figure 1, Frank Lloyd Wright Larkin Administration Building Interior

The Larkin-style office, with a strong 'culture of supervisory control', was considered to be effective and was widely accepted in its time.[14] However as the twentieth century unfolded, this approach to office design would need to change.

[10] Juriaan van Meel, *The European Office: Office Design and National Context* (Rotterdam: 010 Publishers, 2000).
[11] *On the Job: Design and the American Office*, ed. by Donald Albrecht and Chrysanthane B. Broikos (New York: Princeton Architectural Press, 2000), p. 50.
[12] Jack Quinan, *Frank Lloyd Wright's Larkin Building: Myth and Fact* (London: The MIT Press, 1987), p. 63.
[13] Quinan, p. 152.
[14] Jeremy Myerson and Imogen Privett, *Life of Work: What Office Design Can Learn from the World Around Us* (London: Black Dog Publishing, 2015), p. 21.

Bürolandschaft - The "Modern" Office

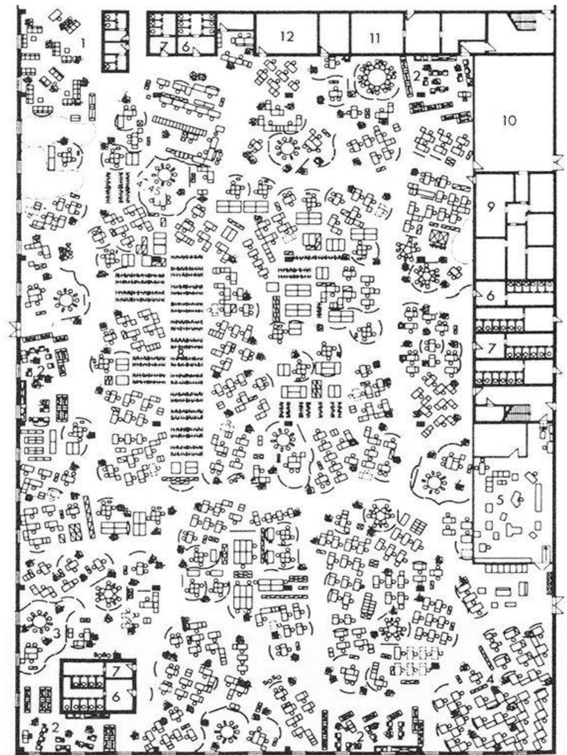

Figure 2, Bürolandschaft Office Floorplan

Throughout the first half of the twentieth century office design stayed relatively static; the open plans and desks conforming to straight lines of sight continued to dominate the market. Significant change was first introduced by the Quickborner Group in 1958 in the form of the Bürolandschaft office design concept. Bürolandschaft (Office Landscaping) entailed the strategic arrangement of large open-plan spaces, with desks and plants placed at odd angles to break up sightlines, carpeting and acoustic ceilings to absorb sound, and sophisticated heating and cooling systems maintaining an even temperature.[15] Compared to the rigidly delineated and controlled offices of the preceding fifty years, Landscaped offices promised an experience which was 'flexible and human again'.[16] The modern-styled desks, heavy carpeting, and irregular placement of furniture was seen by many designers as a significant solution to the 'physical problems of noise and distraction inherent in the open plan' and progress toward 'the work utopia...always promised'.[17]

Robert Propst, Herman Miller and Action Office I and II

Heavily inspired by Bürolandschaft, Robert Probst, director of Herman Miller's Research Corporation, launched an extensive survey of the needs and behaviors of modern office workers.[18] Propst was intent on designing more suitable office furniture for the mid-twentieth

[15] *The Changing Workplace*, p. 11.
[16] *The Changing Workplace*, p. 79.
[17] *The Changing Workplace*, p. 12. Also discussed Saval, p. 208.
[18] *On the Job: Design and the American Office*, p. 89.

Figure 3, Promotional Image of Action Office I

century workplace. The resulting product was Action Office I, a set of modular office furniture which streamlined and modernized office design, eliminated excess storage, and created privacy for its users.[19]

Action Office I (AOI) was a critical hit upon its 1964 release, earning praise from *Industrial Design* and the *Saturday Evening Post* for its comfort and ability to increase efficiency but unfortunately, failed to sell a significant number of units and was ultimately a commercial flop.[20] Unperturbed, Propst returned to the drawing board and in 1968 debuted Action Office II. This design was built on the same principles but was constructed using less expensive materials. Notably, Action Office II also incorporated a partition system, which added increased modularity and potential for additional privacy.[21] Action Office II rapidly gained in popularity, and like its predecessor was seen by many in the design community to have 'supported a new degree of human dignity and control at an individual level.'[22]

Figure 4, Promotional Image of Action Office II

In practice Propst's designs for a revolutionary, liberating office had the opposite effect. As Action Office II increased in popularity, suspiciously similar systems became available from other commercial furniture companies. These copies lacked Propst's color, taste, and humanity. It became clear that despite of its modern and revolutionary appearance the Action Office

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[19] Saval, p. 207.
[20] Haigh, p. 269.
Industrial Design 'Seeing these designs, one wonders why office workers have put up with their incompatible, uncomfortable environment for so long'
Saturday Evening Post 'So, office workers of America, beware! The action office is coming! We are in real danger of being enabled to work at 100 percent efficiency.'
[21] Robert Propst, *The Office: A Facility Based on Change* ([n.p.]: Herman Miller, 1968), p. 71.
[22] *Workspheres: Design and Contemporary Work Styles*, ed. by Paola Antonelli (New York: Museum of Modern Art, 2001), p. 29.

still 'also allowed for extreme cellularization, standardization, anonymity, and conformity'.[23]

The Cubicle

The commercial evolution of Action Office II is perhaps the best-known concept in office design - the cubicle. 'In the years to follow (the introduction of Action Office II), blanket approaches to liter warehousing of people and universal applications...would ignore the individual.... The cubicle would come to represent a form of individual housing that neither provided privacy nor fostered interaction' - the worst of both worlds.[24] The cubicle was so successful that roughly a decade after its introduction over 35 million workers in the United States were estimated to call one their work home-away-from-home.[25]

The cubicle is ubiquitous enough that it almost needs no explanation - grey fabric panels dividing working areas into small sections, open on one side. These cubes are repeated, creating a sea of grey cells each containing identical desks and chairs.[26]

Figure 5, Still Frame of Cubicle Office Design from *Office Space*

It is important to note that the cubicle did not spread everywhere; Northern Europe embraced a different strand of office design focused around providing an individual office, with full walls, a window, and a door, for each employee.[27]

Chiat/Day and the New Open Office

In the early 1990s cubicle walls were broken down in favor of open plan office designs. In these modern open offices once again hundreds of workers sat at desks with limited partitions between them and fully open lines of sight.

