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De-scripting office design: exploring design intentions in use

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Abstract

Purpose: This paper aims to explore how users respond to office design through their use of space. Intentions for how office spaces should be used can be understood as sociomaterial scripts that are inscribed into the architecture by designers but also communicated through organisational change processes. The paper elaborates on how users de-script office spaces, that is, how they respond to these scripts through use.

Design/methodology/approach: The paper draws on a case study of an office design intervention in a public organisation. Taking a sociomaterial approach, the paper employs the concepts of scripting and de-scripting to analyse the data.

Findings: The findings show that users subscribe to, repair, resist or re-script design scripts. This suggests that users can enact agency in use through creative acts of appropriation. Further, both materiality and user participation play equivocal roles in user responses.

Originality: The originality of this study lies in linking aspects of the design process with user responses and in taking a sociomaterial approach to examine design and use.

Research limitations/implications: The paper is based on a single case study where the design process was studied retrospectively. The case is regarded as typical of contemporary office design processes, but more studies that follow projects from design into use are needed.

Practical implications: This suggests that design solutions should be better adapted to the work practices instead of applying generic concepts to specific situations and that design and use should be understood as overlapping processes.

Keywords: workplace design, office use, sociomateriality

Introduction

In workplace change processes, office design is regarded as a means to achieve organisational aims. Workplace change management leverages spatial change by aligning space, management, technology, culture and work processes in integrated workplace concepts (IWCs) (Skogland, 2017, Chilton and Baldry, 1997, De Paoli *et al.*, 2013). This suggests that the potential strategic value of office design for organisations relies on the appropriate alignment between aspects through successful implementation of IWCs (De Paoli *et al.*, 2013), which further demands that the office design is used according to the design intentions embedded in the use concepts of the IWCs. However, office design research has shown that users often do not change their workplace behaviours in the way intended by IWCs (van Meel, 2015, Brunia *et al.*, 2016, Hoendervanger *et al.*, 2016).

While many different factors are hypothesised to play a role, "misuse" of architecture has been suggested as one reason why workplace concepts do not "work "as intended (Appel-Meulenbroek *et al.*, 2011). For instance, research has shown that users do not switch places as often as intended in activity-based environments (Hoendervanger *et al.*, 2016).(Appel-Meulenbroek *et al.*, 2011, Hoendervanger *et al.*, 2016). Investigating use qualitatively, Babapour Chafi *et al.* (2018) suggest that users appropriate office concepts in different ways ranging from adoption to experimentation to rejection. Studies on differences in user satisfaction with flexible offices suggest that factors relating to the implementation process and spatial quality of the specific space may impact how users adapt to "new" offices (Brunia *et al.*, 2016). However, there has been little empirical research on how office design processes influence use from a design perspective, and relatively few studies on office concepts have

investigated office use observationally (Gjerland *et al.*, 2019). This points to a lack of knowledge about how users adapt to office concepts in practice.

To complement this gap in the office design literature, this paper investigates how users respond to office design through use. Based on a case study of a design intervention in a large public organisation, the paper explores user responses to architectural design as both process and materiality. Drawing on literature from architectural theory and organisational studies, the analysis adopts a sociomaterial perspective and uses the concepts of scripting and de-scripting (Akrich, 1992, Yaneva, 2009) to unpack how users respond to office design interventions. Although management, design and organisational change processes are entangled in the implementation of IWCs, this paper focuses on the relationship between office architecture and user behaviour. The following section presents the paper's theoretical approach to this relationship.

Understanding relationships between the design and use of office spaces

Office design research tends to take a workplace management approach to the relationship between design and use (Becker and Steele, 1995, Schriefer, 2005, Horgen *et al.*, 1999). This perspective sees the physical, social and technological parts of an organisation as an ecological system that can be correctly aligned to create dynamic harmony (Becker, 2007). The complexity and entanglement between material and social processes that are inherent in workplace design and management suggest that sociomaterial theories, which understand the social and material as co-produced, may be helpful in workplace research. From a workplace management perspective, it has been argued that IWCs are already sociomaterial constructs (Ekstrand and Hansen, 2016). However, organisational scholars have criticised the office

design approach for being mechanistic and failing to consider issues such as power and embodiment (Taylor and Spicer, 2007). This paper aims to contribute to a sociomaterial approach in workplace research by drawing on literature from design and organisational studies.