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[23] *Workspheres*, p. 30.
[24] *Workspheres*, p. 30.
[25] Jill Andresky Fraser, *White Collar Sweatshop: The Deterioration of Work and its Rewards in Corporate America* (New York: W.W. Norton & Co., 2002), p. 35.
[26] Fraser, p. 35.
[27] Northern Europe here referring to Scandinavia, the Netherlands, and Germany. van Meel, p. 38.

This concept is well represented by the New York Chiat/Day office designed by Gaetano Pesce and Jay Chiat. Billed as 'the office of the future' the design was, and still remains, well-loved by the design world.[28] Composed of bright primary colors, the Chiat/Day space lacked designated work spaces, and was composed of communal coffee-shop like tables and artfully arranged booths.

Figure 6, Chiat/Day New York Office Interior

The Chiat/Day office supported 140 employees with no dedicated individual space except for a locker in which to store all their belongings. Each day employees would check out a laptop and phone and attempt to find a place among the brightly-colored office in which to work, before starting again from scratch the next morning.[29]

While revolutionary, the Chiat/Day design proved to be unsustainable and highly uncomfortable for the employees who used it; 'Anything that could have gone wrong went wrong. People arrived and had no idea where to go, so they left.…No work was getting done. It was a disaster.'[30]

[28] *Workspheres*, p. 14-5. Also Saval, p. 272.
[29] *Workspheres*, p. 15.
[30] Saval, p. 276.

Strata Decision Technology: Contemporary Open Office

Recognizing that perhaps the Chiat/Day office pushed office design too far into the realm of art, the open office concept was subsequently reworked and revamped with more stability, less color, and a return to designated work spaces. Since the early twenty-first century dot-com and tech giants have adopted and popularized this conceptualization of the open office.

Notable for a lack of privacy, the contemporary open office features very low partitions, if any are present at all. Workers sit at long, communal tables with a strong visual focus placed upon the technology which occupies the majority of each employee's desk. The color scheme is frequently neutral, the decorations minimal, and the furniture chosen for its functionality for working long days, rather than any particular aesthetic value.

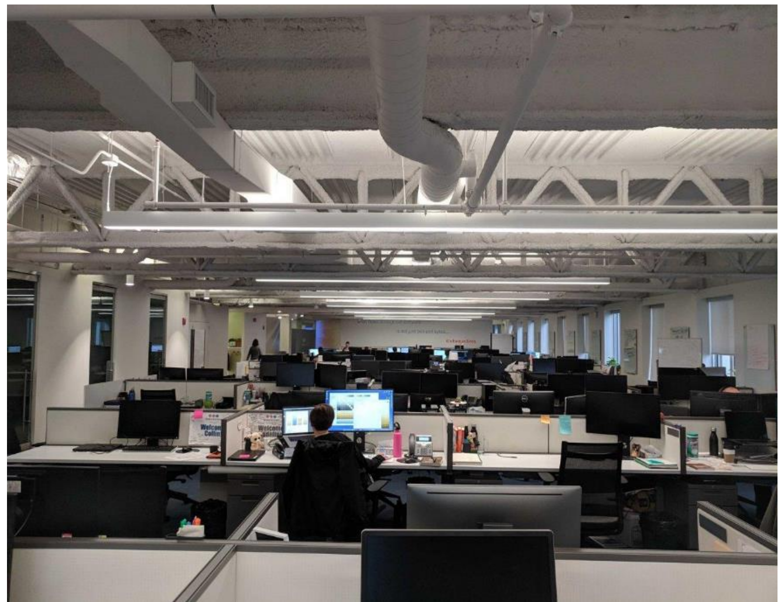

Figure 7, Strata Decision Technology Office Interior

The contemporary open office is thought by many to have been designed and implemented as a deliberate revolt against the soul-crushing nature of the cubicle and the disorganization of experiments like Chiat/Day.[31] Whether the contemporary open office has achieved these results, however, is questionable.

Three Voices, Three Histories of Office Design Change

Technology Leads the Way: Architectural Histories of the Office

The dominant narrative of office design history stems from a school referred to here as the architectural school, so-called because this group of scholars refer heavily to writing by British commercial office architect Francis 'Frank' Duffy.

[31] Andrew Ross, *No-Collar: The Humane Workplace and It's Hidden Costs* (New York: Basic Books, 2003), p. 110.

Duffy began writing on the history and design issues of office in the late 1960s and is credited with introducing Bürolandschaft to Britain. As an architectural student Duffy established 'the office' as a distinct category of building with its own functional and aesthetic requirements. In part because for a substantial period of time Duffy produced some of the *only* scholarly writings on office design, and in part because his arguments are straightforward and convincing, Duffy's works underpin the writings of many subsequent researchers and authors on the office and on related subjects.

Duffy is joined in the architectural camp by journalist and author of *The Office: A Hardworking History*, Gideon Haigh, and journalist, progressive organizer, and newly-elected Pennsylvania State Senator Nikil Saval, author of *Cubed: A Secret History of the Workplace.* This school of thought emphasizes the role which technology, and technology-related occurrences, have played in the changing nature of office design.

Duffy describes this school of thought's ideological groundwork most clearly; 'Information technology is the principal agent of change in office work and in office design.'[32]
From Duffy's vantage point all aspects of the designed office, from the building's height and depth, to the amount and distribution of light, and shape of desks, have been designed in response to new technologies. In this hierarchy of office design change factors, technology is followed in importance by office organization, building construction, and real estate factors.[33]

This technology-centered narrative of office design history begins with the invention of steel beams, credited with creating office buildings featuring large, open spaces for working.[34] The invention of the elevator, electric lighting, and basic air conditioning allowed office buildings to dramatically increase in size, and the telephone and typewriter made office 'space far busier, far more productive and also far noisier', reflecting a new necessary pack of work.[35] Subsequent improvements to air conditioning and the invention of fluorescent lights prompted the design and erection of deeper buildings with open floor plans, as access to the natural light and cooling breezes from windows was no longer necessary.[36]

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[32] Francis Duffy, *the new office* (London: Conran Octopus, 1997), p. 52.
[33] *The Changing Workplace*, p. 130-1.
[34] Delgado, p. 93. This was possible because steel beams significantly decreased the need for interior load-bearing walls.
[35] Haigh, p. 67. Also *the new office*, p. 19.
[36] Saval, p. 133.

Duffy, Haigh, and Saval's narratives converge to stress the importance of one particular piece of technology: the computer. To these authors the computer's influence begins with the Action Office, where according to Saval computer automation freed human labor to focus more on 'tasks of judgement'.[37] Such changes to the nature of work required a workplace based around 'modularity and flexibility', which was able to be 'adaptable, moveable' as tasks were changed by computing power. [38] Similarly, Duffy positions the Action Office and the popularity of modular office systems as necessary concepts in reaction to an increasing emphasis on 'communications' stemming from the 'cybernetic environment' of the office created by the introduction of computers.[39] Concurring, Haigh ties decreased paper usage in commercial offices to the rise of the computer. Such a lack of paperwork meant that different office designs were possible and preferable, since there was then no pressing need for paper storage.[40] The computer's influence over office design is not understood as having ended with the Action Office; discussing the Chiat/Day space Saval states 'Technology had made the old office obsolete; it was time to use that technology to create the office of the future.'[41] The availability of the laptop, the internet, and cell phones meant that Chiat/Day could, and should, be designed without fixed computers, and thus also without fixed workstations.

For the architectural school, technology's influence over office design also manifests in more subtle ways. Duffy, Haigh, and Saval all support the idea that increased complication in work, brought about by the information age and computing, shaped the transition from the cubicle to the open office. Foundational to such an argument is the belief that because information age work is complicated, the inputs of many employees working together are necessary to solve problems. In order to get many employees in an office together and solving problems, a space is needed which facilitates communication – a task which the walled-in space of the cubicle is ill-equipped for. Such a new, more communicative space is achieved by removing all the siding from the cubicle, thus transitioning these spaces into open offices.[42] Architectural authors do not appear to be interested in questioning the validity that such spaces *actually* produce higher-caliber work than more segmented, privacy-driven workspaces.

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[37] Saval, p. 201.
[38] Saval, p. 201.
[39] *The Changing Workplace*, p. 82.
[40] Haigh, p. 103.
[41] Saval, p. 272.
[42] *the new office*, p. 51.

The narrative put forward by Duffy, Haigh, and Saval, while focused on the importance of technology, does acknowledge other forces of change which function as secondary factors of change. The power of organized labor to influence office design is brought up, but only in relation to alternative designs in Northern Europe, and the influence of Frederick Taylor and Scientific Management is time-locked, ending its hold on office design after the initial Larkin-styled office.[43] Thus Scientific Management is credited with the removal of all storage space from a turn-of-the-century clerk's desk, but not with the breakdown of cubicle walls in the beginning of the next century.[44] Additionally, architectural school authors stop their lines of questioning after pinpointing design change on technology; they do not spend significant page space analyzing how and why technology has changed and been manifest through physical designs.

The architectural technology-focused rationale positions the office primarily as a tool to make businesses 'more efficient', and able to squeeze more work, and more profit, out of employees. Haigh states 'The objective throughout, naturally, has been to make the office as efficient as possible…'[45] Haigh conceptualizes the office as a space which is fundamentally boring, restrictive, and emotionless, and Duffy asserts that worker enjoyment of spaces cannot alone justify their design.[46] As a genre, architectural histories of the office tend not to spend time unpacking such assumptions, thus implicitly, and silently, align themselves with a capitalist understanding of what work is and should be. These assumptions in turn make it difficult for architectural authors to explore radically different possibilities as to what the office *could be*. Not exploring what the office could be means this selection of authors also cannot fully explore what the office is now, or what it used to be.

As it does not apply a critical lens to capitalistic concepts of what office spaces should be, a lens of technological influence over office design is also one which is compatible with contemporary commercial architectural practice. Situating technology as the loci of some of the office's most unpleasant designs absolves employers and businesses of blame for negative experiences of their office spaces. Free of guilt or burden for the dehumanizing effects of office design, architects and designers can be free to continue creating similar designs without any need for a paradigm shift to improve the experience of the office and the connection labor relations, the office, and design.

[43] This is highlighted many places including: Haigh, p. 272. *The Changing Workplace*, p. 141. *the new office*, p. 134.
[44] Haigh, p. 103. Also discussed in Haigh, p. 263.
[45] Haigh, p. xi.
[46] Haigh, p. 245. Also *The Changing Office*, p. 18.

Such shifting of blame away from individual companies, designers, and the capitalist system within which they work is illustrated through Duffy's comparative analysis of Northern European and North American office design traditions. In *the new office* (1997), Duffy declares that while the North American tradition of the office is undesirable, the Northern European tradition is too expensive to be feasible, and thus should not even be considered for implementation.[47] Here Duffy determines feasibility by cost, rather than employee comfort or satisfaction. Further, Duffy makes little attempt to lay out alternative frameworks and metrics in the evaluation of office spaces and feasibility; cost and efficiency (as measured by commercial clients in financial terms) are uncritically presented as the only possible evaluative tools. In framing feasibility this way, Duffy creates a narrative of the office which is tailored to work within the desires of his clients; businesses who want inexpensive, functional spaces which will support above all else the generation of additional profit. By framing evaluation of office spaces in this way, Duffy shapes a history of the office which is catered to corporate self-conceptions, and an uncritical continuation of commercial office architectural practices, such as his own.