In recent years organisational research drawing on constructivist theories of the social production of space has investigated relationships between space, materiality, power and identity in office spaces (Beyes and Steyaert, 2012, Baldry, 1997). Organisational space studies often focus on the control exerted by office design on users, even when office spaces appear to be open and flexible (Dale and Burrell, 2008). As such, sociomaterial perspectives provide an approach to office design that pays attention to how concerns like power and identity play into office design. However, these studies have also been criticised for reifying space as a representation of power relations, overlooking the open-endedness of living processes where users can resist control (Beyes and Steyaert, 2012, Taylor and Spicer, 2007). This criticism is paralleled by similar concerns in architectural theory, where Yaneva's (2009) actor-network theory of design has drawn attention to what architecture does. Pointing out that objects and materials afford, facilitate, oblige or forbid actions, Yaneva (2009) builds on an actor-network theory (ANT) perspective on design to argue that architecture can be a social actor. When the agency of materiality is considered, both design and use are rendered as contingent and unpredictable processes (Våland and Georg, 2014, Latour and Yaneva, 2008). On this view, designers can make spaces that are intended to guide behaviour in a certain way, but users can choose to do something else or the materiality may not perform as expected. In this way, ANT accounts of design afford both users and materiality agency.

ANT accounts further suggest that design and use can be understood as a process of scripting and de-scripting (Yaneva, 2009). Adopted from science and technology studies (Fallan,

2008), these concepts suggest that the designer inscribes their vision of the future into the design object, which the user then interprets through use. The imagined scenario serves as a script for how the object should be used (Akrich, 1992). This suggests that designers' beliefs about relationships between the object and its context are embedded in this script. However, users can still define their relationship to the object differently than the designer envisioned by resisting use altogether, repurposing the object or changing it (Jarzabkowski and Pinch, 2013). Scripting and de-scripting can be understood as a form of asynchronous communication between designers, users and materialities. For office design, these concepts can serve to highlight user agency. The notion that designers inscribe their vision into the design also underscores the role that designers' understanding of the organisational context plays in the design of IWCs.

Studies of organisational space can provide other perspectives on organisational context than those found in the office design research (Taylor and Spicer, 2007). For example, in a study of a library building intended to produce more active, creative and self-regulating individuals, Hancock and Spicer (2011) found that users resisted the imposed identity through small acts of "misuse" such as sleeping in work areas or using the power outlets for personal uses such as for hair straighteners or razors. The authors suggest that these acts should be seen in the context of diverse user strategies where users "actively seek to reconstruct spaces" (Taylor and Spicer, 2007) to resist having managerially constructed identities imposed on them. Other studies show how users employ complex tactics to resist managerial strategies when faced with office concepts intended to induce community, fun or creativity (Dale and Burrell, 2010, Baldry and Hallier, 2010, Thanem *et al.*, 2011). From this perspective, then, "misuse" can be understood as users enacting their chosen identities.

Case study methodology and methods

Research setting

The paper draws on a case study of an office design intervention in a pension and loans provider, PenPro (a pseudonym), a large public organisation with approximately 450 employees organised in eight divisions. The study employed a case study methodology (Stake, 2005), and several characteristics of the office design project suggested that it could be seen as a common case (Yin, 2014) of office design. First, the concurrent architectural and organisational design processes connected with the organisation's relocation to a new office building employed methods commonly used in similar projects. Second, the strategic aims guiding the intervention were largely in line with strategic aims found in the office design literature (Becker and Steele, 1995, Meel *et al.*, 2010). PenPro had been housed at two different locations, so integrating the organisation was a central concern of the intervention, as were more general aims about modernising the organisation. Last, the workplace concept developed by the designers was also typical of contemporary office design in terms of intending to contribute to increased interaction and flexibility, central concerns of flexible or activity-based offices (Van Der Voordt, 2004, Skogland, 2017). The workplace concept consequently encompassed strategic design intentions found in IWCs (Skogland, 2017).