It's Not Just In Your Head: Psychological Approaches to Office Design

Psychologists conducting scientific experiments and surveys of offices and office design comprise a second significant school of thought on office interiors. Authors and works in this group include Michael Brill and the Buffalo Organization for Social and Technological Innovation (BOSTI), Eric Sundstrom and his 1986 book *Work Places: The Psychology of the Physical Environment in Offices and Factories*, and Craig Knight and S. Alexander Haslam's 2010 study *The Relative Merits of Lean, Enriched, and Empowered Offices*. These scholars reiterate the architectural school's technology narrative while simultaneously calling some of its core principles, namely the links between a need for increased productivity, changing natures of work, and changes to office design, into question.

The rigor and scope of such studies, grounded in both the scientific method and standards of scientific proof provides groundwork for psychological works to highlight incongruities between office design literature and the design of offices as they are physically realized and experienced. Such methodology leads the psychological school to question many of the presumptions taken for granted by architectural scholars, including the key assumption by Duffy et al that crafting office design around technological changes is successful in

[47] *the new office*, p. 43.

increasing productivity. Beyond simply questioning this assumption, the results of several key studies from the psychological school suggest a lack of definitive proof in the relationship between changes to office design and increased productivity.

Despite problematizing many of the conclusions of the architectural school of office design, the psychological school still relies on the basic technology-centered timeline of office development as a starting point for their research. In his pioneering book *Work Places* Eric Sundstrom situates the development of the early open office in relation to changing architectural technologies such as the steel beam, and the increasing depth of the office in the 1950s and 60s in relation to improved lighting and air conditioning.[48] Sundstrom frequently cites Frank Duffy to lay out this basic trajectory of changing office design. Unlike Duffy, Sundstrom develops a critical relationship with such a narrative, probing the efficacy of office design changes; 'Exactly why an organization should become more productive in a completely open office was never quite made explicit. However, the implicit argument was that communication would improve and that improved communication would in turn lead to higher morale, better decisions, and greater responsiveness of the organization as a whole.'[49] Sundstrom's line of inquiry raises additional questions; if changes to office design have not increased productivity, why have they been broadly adopted? And what else might be motivating such change?

Geared toward corporations seeking to improve productivity (and profit) through office design, Michael Brill and BOSTI set out to investigate these phenomena, and presumably to outline concrete design steps which were scientifically proven efficiency-boosters. Spanning five years, the study surveyed office worker satisfaction with the design of their office space mapped against relative performance and efficiency before and after design changes to working spaces.[50] Although the BOSTI study was able to triangulate a series of suggested materials, colors and layouts for efficient, effective offices, it's primary conclusion was that such elements were not the predominant factors contributing to increased productivity. The study reiterated the assertion already suggested by Sundstrom that there was no proof fully open offices were needed for productive inter-office communication and teamwork - information age tasks were completed just as efficiently in more cellularized offices.[51] Further, BOSTI concluded that the most effective way to raise worker productivity lay not in

[48] Sundstrom, p. 55. Also discussed Sundstrom, p. 84.
[49] Sundstrom, p. 340.
[50] Michael Brill, *Using Office Design to Increase Productivity: Volume One* (Buffalo, New York: Workplace Design and Productivity, Inc., 1984), p. 9.
[51] Brill, p. 95.

specific design decisions, but in the relinquishing of some control over office design to employees.[52]

BOSTI's results were replicated twenty years later by Craig Knight and S. Alexander. Knight and Alexander's experiments tested relative productivity in offices decorated by workers, decorated by managers, undecorated, and decorated by workers then re-arranged by managers. Just as in BOSTI's study, the results were clear: employees with control over the design and visual presentation of their workspace were more productive than those without control, even when the pre-designed space was comfortable and aesthetically pleasing.[53] Such results add further weight to Sundstrom's assertions and BOSTI's findings that there is tension between corporate rationale for office design changes and the ways in which these designs actually impact the workplace. Knight and Haslam address this tension head on, stating that their results 'sit uncomfortably' with previous literature on office design and within the contemporary practices of office design.[54]

Continually highlighting the productive power of worker control of space, these psychological studies invite readers to question why, if what is proven to increase productivity is greater worker control over their space, would companies continue to implement office designs which actively *decrease* worker input? If office design changes are not truly based around increasing productivity, why then *does* the design of the office look and change as it does? Despite their results making such a clear call for further investigation, the body of psychological scholarship does not harness these questions and dive deeper into causal factors of office design changes.

Much like the scholars of the architectural school, psychological scholars investigating the office frame structure their studies around notions of productivity. The office is presented and investigated solely as a location and tool for work. While the notion that 'The physical environment gets shaped according to our ideas about work, about workplace, and about the organization' is acknowledged by BOSTI as a driving ideological tenet, the rest of the two volume study contains few mentions to organizational structure and pay, or overall worker treatment.[55] Like the architectural body of writing, psychological literature frames worker

[52] Preferences of colors used in office spaces are summarized Brill, p. 276. Final conclusions Brill, p. 302.
[53] Craig Knight and S. Alexander Haslam, 'The Relative Merits of Lean, Enriched, and Empowered Offices: An Experimental Examination of the Impact of Workspace Management Strategies on Well-being and Productivity', *Journal of Experimental Psychology: Applied*, 16.2, (2010), 158-172, p. 162.
[54] Knight and Haslam, p. 167.
[55] Brill, p. 28.

comfort and satisfaction only in relation to productivity, never as factors or goals in their own right. The psychological school's primary concerns do not lie in worker satisfaction, happiness, or comfort (although these are addressed as they factor into productivity).

Interlude: Adrian Forty - A Bridging Approach

In his seminal design history text *Objects of Desire*, Adrian Forty devotes one chapter to the evolution of office design, and in particular, changes to the office desk. Forty's approach to the subject stands apart from other office history methodologies in that he begins to address head-on many of the structural and object-oriented aspects of office design history which neither psychologists nor architects explore in depth. Forty's analysis serves as a middle ground between the more clinical writings of the architectural and psychological schools, and the emotional and highly political explorations of the office by labor scholars.

Forty argues that in addition to technology, forces of political economy and social power have exerted, and continue to exert, force over changing designs within the office. He situates design in general, and design of the office in particular, as a canvas upon which other ideas, ideas about 'the nature of work and about the behavior expected of people doing it' are displayed and negotiated.[56] Within such a complex framework of simultaneous impact factors, technology no longer occupies a position of overriding impact upon office design, particularly as technology itself is shaped by larger societal influences.

In addressing additional social forces Forty's history and analysis must grapple with the sister concepts of productivity and efficiency. For Forty efficiency is '... much less than the science it claimed to be, and not so much concerned with overall office efficiency as with changing the character of clerical work.'[57] Here Forty complicates, questions, and expands the concept of efficiency, allowing for the understanding that efficiency has the potential to be a cover for other sociological factors. Instead of understanding efficiency only as a mechanism to generate profit, efficiency is problematized by Forty, broadened to also encompass elements of managerial control over work and workers. This represents a significant departure from the approaches taken by either the architectural or psychological scholars.

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[56] Adrian Forty, *Objects of Desire: Design and Society 1750-1980*, 3rd edn (London: Thames and Hudson, 1989), p. 120.
[57] Forty, p. 130.

Forty argues that ‘The development of the office desk and of other office furniture and equipment needs to be seen against this background of the deteriorating status of the clerk and the pressure from management to increase efficiency.’[58] Such work problematizes the evolution of office furniture and design, situating physical changes within larger sociological changes taking place. This expansion of context allows Forty to complicate design changes in the office, tying them not just to concepts of efficiency as determined by employers, but also factors exterior to the workplace itself regarding the relationships and status of employers and employees and a greater understanding of the meaning and value of labor. Instead of office design changes exclusively being used to increase productivity, they should also be seen as ways in which employers redefine the position and status of the employee. Thus for Forty the design of the office becomes a front line in the fight to define labor, as well as to control it.

Forty applies this framework to various periods in office history, arguing that the cubicle gained in popularity just as white-collar work was once again becoming a valued and highly paid profession in the early 1970s. Instead of the technologically driven historical understanding that computers created a need for the more cellularized office designs like the cubicle, Forty’s suggests that office space underwent changes in order to reflect the slightly more ‘high-status’ nature of newer white-collar professionals such as ‘computer programmers and analysts’, who were entering the office with college degrees and expectations of higher salaries.[59] While by no means an elite setup, the cubicle offered slightly more privacy than designs predating it, yet less privacy than the fully enclosed spaces for bosses and executive management. This in-between nature of the design of the office, the quasi-privacy of the cubicle, mirrored the in-between nature of new office labor relations and the social status of new professionals in the office.

Through his application of an expanded understanding of potential factors in changes of office design to several historical moments, Forty adds a layer of complexity to the architectural and psychological conceptualizations of office design history. Unlike the architectural or psychological schools, Forty begins to complicate the motivations behind the changing design of offices, assigning responsibility for the changes previously framed as having evolved naturally. Additionally, Forty’s exploration of labor relations in the office and in society at large beings probe the influence of capitalism over workplace design, gingerly

[58] Forty, p. 124.
[59] Forty, p. 150.

exploring the idea of the office as a site of labor, and a site where power relations are actively consented not just through social concepts, but also through design.

Forty's exploration of the influence of capitalist notions of control over labor and fundamental relationships between workers and capitalist is by no means complete. In contrast to his critique of the decline in privacy afforded to clerks in the 1910s, Forty paints a rosy picture of the office in the 1960s, describing these spaces as being equipped with lighting and heating better than workers would have in their own homes.[60] The comfort of post war offices is explained by Forty as being a function of the difficulty post World War II companies had in attracting good clerical workers; it was easier (and cheaper) for businesses to increase the respectability of office work (through measures such as modernizing and beautifying the office) than to increase employee salaries.[61] While this analysis may be accurate, it does not incorporate the same sort of critical eye Forty applies so successfully to other examples of office design changes. While Forty is willing to critically analyze labor relations and the deeper meaning which design changes in the workplace had for office workers in Edwardian offices, this same criticality is missing in his discussion of the postwar office. In short, Forty's analysis of these spaces seems to have stopped at their pleasing aesthetic appearance and conformation to notions of 'good design', leaving insights into potentially negative experiences in these spaces by the wayside. Because Forty isn't looking for these trends in the more modern office, he doesn't see them - they are hidden by surface level improvements to the space.

In beginning to explore the waters of labor theory in relation to some design changes, but not consistently applying these theories, Forty raises important questions about the relationships between office design and political economy. What are the relative costs of paying employees more versus re-designing the office? Does the redesign of the office have long term economic benefits in terms of productivity? Could these factors also play a part in why the office began to modernize after World War II, *and modernize in the way it did?* Here Adrian Forty does not have answers.

It's Capitalism: Labor Scholars Weigh In

Similar questions regarding the experience of workplaces are reiterated and explored by social and labor historians in their explorations of the changing nature of labor and work.

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[60] Forty, p. 143.
[61] Forty, p. 147.

This school of scholars infrequently address the *design* of offices head on; rather, labor historians interrogate the history of the office as a social space, and in the process sometimes touch upon design. Such methodologies lead Marxist and Marxist-adjacent scholars Harry Braverman, Barbara Garson, and Andrew Ross to a simple explanation for why the design of the office has changed in the ways in which it has: capitalism. The labor studies school of office analysis argues that the office and all its facets, including design, are shaped by labor relations, in particular the need for Capital to control labor.

Garson, Braverman, and Ross explore the same notions of technology which the architectural school accepts at face value, the psychologists problematize with their studies, and which Forty begins to probe. But unlike the other scholars, labor authors assert without question that at a fundamental level technology is shaped and directed by capitalism. The framework this school uses is built around an interest in and understanding of Marx and labor theory, which is then applied to information and white-collar economies. Playwright and journalist Barbara Garson summarizes the approach to technology that this group takes most succinctly, stating 'The humiliating and debilitating way we work is a product not of our technology but of our economic system.'[62] For labor scholars all elements of the office, both physical and experiential, must tie back into the economic base of capitalism.

In opposition to the architectural and psychological schools of thought which downplay Frederick Taylor's influence over the modern office, labor scholars, Braverman in particular, make it clear that 'It is impossible to overestimate the importance of the scientific management movement in the shaping of the modern corporation…'[63] For Braverman, the importance of Taylorism revolves around the continued way in which Taylor's emphasis on control of employees is still reflected in office work, office structures, and office design. The element of control can be observed from the first office buildings, with their rows of desks in clear supervisory lines of sight, all the way through to the present, where employees are forced to sit together in order to optimize their work outputs.