The architectural design combined elements of traditional open-plan offices and flexible offices. A remarkably open and deep floorplan characterised the office space. PenPro's two floors measuring approximately 4000 m^2 each did not contain any subdivisions except for the meeting rooms and multirooms clustered around the building's three internal cores containing support spaces. Assigned seating, commonly associated with traditional open-plan office types (Danielsson and Bodin, 2009), had been retained in the workplace concept. However, users were simultaneously provided with other places to work, such as attractive centralised

social spaces, plentiful multirooms and meeting rooms, and drop-down places associated with more flexible office concepts or the combi office (Been and Beijer, 2014).

Data collection

In line with case study methods (Stake, 2005), multiple types of data were collected for triangulation, including interviews, observations, photo documentation, documents, architectural drawings, and a mapping of changes made to the office space after relocation. The collected documents included strategic documents, reports and internal communication from the relocation process. Most of the data were collected during two non-consecutive weeks of fieldwork at PenPro, which took place approximately one year after the relocation. Nineteen interviews lasting from 45 to 90 minutes with 47 users were conducted during the fieldwork. Additionally, three architects were interviewed at their workplace in interviews lasting approximately one hour. All the interviews were recorded digitally and then transcribed, some professionally and some by the author.

Researchers have noted that it can be difficult for users to talk about architecture (Uolamo and Ropo, 2015), so different modes of interviewing were employed to elicit responses to the processes of design and use in different ways: semi-structured interviews (Kvale *et al.*, 2015), focus groups (Wilkinson, 2004), photo-elicitation interviews (Harper, 2002) and walk-throughs (Hansen *et al.*, 2010). The semi-structured interviews aimed to gain information about the design and implementation process. The building architect, two interior architects and five members of PenPro's internal relocation project were interviewed in this way. Focus groups were used to provide data that reflected collective themes in user responses to the architecture. Six focus groups were conducted with 28 users that a PenPro representative had

selected. Informants were recruited across departments and organisational levels, as well as age and gender. Four photo-elicitation interviews and two walkthroughs were conducted to connect user responses with specific spaces. The walkthroughs were conducted with groups of four to five users, each walkthrough covering one of the two floors occupied by PenPro.

The interview guides were developed to understand links between the design and change processes and use through questions about the informants' experience and perceptions. The semi-structured interview guides prompted informants to provide a narrative of the project from their perspective, beginning with open-ended questions about their role in the project and the background for the project. Other questions invited reflection about different aspects of the design and implementation process, such as "What were the organisation's aims?" and "How was the user participation process?" For the focus groups, the interview guides aimed to draw out users' everyday experience of space. Questions were aimed at linking space and organisational practices, e.g. "How does the building support your work?". Users' perceptions of links to the design and implementation processes were elicited through questions such as "How did you experience moving into a new building?".

The questions in the walkthrough and photo-elicitation interview guides were more concerned with the immediate use situation. The walkthroughs were planned based on themes and spaces that had been referenced in the focus groups. For each of the five stops, users were asked about their experience of each space, how it was used and their perceptions of the intended use. These questions contributed to a more detailed understanding of the actual use and experience of the architecture. The photo-elicitation interviews provided a more in-depth perspective on individual users' responses from different perspectives. Users with different roles in the organisation were asked to provide images of three spaces they appreciated and three spaces they did not appreciate and asked to reflect around these spaces through open-

ended questions such as "Can you talk about what you have photographed?" "What do you like about it?" What do you dislike?" As in the other interview guides, the photo-elicitation interviews concluded with general questions to invite reflection, such as "How do you view the architecture of the building in general?" and "How do you think architecture influences the organisation?". In this way, all interviews provided insight into informants' perceptions of the relationship between architecture and organisations.

Data analysis

The data analysis combined methodological and theoretical perspectives in a framework that emerged through an iterative analytical process. The coding process was based on the constant comparative analysis method (CCM) (Glaser, 1965). This methodology involves focusing on action and processes, coding data as it is being collected, constantly comparing the analytical codes given to data with each other, and building grounded theory from the data (Charmaz, 2014). However, CCM can also be used when the aim is not theory-building, such as in case studies (Postholm, 2010). In this study, CCM was used to stay close to the action in the data (Charmaz, 2014) since processes of design and use were at the centre of the analysis.