To labor scholars Taylor's concept of Scientific Management is crucial to an understanding of the white-collar workplace because it accidentally exposes truths about capitalism and the exploitation of labor inherent in every workplace. For Braverman in his seminal text *Labor*

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[62] Barbara Garson, *All The Livelong Day: The Meaning and Demeaning of Routine Work*, 5th edn (Middlesex: Penguin, 1977), p. 211-2.
[63] Braverman, p. 86. As Braverman so infrequently addresses design as a standalone concept, the many overarching statements made in *Labor and Monopoly Capital* about the office should be seen as applying to all facets of the space, design included.

and Monopoly Capital, Taylor's preoccupation with absolute control over labor, over the people working in a factory or in an office, embodies the desire of capital and capitalism to control labor in its totality. However, following the Marxist tradition, this total control of labor will never be possible - labor is too ensconced in what it means to be human to be separated from anyone.[64] The structural and fundamental impossibility of total control of labor, however, does not stop Capital and capitalists from trying to capture more and more of this vital resource. Concluding her book *All the Livelong Day* (1975), Garson highlights this same fundamental need to control workers; 'When you're using someone else for your own purposes, whether it's to build your fortune, or to build your tomb, you must control him. Under all exploitation systems, a strict control from the outside replaces the energy from within as a way of keeping people working.'[65]

Technology, then, instead of being an end itself, its own discrete entity, is the means to which capitalism achieves greater productivity, profits, and control over labor. From a Marxist viewpoint new technologies enter the world and workplace 'not as the servant of "humanity", but as the instrument of those to whom the accumulation of capital gives the ownership of those machines.'[66] Because new technologies stem from a capitalistic system, they enter the office as a force providing businesses (not employees or designers) 'with an arsenal of new, and continually improving tools with which to supervise their employees' activity and output.'[67] Within such a framework the technology which the architectural school identifies as having molded the office is actually *itself* being shaped by forces of capitalism.[68]

Because labor scholars and authors do not frequently include analysis of design and physical objects, it is helpful to apply their framework of labor and control in the office to designed spaces in order to compare it to other schools of thought. For example, an investigation by labor scholars of the introduction of the computer to the office might start by comparing the Larkin Administration building, lacking in modern technologies, and the Strata Decision Technology office, driven by the computer. Despite the lack of technology in the former, and overabundance of it in the later, these two office designs share strikingly similar appearances and functions. Technology then, cannot be said to be the primary influence shaping these designs. To find out a more true root cause, a Marxist methodology would then turn toward an exploration of labor-based factors such as the comparative cultures of

[64] Braverman, p. 51.
[65] *All the Livelong Day*, p. 211.
[66] Braverman, p. 193.
[67] Fraser, p. 87.
[68] Braverman, p. 20.

control in both the Larkin and Strata offices, or explorations of the relationships between labor-saving technology and labor-controlling practices and designs.[69] Analysis of the office rooted in Marxist theory and methodology is unique among the three branches of office history in the significant way in which analyzes the office within society and in relation to societal forces. This adds much-needed contextualization to the preceding schools of thought, which tend to look primarily within the office to understand it.

Figure 8, Side-by-side Comparison of Larkin Administration and Strata Decision Technology Office Interiors

Perhaps most importantly, social and labor theorists contribute a dimension of analysis of office spaces and office design which otherwise appears to be relegated to the sidelines - humanity. In their analyses labor authors explicitly acknowledge, and systematically explore, how the office both as a designed space and as a social environment affects people, the lives they live, and the way they see and relate to the world. In her journalistic approach Garson explores this topic with particular poignancy:

> As it happens, there are no columns in standard double-entry bookkeeping to keep track of satisfaction and demoralization. There is no credit entry for feelings of self-worth and confidence, no debit column for feelings of uselessness and worthlessness. There are no monthly, quarterly or even annual statements of pride and no closing statement of bankruptcy when the worker finally comes to feel that after all he couldn't do anything else, and doesn't deserve anything better.[70]

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[69] Barbara Garson, *The Electronic Sweatshop: How Computers are Transforming the Office of the Future into the Factory of the Past* (London: Simon and Schuster, 1988), p. 89. Also discussed in *The Electronic Sweatshop*, p. 125.
[70] *All the Livelong Day*, p. 19.

Garson continually returns to the concept that offices are spaces in which humans work, interact, and live their lives. Although for some they might be thought of and designed as spaces for pure productivity, Garson asserts that offices and factories must still be considered as functionally spaces for humans, who interact with office design on a human, emotional level.[71] Garson isn't alone in this analysis - it is this focus on the human needs of the office which also leads Braverman to identify the importance of human control over the workspace over a decade ahead of any psychological study.

The added value of the labor school of thought continues beyond the human; social and labor scholars tie the way a business conceives of its workers with the way offices are physically designed. Labor works on the office suggest that a business which sees employees as having human value will design offices which give each workers a sufficient amount of light, space, and air, but a business which sees employees as cogs in the machine will treat them as such, with a smaller, less private, more basic space. Sociologist Andrew Ross encapsulates this relationship between business structure and office design in his analysis of early dotcom success story Razorfish. Ross highlights that in the company's initial years all employees, including the CEO and founder, shared the same open plan space. As the company became more successful, the office began to be physically divided, with the CEO sitting in his own glass walled office. At its peak of success, the CEO did his work in a plush and fully enclosed office located in a corporate building several blocks away from production-level employees.[72] Ross' Razorfish case study highlights how office design changes according to relative values placed upon employees, employers, and profit.

Despite their additions to office literature, labor historians exploring the office infrequently, if ever, address the physical realities of the spaces in they are observing. When physical office design is discussed this school of authors, designed objects and spaces are analyzed not as entities in and of themselves, but instead as embodiments or representations of more abstract concepts. Braverman's discussion of the changing shape of the office desk under the application of Scientific Management is a fitting example of this phenomenon. In discussing office desks being stripped of all 'cubbyholes' and places to store files, Braverman immediately pivots his analysis, concluding 'we may understand this was an effect of close and frightening supervision'.[73] This sole attention to labor factors means that

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[71] *All the Livelong Day*, p. 87.
[72] Andrew Ross, *No-Collar: The Humane Workplace and It's Hidden Costs* (New York: Basic Books, 2003), p. 114-5.
[73] Braverman, p. 309.

any other effects of the design such as the notion that this change makes the desk more like a table found in the home, are unexplored.

An Incomplete Picture - Missing Voices on Office Design

Despite the ubiquity of the office and its crucial role in the economy, office design is still a surprisingly underexplored and under analyzed topic given its expansive presence in daily life. In fact, one of the few points that all authors on office design share is that the topic isn't written on nearly enough. [74]

In the management field writ large, despite lengthy writing on 'how to lead, how to make one-minute decisions, how to manage difficult people, how to reorganize...Not many... describe WHERE all of this takes place…'[75] The physical space of the office is often completely ignored by management literature, and where it is discussed, is done so only by addressing *types* of office designs, rather than interrogating the merits and functionalities of specific designs themselves. In one of the rare explorations of office design written for office managers, *Understanding Offices: What Every Manager Needs to Know*, Joanna Eley and Alexi F. Marmot highlight this gap in management literature, especially given the importance of the physical office space which, after salaries, make up businesses' second largest expense. [76]

The lack of management literature on office spaces may be due to a problem of optics. In order to give office design advice in line with the results of psychological experiments, consultants would have to recommend worker control of office design. This would put consultants at odds with their clients, businesses, and thus would not be desirable. The alternative however, would be equally undesirable, as highlighting practices in public-facing literature which explicitly discusses what businesses do now, and why they do it can come across as inhuman and harsh. Eley and Marmon enter this arena of advice when they discuss executive furniture choices, and openly say that regular workers, 'the lowliest clerk' do not deserve money spent on them for furniture, because they are not 'worth' it.[77] There is

[74] This is commented upon by many authors including the following: *On the Job*, p. 133. Brill, p. 23. Becker and Steele, p. 3.
[75] Joanna Eley and Alexi F. Marmot, *Understanding Offices: What Every Manager Needs to Know About Office Buildings* (London: Penguin, 1995), p. 28.
[76] Eley and Marmot, p. ix.
[77] Eley and Marmot, p. 108.

a reason such declarations are frequently hidden; openly discussing lack of human value and worth regarding employees cannot be not good for company morale.

Conclusion: What's next for the (history of the) office?

Between the architectural, psychological, and social historical approaches to the office, many factors have been explored. However, with each school of authors basing their analyses on their discipline's particular strengths and interests, a significant gap has developed vis-a-vis explorations of office design; physicality and broad conceptual ideas are rarely both explored in the same texts. Few authors, with the exception of Adrian Forty, writing on the subject have explored the designed objects of the office as objects in and of themselves. Similarly, with the exception of labor scholars, little focus has been applied to ways in which the office is experienced, and its relationship to capitalism. As the office exists *both* as a place of implemented design *and* as a site where labor is carried out, a comprehensive analysis of office space requires investigation of both fields. As of right now, this scholarship remains incredibly scant.

A Marxist Design Historical approach to the office would be uniquely situated to successfully explore both components of the office. Such an approach would be armed with the theoretical toolset and reading list to approach the office as a physical, designed object, put to a practical purpose. At the same time, such a methodology would also be equipped to place physical items in context with labor relations and capitalist machinations. A Marxist Design Historical approach would be equipped to tackle questions of how the material reality of offices impacts the working experience of the user, the way workers relate to their co-workers, to the companies they work for, and to wider economic concepts.

Armed with a more comprehensive understanding why it is the way it is, perhaps interior designers working on new office spaces stand a chance of countering Barbara Garson's declaration regarding work, the office, and the specter of control that 'It could be different (but it probably won't be)'[78]

Basic human compassion must lead us to agree with Garson that '**We want the computer but not the electronic sweatshop**.'[79] We want an office that has privacy but that also allows us to commune with our peers. We want an office with modern design, but not

[78] *The Electronic Sweatshop*, p. 261.
[79] *The Electronic Sweatshop*, p. 263.

corporate sterility. We want to work with technology, but don't want to be consumed and ruled by it. 'We want the computer but not the electronic sweatshop.'[80] A comprehensive understanding of the ways in which the office has come to be the way it is today must allow us to design just that.

[80] *The Electronic Sweatshop*, p. 263.

Bibliography

Primary

Books

Leffingwell, William Henry, *Scientific Office Management: A report on the results of applications of the Taylor system of scientific management to offices, supplemented with a discussion of how to obtain the most important of these results* (London: A.W. Shaw Company, 1917).

Propst, Robert, *The Office: A Facility Based on Change* ([n.p.]: Herman Miller, 1968).

Taylor, Frederick Winslow, *The Properties of Scientific Management* (London: Harper and Brothers, 1914).

Articles

Lohr, Steve, 'Cubicles Are Winning War Against Closed Offices', *The New York Times*, 11 August 1997.

Tierney, John, 'From Cubicles, Cry for Quiet Places', *The New York Times*, 19 May 2012.

Schlosser, Julie, ‘Cubicles: The great mistake’*,* *CNN Money* (22 March 2006) <https://money.cnn.com/2006/03/09/magazines/fortune/cubicle_howiwork_fortune/index.htm > [Accessed 26 April, 2019].

Shanahan, Andrew, ‘The office cubicle: from commercial flop to best-selling design classic’, *dezeen*, (February 1, 2015) <https://www.dezeen.com/2015/02/01/office-cubicle-50th-birthday-herman-miller-robert-propst/> [Accessed 26 April, 2019].

Winston, Anna, ‘Open-plan office designs unpopular with workers and can damage productivity’, *dezeen*, (21 November 2014) <https://www.dezeen.com/2014/11/21/open-plan-office-designs-unpopular-with-workers-damage-productivity/> [Accessed 26 April, 2019].

Secondary

Books

Becker, Franklin and, Fritz Steele, *Workplace by Design: Mapping the High-Performance Workscape* (San Francisco: Jossey-Bass, 1995).

Berry, John R., *Herman Miller: Classic Furniture and System Designs for the Working Environment* (London: Thames and Hudson, 2005).