In the first part of the process, the interview data, field notes, and documents were coded using NVivo 12 software. The visual data was used as a reference during coding. This part of the process followed Charmaz' (2014) suggestions about initial coding and focused coding as steps in the coding process. Initial coding consisted of a close reading of the data, coding incident-by-incident and using gerunds to keep attention to the action in the data. This step was followed by focused coding, where the initial codes were compared with each other. The most relevant codes were then used to sort larger parts of the data. Memo-writing and

diagramming (Charmaz, 2014) were used to guide the analysis. Finally, the focused codes were analysed into higher-level categories (Corbin and Strauss, 2008) that described the interrelated processes of the office design intervention. The categories that emerged were design intentions, organisational aims, management, architecture, change process, use and organisational effects. At this point, preliminary findings were written up and presented to a focus group consisting of members of the internal project group and end-user representatives. The feedback suggested a fit between coding and the data as users could recognize themselves in the findings (Corbin and Strauss, 2008), but links between categories were still theoretically unclear. Consequently, different theoretical explanations for the data were tested, as suggested by CCM (Glaser, 1965, Charmaz, 2014). The concepts of scripting (Yaneva, 2009) and its counteraction de-scription (Akrich, 1992) were found to provide a framework that could better account for links between design and use processes than theoretical perspectives informed by either a focus on spatial configuration or power relationships (Taylor and Spicer, 2007).

The second phase of the analysis used these theoretical concepts to re-examine the data across categories. Following suggestions about "plugging theory into data" (Jackson and Mazzei, 2012), the theoretical concepts prompted an analytical question about how scripts and de-scriptions are produced in office design interventions, which then guided a re-coding of the data. In this re-coding, the focused and initial codes were re-examined using scripting and de-scripting as concepts to question the data. From this perspective, design intentions and change process emerged as central categories of scripting. Drawing on initial codes, interaction, flexibility, efficiency, and modernisation were identified as lower-order concepts within the category of design intentions. Reconsidering the data in the category of use through the lens of de-scripting allowed new categories to emerge. Drawing on terminology from the literature

on scripting (Akrich and Latour, 1992, Jarzabkowski and Pinch, 2013), these new concepts were coded as subscribing, repairing, resisting, and re-inscripting. The categories and concepts that emerged from re-coding the data guide the presentation of findings in the following section.

Office use as a response to design intentions

Scripting: collaboratively inscribing design intentions into architecture

Interviews suggested that the design process had been a collaborative process where users in the relocation project group collaborated closely with the interior architects and contributed to the scripting. The relocation project manager describes the process like this:

> "Our aim really stayed the same. We made some tweaks and developed it a bit further, but the essence of it was that we wanted a flexible space, it needed to be flexible, and there was an idea of interaction and learning across the organisation, and then it also had to operate efficiently, it had to be cost-effective."

Design intentions

Several important aspects of the design intentions are also introduced in the quote above, increasing interaction, flexibility and efficiency. While managers explicitly articulated these three aspects of the design intentions, the data also suggested that modernising the organisation was a central aim, although this change was alluded to more implicitly. The table below shows the material and social aspects of the IWC that were intended to contribute to change.

Table 1. Scripting

	SCRIPT			
	Modernisation	**Interaction**	**Flexibility**	**Efficiency**
Architecture	Open-plan layout Design aesthetic Transparency Clean look Building aesthetics	Open plan layout Depth of layout Excess capacity of meeting rooms Zoning Social zones Multirooms	Multirooms "Informal" zones for work Social zones Standardisation	Zoning Standardisation of furniture
Use policies	Clean desk policy	Rules about talking Rules about use of multirooms	Rules about use of multirooms Clean desk policy	Clean desk policy Rules about eating
Organisational processes	Management training OD project Organised user participation process	Teamwork Organised user participation		Work tasks
IT technology	Laptop computers	Mobile phones and computer headsets Laptop computers	Wireless internet Laptop computers	Online booking system Double screens

Change process

The quote also points to how users in the relocation project group collaborated closely with the interior architects and contributed to the scripting. In this way, the vision behind the script (Akrich, 1992) could be described as heterogeneous, where organisational aims, architectural intentions and end-user concerns were negotiated between designers and users throughout the design process (see table 2). By emphasising how the aims stayed the same, the quote further illustrates how the project group management aimed to maintain control over the change process.