Braverman, Harry, *Labor and Monopoly Capital: The Degradation of Work in the Twentieth Century* (London: Monthly Review Press, 1974).

Brill, Michael, *Using Office Design to Increase Productivity: Volume One* (Buffalo, New York: Workplace Design and Productivity, Inc., 1984).

Brill, Michael, *Using Office Design to Increase Productivity: Volume Two* (Buffalo, New York: Workplace Design and Productivity, Inc., 1985).

Browne, E. John, *The Open Plan Office: Principles and Design* (London: The Institute of Office Management, 1970).

Business Equipment Manufacturers, *New Concepts in Office Design* (Elmhurst, Illinois: The Business Press, 1968).

Delgado, Alan, *The Enormous File: A Social History of the Office* (London: John Murray, 1979).

Doyle, Judith and Max Nathan, *The State of the Office: The Politics and Geography of Working Space* (London: The Industrial Society, 2002).

Duffy, Francis, *The Changing Workplace*, ed. by Patrick Hannay (London: Phadion, 1992).

Duffy, Francis, *the new office* (London: Conran Octopus, 1997).

Eley, Joanna and Alexi F. Marmot, *Understanding Offices: What Every Manager Needs to Know About Office Buildings* (London: Penguin, 1995).

Forty, Adrian, *Objects of Desire: Design and Society 1750-1980*, 3rd edn (London: Thames and Hudson, 1989).

Fraser, Jill Andresky, *White Collar Sweatshop: The Deterioration of Work and its Rewards in Corporate America* (New York: W.W. Norton & Co., 2002).

Garson, Barbara, *All The Livelong Day: The Meaning and Demeaning of Routine Work*, 5th edn (Middlesex: Penguin, 1977).

Garson, Barbara, *The Electronic Sweatshop: How Computers are Transforming the Office of the Future into the Factory of the Past* (London: Simon and Schuster, 1988).

Haigh, Gideon, *The Office: A Hardworking History* (Melbourne: Miegunyah Press, 2012).

Handy, Charles, *The Age of Unreason*, 2nd edn (Cambridge, Massachusetts: Harvard Business School Press, 1990).

Head, Simon, *The New Ruthless Economy: Work and Power in the Digital Age* (Oxford: Oxford University Press, 2003).

Hedge, Alan and Sheena Wilson, *The Office Environment Survey: A Study of Building Sickness* (London: Building Use Studies Ltd, 1987).

Hook, Sidney, *Towards an Understanding of Karl Marx: A Revolutionary Interpretation* (London: Camelot Press, 1933)

Huws, Ursula, *Labor in the Global Digital Economy: The Cybertariat Comes of Age* (New York: Monthly Review Press, 2014).

Jackall, Robert, *Workers in a Labyrinth: Jobs and Survival in a Bank Bureaucracy* (Montclair, New Jersey: Allanheld, Osmun & Co., 1978).

Kanigel, Robert, *The One Best Way: Frederick Winslow Taylor and the Enigma of Efficiency*, 2nd edn (London: Abacus, 2002).

Kleeman, Jr., Walter B, *Interior Design of the Electronic Office: The Comfort and Productivity Payoff* (New York: Van Nostrand Reinhold, 1991).

Mills, C. Wright, *White Collar: The American Middle Classes* (New York: Oxford University Press, 1951).

Myerson, Jeremy and Imogen Privett, *Life of Work: What Office Design Can Learn from the World Around Us* (London: Black Dog Publishing, 2015).

Nadworny, Milton J., *Scientific Management and the Unions: 1900-1932 - A Historical Analysis* (Cambridge, Massachusetts: Harvard University Press, 1955).

On the Job: Design and the American Office, ed. by Donald Albrecht and Chrysanthane B. Broikos (New York: Princeton Architectural Press, 2000).

Quinan, Jack, *Frank Lloyd Wright's Larkin Building: Myth and Fact* (London: The MIT Press, 1987).

Ross, Andrew, *No-Collar: The Humane Workplace and It's Hidden Costs* (New York: Basic Books, 2003).

Saval, Nikil, *Cubed: A Secret History of the Workplace* (London: Doubleday, 2014).

Sundstrom, Eric and Mary Graehl Sundstrom, *Work Places: The Psychology of the Physical Environment in Offices and Factories* (Cambridge: Cambridge University Press, 1986).

Time and Motion: Redefining Working Life, ed. by Emily Gee and Jeremy Myerson (Liverpool: Liverpool University Press, 2013).

Turner, Gavin, and Myserson, Jeremy, *New Workplace, New Culture: Office Design as a Catalyst for Change* (Aldershot, Hampshire: Gower Publishing, 1998).

van Meel, Juriaan, *The European Office: Office Design and National Context* (Rotterdam: 010 Publishers, 2000).

Vischer, Jacqueline C., *Space Meets Status: Designing Workplace Performance* (New York: Routledge, 2005).

Waring, Stephen P, *Taylorism Transformed: Scientific Management Theory Since 1945* (Chapel Hill: University of North Carolina Press, 1991).

Workspheres: Design and Contemporary Work Styles, ed. by Paola Antonelli (New York: Museum of Modern Art, 2001).

Zuboff, Soshana, *In the Age of the Smart Machine: The Future of Work and Power* (New York: Basic Books, 1988).

Articles

Knight, Craig and S. Alexander Haslam, 'The Relative Merits of Lean, Enriched, and Empowered Offices: An Experimental Examination of the Impact of Workspace Management Strategies on Well-being and Productivity', *Journal of Experimental Psychology: Applied*, 16.2, (2010), 158-172.

Cohen, Linda M., 'Bridging two streams of office design research: a comparison of design/behavior and management journal articles from 1980-2001', *Journal of Architectural and Planning Research*, 24.4, (2007), 289-307.

Durfee, Don, 'Take My Desk - Please', *CFO*, 22.11, (2006), 99-102.

Piepers, Bart and Erik Veldhoen, 'Out of the cell and on to the Vital office: The Demise of the Office', *International Lighting Review*, 981, 14-15.

Other

Baldry, Chris, ‘Hard Day at the Office: The Social Construction of Workspace’ (Unpublished paper, Department of Human Resource Management, University of Strathclyde Occasional Paper Number 9).