Table 2. Visions in architectural scripting

		'HETEROGENEOUS VISION'	
Aspect	**Organisational aims**	**Architectural intentions**	**End user concerns**
Modernisation	Culture change Professionalisation Less "public" identity Attractivity	"Clean aesthetic" encourages more formal and disciplined behaviour from employees	Lack of organisational identity Messiness in old building
Interaction	Increased interaction and integration across departments Increased organisational learning	Face to face communication and Chance encounters	Noise Privacy Need for meeting rooms
Flexibility	Facilitate organisational restructuring	Mobile, "informal" working makes users more flexible Every worker gets the same amenities	Possibility to change space Different professions, different needs
Efficiency	More efficient workflow Increase productivity Cost-efficient facility management	Minimize noise and distraction	More efficient workflows

The architects also exerted control over the design process by giving ordinary users limited possibilities to influence the design. In interviews, the architects pointed out that external facilitators had carried out an organised user participation process involving all users. However, the lead interior architect's dictum of "inform widely, involve narrowly", a phrase that project members also repeated in interviews, supports the notion that user inputs into the design process were tightly managed. A sense that the user participation process had been a pseudo-process was a theme that came up in the focus groups and walkthroughs. Users pointed out that a non-binding vote had been allowed to cast regarding the design of the workstations felt like a pseudo-process, some saying they would rather not have been asked at

all if their vote carried no weight. This could suggest that the techniques of participation employed by the architects and process designers engendered a sense of disempowerment.

De-scripting: responding to design intentions through use

Subscribing

Nonetheless, both interviews and observations showed that users predominantly used the space in the way that architects and managers intended. This suggests that, to a large extent, users tended to *subscribe* (Akrich and Latour, 1992) to much of the scripting. In nearly all interviews, users expressed appreciation for the parts of the design that facilitated interaction. As Table 1 shows, the open-plan layout was only one of the architectural features intended to increase interaction. In addition to the copresence and visibility afforded by the open layout, an excess capacity of meeting rooms was intended to encourage interaction.

The openness of space emerged as a central user concern in the data. As one user pointed out in a focus group interview:

> "One thing that's been positive is that I feel I've gotten to know my co-workers better, and as you say, it's much easier to know who's here. When somebody calls, I know if there's somebody I can go and ask or not, or who's around who looks available. That's a big benefit."

This quote shows how users appreciated both the increased sociability afforded by proximity to co-workers and the benefits to work practices of easier information-sharing and access to co-workers. It also draws attention to how openness allows an overview of where co-workers are located. This indicates that users valued the architectural support for interaction when they felt that the spatial arrangements directly benefited their work practices.

Another theme that emerged from the interview data was how the visibility of open space could give users a new perspective on the organisation. In different focus group interviews, users described similar experiences of how they appreciated being able to put a face to names they had previously only encountered in email exchanges or how the physical proximity made it easier to reach out in person. Becoming familiar with new faces and seeing how many people were employed there gave them a new sense of belonging to a bigger whole. At the same time, the minor differences in design between different departments made the differences between groups and professions within the organisation apparent while simultaneously bringing together the different parts into a coherent whole for users. Users described this new sense of common identity as enriching their work experience. This shows how the openness of space played a role in changing users' perceptions of themselves in the organisation, much in line with the modernisation script.

Some data suggested that aesthetic experience could play a role in users' willingness to use space as intended. One example of this was compliance with the clean desk policy. In nearly all interviews, users brought up how much they appreciated what was often described as a clean, fresh or neat atmosphere. As one user in a focus group put it: "But I remember before we moved, and because of that, I'm pleased that we have clean desk." The reference to the conditions in the old offices, often described in interviews as messy and cluttered, was common in interviews, and the comparison was often used to emphasise satisfaction with the office space. In relation to the clean desk policy, the experience of a clean aesthetic seems to add to users' willingness to adopt new behaviours. This seems to support the designers' notion that aesthetics could contribute to behavioural change. However, aesthetic experiences never emerged as the only reason users gave for adopting or resisting any behaviours, as the cleanliness was mandated by the explicit rules of the concept, which interviews suggested had

been strictly enforced by managers. This suggests that aesthetic experience may have contributed to some users' subscription to the script, but perhaps not to the extent presumed by the designers.

Repairing

Complaints about noise and distraction in the open office were common themes in interviews, and both user accounts and observations showed that practices of headphone use had emerged to mitigate these conditions. This could be viewed as an act of *repairing* the script (Jarzabkowski and Pinch, 2013), where users are positive about the script's content but find that materiality is counteracting the intended use. One example of a specific complaint about noise that came up in focus groups, semi-structured interviews and the walk-throughs concerned noise from social zones. Many users were particularly annoyed by the sound of people socialising in the central social zones, which spread into the work areas. Contrary to the architects' claim that the building's layout would absorb noise, users suggested that noise amplified by the concrete walls of the building. Even though managers also believed that noise from these areas could be excessive, making physical changes was not an option. For some users, this problem caused much frustration and contributed to negative perceptions of the office space functionality, as suggested in this quote from a focus group interview where users discussed the centralised layout:

> "We don't work in teams, so sitting in an open landscape doesn't really have any positive effects in terms of work. And then there's the noise factor that, on the other hand, makes you less productive, and I dare say the quality of work goes down too because you're not as concentrated on your tasks as you were when you had a cell office."

This user does not cite the experience of being distracted by noise as the only reason why the office space does not support her work practices, but she views noise as an important factor in reducing her productivity. By linking her experience of noise to the open-plan layout, she expresses the commonly held view among users that the open-plan layout generally causes more noise than cell offices. However, while a large proportion of users agreed that cell offices provided better support for concentrated work, the view that users preferred an open-plan layout due to the increased support for communication it provided was also supported by the data. Nonetheless, the data suggested that the open office space was understood as unfavourable for concentrated work, as illustrated in the quote.

In interviews, it was further suggested that headphones were used to repair privacy issues instead of following the suggestions about mobility embedded in the flexibility script to move into a multiroom for concentrated work. Even users who appreciated the open-plan layout claimed that it was more difficult to concentrate in the open office space because of distractions from co-workers seeking information or communication. The focus groups interviews suggested that in most departments, informal practices had emerged around the use of earphones, where putting on earphones signalled unavailability. The following exchange from a focus group illustrates this practice:

> 1: But I think it's a bit like, we've talked about it, that there's some respect for… if you've put your headphones on, it's because you need… this peace.
>
> 2: Yes, it's harder to ask then, is what I've noticed at least.
>
> 1: Then one just has to wait for five minutes unless there's a big rush… you usually just sit like that for a maximum of an hour on end anyhow.

Here, the first user points out that the headphone-wearer can expect respect for his or her privacy, while the second user concurs that headphone-wearers are not as easily disturbed. In response, user 1 offers some exceptions to the implicit rule that allow some space for negotiation. Since the two users come from different divisions, this suggests that a shared understanding of headphone use has emerged across the organisation. This shows how using headphones could allow users to regulate interaction and their exposure to sound, in a sense mimicking the privacy previously afforded by cell offices. Responding to these problematic issues by using headphones to *repair* the design allowed users to retain their positive evaluations of the space.

Resisting

While users who *repaired* scripts *subscribed* to the ideas but had trouble fitting the script to their practices, a different set of responses showed users more concerned with intentionally *resisting* the scripting. For example, the interviews with architects and internal project members suggested that architects had attempted to encourage flexible working practices with high-backed sofas, bar-height tables and drop-down tables. In focus group interviews, users typically expressed a lack of comprehension of how these informal furnishings could benefit their work practices. One common objection was that using the bar-height tables interpreted as intended for meetings would disturb people working concentratedly at their desks. Users who said two screens made their work easier questioned the benefit of moving to a different desk or sofa to work on a small pc screen.

Consequently, observations showed that much of this furniture had been moved away by users by the time of the study, often stowed away in corners or pushed around to perform other functions, such as storage or screening. As such, the resisting against flexible furniture also included elements of repairing. Although users also claimed to be interested in increasing

their flexibility, their views of what constituted flexibility within their work practices differed from the forms of flexibility intended in the script. Therefore, users responded to the perceived lack of insight into their work practices by not using space as intended by the architects.

Accounts of more direct examples of resistance came up in all interviews, and observations confirmed practices such as leaving a mess on one's desk or eating in the workspace. As one user put it in a focus group interview, "I understand the whole clean desk principle if you practice it, but as long as you don't I just think it's pointless and strange [...] you just have to do it because someone somewhere has made a decision, then it's mostly just irritating." This illustrates users' concerns about understanding the intentions of the design, which was a common theme in interviews. As the example above illustrates, users struggled to make sense of the idea of flexibility insofar as they still had assigned seating, and intentions of flexibility were thus often resisted. Focus groups also suggested that resistance to the clean desk policy seemed to have been encouraged by uneven enforcement of rules by managers. In contrast to the repairing response, resisting scripts implies that users are opposed to the ideas inscribed in the design and their managerial enforcement. While both repairing and resisting imply "misuse" of the office space, only resisting suggests direct opposition to managerial or designerly intentions.

Re-scripting

A final theme of *re-scripting* office space came up in observation and walkthroughs, where changes made to office architecture could be observed. These changes implied sidestepping the intended use altogether by repurposing or appropriating space. Examples of re-scripting

could be observed in the way users had moved furniture around to serve other purposes, such as blocking noise, or the way managers had decided to designate some multirooms as shared "offices" by re-furnishing them as complete workstations.

One example which came up in a walkthrough involved a conscious appropriation of space by IT developers. In both focus group interviews and the architects' and project members' accounts of the design process, it emerged that the provision of whiteboards had been a point of contention between designers and IT developers during the design phase. Although the developers had successfully negotiated more whiteboards into the design, they were still unsatisfied with the availability. By rearranging some of the multirooms in their department, however, IT developers had made space for practices related to collaboration and problem-solving that required different materialities than those provided in the design. One multiroom had been covered with wrapping paper to create a kind of disposable whiteboard. A grid had been taped on a multiroom glass wall with electrical tape to chart project progress in a different room. A third room had also been papered with wrapping paper and had furniture removed. Here post-its represented a complex process that developers needed to figure out, explaining the name "thinking space" according to a developer. By appropriating space in this way, users adjusted the design to fit their work practices. The re-inscripting resulted in practices that designers had not predicted, while at the same time, the material affordances allowed users to develop their work practices in conceivably innovative ways.

The table below summarises the central features of the subscribing, repairing, resisting and re-inscripting practices. The implications of this analysis will be discussed in the next section.

	Subscribing	**Repairing**	**Resisting**	**Re-inscripting**
Perceptions	Appreciating spatial affordances Benefit for work practices Sense of common identity	Appreciating spatial affordances Negative views of functionality	Disagreeing with policies Lack of meaning	Work practices not supported Needs overlooked by architects
Experiences	Well-being Positive aesthetic experiences	Discomfort	Management control	Sense of spatial agency
Actions	Using space as intended Learning	Modifying use with technology to accomplish work	Non-use Breaking rules	Appropriating space for different work practices

Table 3. De-scripting

Discussion

The findings suggest that applying a sociomaterial perspective can have several implications for understanding how users respond to office design through use. First, the findings show that user responses can be tied to the way users are drawn into the design process. In the study, managers were drawn into a participatory process where they contributed to the script, while the rest only contributed through intermediaries. This highlights how managing and designing are entangled in office design. For example, although the architects learned about the IT developers' work practices from the user participation process, the developers were only partially successful in getting designers to understand the specificity of their material needs in negotiations with the designers. The designers' "scenario" (Akrich, 1992) for use did

not fully acknowledge the IT workers' practices, and the organised user participation process did not seem to create a link between work practices and architectural design, in contrast to how user participation in design has been shown to allow users to influence organisational change processes (Våland and Georg, 2014). In the end, designers still retained control over the physical architecture. This suggests that even though designers draw managers into scripting, making the process more collaborative than the scripting of technical objects originally described by Akrich (1992), other users are not invited to participate in a way that they find fair.

The findings suggest that antagonistic de-scriptions were co-produced among professional groups and workgroups who collectively resisted the office design. These responses seem to have emerged from group interactions rather than the individual experiences primarily investigated in office design studies (Gjerland *et al.*, 2019). For example, legal staff complained about noise in open space that threatened their concentrated work, and developers' complaints about having too few whiteboards to work on led them to re-script multiroom spaces. The emergence of responses related to specific professional work practices indicates how workplace materiality can be entangled with users' needs for maintaining their professional identities. This could suggest that users' professional identities are threatened when work practices are not supported by office design, as organisational studies have suggested (Baldry and Barnes, 2012, Hancock and Spicer, 2011). Taking professional identities into consideration could offer an additional layer of explanation to negative user responses to IWCs beyond those already considered in the office design literature (Brunia *et al.*, 2016, Been and Beijer, 2014).

However, the findings also show that users responded to the design by negotiating group practices that led to more positive experiences and identities. For example, practices that

emerged within workgroups, such as repairing noise and privacy with headphones, served as much appreciated support for the valued work practices. Although primarily related to individual users' willingness to adopt new practices depending on their agreement with the values and ideas in the script, subscribing was also found to be contingent on an appreciation of a collective experience when users valued the experience of how the open office design seemed to make the organisation more open and accessible. The potential for interaction across organisational divisions suggested by this experience contributed to a sense of common identity, albeit an identity that appears more provisional and emergent than the managerially defined identities forced upon users according to organisational accounts (Dale and Burrell, 2010, Baldry and Hallier, 2010, Thanem *et al.*, 2011). This supports the office design notion that the increased potential for interaction in the open layouts associated with IWCs contributes to user satisfaction (Brunia *et al.*, 2016, Been and Beijer, 2014, Van Der Voordt, 2004), but the findings also point to a more complex understanding of how interaction is produced in office space.

The lens of de-scripting also draws attention to user agency in the relationship between materiality, aesthetics and identity in use. IT developers linked specific materialities to their professional identities and work practices, but they were faced with giving up work tools to ensure standardisation of the workplace concept and a uniform aesthetic. From their perspective, the concept did not benefit their work practices, which they did not feel had been considered in the design. When IT workers re-scripted their space, they gave the spaces new use but also subverted the clean aesthetic. Spaces were appropriated by adding a new layer of "messy" materiality, thereby changing ownership and creating new meaning. This points to how users can resist scripts through creative and productive use of space, as also suggested by (Dale and Burrell, 2015). This further suggests that not all unintended use should be construed

as misuse, as Babapour Chafi *et al.* (2018) have also pointed out. Instead, this conceptualisation of use shows how office design is negotiated during use and how users change spaces to make them more conducive to their work practices. This suggests that users participate in design outside of organised user participation processes by repairing design failures and adapting the office space to their work practices. From a design perspective, this raises questions about when the design process ends and how designers should participate in this ongoing process.

Conclusions and implications

By using the concepts of scripting and de-scripting to examine user responses, this study shows how user resistance and compliance co-exist in use. In general, these findings indicate that the links between design and use are more contested, unstable and unpredictable than assumed in the office design perspective. For office design research, the findings further suggest that an understanding of office design that highlights the links between the aspects of IWCs that are generally held apart conceptually (Robertson, 2000) can be helpful to understand how office design facilitate change in organisations. Instead of viewing office space as a system that can be normatively manipulated to achieve strategic ends (De Paoli *et al.*, 2013, Skogland, 2017), office design could be understood as a more open and emergent process that can mobilise user agency to create productive and innovative spaces (Yaneva, 2009).

For practice, this suggests that the specificity of work practices should play a more central role in developing office designs, and design solutions should be better adapted to the work practices instead of applying generic concepts to specific situations. Further, the findings

suggest that full compliance with an office concept should not necessarily be the goal. Instead, the design phase should overlap with use so that adjustments can be made dynamically. For workplace change management, this suggests that post-implementation practices need reconsideration.

Although the typical characteristics of the case studied here may imply that the generalisations that have been drawn from the case study could apply to other sites where IWCs were implemented (Stake, 2005, Yin, 2014), more research is needed to understand relationships between design and use of IWCs. Furthermore, the theoretical approach used in this study is novel within the field of office design research, and more studies in this vein are needed to expand and question this perspective's usefulness for the field. This study focused on the design perspective and left out management and organisational change perspectives, which could be considered a theoretical limitation. In further research, observational studies taking both design and management perspectives that follow office design interventions from the design process into use would be helpful.

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