



Unlearning and consent in the UK Fire and Rescue Service

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Abstract

Why does so much literature on unlearning ignore the people who do the unlearning? What would we understand differently if we focused on those people? Much of the existing literature argues that unlearning can only be achieved, and new knowledge acquired, if old knowledge is discarded: the clean slate approach. This might be a reasonable way of organising stock in a warehouse, where room needs to be created for new deliveries, but it is not an accurate description of a human system. This article draws on a detailed qualitative study of learning in the UK Fire and Rescue Service to challenge the clean slate approach and demonstrate that, not only did firefighters retain their old knowledge, they used it as a benchmark to assess new routines and practices. This meant that firefighters' trust in, and consent to, innovation was key to successful implementation. In order to understand the social aspects of unlearning, this research focuses on the people involved as active agents, rather than passive recipients or discarders of knowledge.

Keywords

agency, consent, forgetting, knowledge, knowledge management, learning, organisational memory, trust, unlearning

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Introduction

The creation, capture and transfer of knowledge has long been a focus of the knowledge management literature. As Huber (1991: 88) notes, the literature on acquiring knowledge is 'voluminous and multi-faceted'. Conversely, unlearning, the ways firms unlearn old knowledge, routines and practices, has received much less attention. Hedberg's (1981) 'How organisations learn and unlearn' is strongly weighted towards learning at the expense of unlearning, and there has been a relative paucity of empirical studies addressing unlearning (De Holan and Phillips, 2011; Easterby-Smith et al., 2004; Thompson, 2007; Tsang and Zara, 2008). Conceptually unlearning has been somewhat a Procrustean bed. Existing theories have been reshaped and stretched to align with orthodox assumptions about the unlearning process (Klein, 1989). Most also ignore the inconvenient fact that it is the people, who work in organisations, to whom the task of learning or unlearning falls.

The dominant perspective in the literature on unlearning is the clean slate approach (Hedberg, 1981; Huber, 1991; Nystrom and Starbuck, 1984) in which old knowledge is deliberately discarded and replaced with new knowledge. As a process, this is conceptualised as being intentional, linear and a necessary antecedent to the acquisition of new knowledge (Hedberg, 1981). This is a useful way of describing a supply chain, or a retail outlet, or a distribution system where space needs to be created in warehouses, shops and lorries before new stock can be introduced; but it has much less resonance in a human system where brains are rarely cleaned out in the anticipation of fresh ideas. For the people who work in organisations, unlearning is not necessarily a linear or sequential process, nor does it always result in the discarding of old knowledge (Howells and Scholderer, 2016; Klein, 1989; Tsang, 2008).

This article focuses on the people who do the unlearning and argues that unlearning itself is a dialectical and iterative process, to which consent is central. It draws on detailed qualitative research into the Fire and Rescue Service. The firefighters in our study were not passive recipients of instructions and updates from on high, but active agents, questioning and testing innovations. It contributes to the literature in three ways: (i) by challenging the idea of unlearning as a clean slate in which old knowledge is discarded. Klein (1989) and Howells and Scholderer (2016) have critiqued this theoretically (though see also Tsang, 2017). Here, we provide evidence of unlearning in practice. The firefighters in this study did not forget old or obsolete knowledge; rather, old knowledge was retained as a source of interest and humour, or as a means of challenging and adapting new practices; (ii) by establishing the importance of consent. Trust in, and consent to, innovations influenced how and whether they were adopted; and (iii) by focusing on and theorising the people, rather than the organisations, involved in learning and unlearning. These three contributions are inter-related. Acknowledging that unlearning does not involve discarding old knowledge sharpens our observations of firefighters retaining an awareness of old practices. Firefighters who remembered the old practices and routines were able to use them as benchmarks against which innovations could be approved, challenged or amended. Such challenges meant that implementation often required consent. This realisation, that knowledge was retained, not only integrates people into the way both learning and unlearning are understood, it also puts them at the centre of the process.

Focusing on the people involved has the potential to illuminate an important organisational issue: the requirement to forget knowledge that is no longer of any use and retain knowledge that is effective and productive. This is particularly germane to front-line firefighters who are now fighting fewer fires. Since 2008, there has been a 23% reduction in the number of incidents attended by firefighters (an incident is defined as either a fire, false alarm or non-fire related event) and a 37% reduction in the number of actual fires attended (Home Office, 2019). As a result, the UK Fire and Rescue Service has witnessed a pivotal shift in how it delivers its services because firefighters now spend significantly less time fighting fire and more time preventing it. Firefighters gain less direct experience of tackling fires both in terms of their frequency and severity. Running parallel to this, technological developments have changed firefighters' everyday working praxis and the equipment they use. This means that the knowledge and skills learned away from the fire ground are vital, while at the same time firefighters need to be able to discard obsolete knowledge. Existing studies of UK firefighters have not addressed how they unlearn, how they remember and how these processes interact (Cohen-Hatton and Honey, 2015; Cohen-Hatton et al., 2015; Okali et al., 2014, 2016).

This article starts by reviewing the literature relating to organisational memory, remembering and forgetting. It draws out the distinctions between forgetting (as inadvertent) and unlearning (as planned) and introduces the idea of trust in work. It goes on to set out the research methods used to examine practice in Northern Fire, a pseudonym for a major Fire and Rescue Service. In the findings, it describes the importance of storytelling to preserve memories, distinguishes between forgetting, which, in this example, was an organisational failing with an individual solution, and unlearning, when new routines and practices were introduced. It also focuses on the importance of trust and consent. By centering the experiences of the firefighters, this article provides an empirical account of the realities of unlearning, challenges existing theory and suggests some important lessons for practice.

Unlearning and forgetting

Forgetting

The unlearning literature refers to both forgetting and unlearning. Though often used interchangeably, these are, in fact, distinct processes and it is helpful to distinguish between them. Forgetting is generally inadvertent. An unplanned omission that may be 'accidental or unwanted', arising from a 'degradation of the stocks of organisational knowledge' (Fernandez and Sune, 2009: 621). In some circumstances, forgetting may be beneficial to organisations. Technological developments or new working practices may make old ways of working obsolete, so forgetting avoids becoming ensnared in outdated praxis. In other cases, forgetting core skills or being unable to repeat past successes may be damaging (De Holan and Phillips, 2011; Dierickx and Cool, 1989; Fernandez and Sune, 2009; Hislop et al., 2014). Forgetting may arise from a failure to capture new knowledge, which may be lost before it can be successfully embedded (De Holan and Phillips, 2004). It may occur in circumstances where innovations or knowledge have decayed over time. Organisations might fail to repeat a once successful process or

innovation (De Holan and Phillips, 2004; Rao et al., 2003). Finally, the organisation itself may have changed, to the point that the old knowledge is no longer relevant or required (Foroughi and Al-Amoudi, 2020). So, forgetting is inadvertent and accidental; an unplanned process. When obsolete routines and practices are forgotten, such an omission is advantageous; but, with forgetting, there is no guarantee that what is lost will be obsolete.

This literature has an ambiguous relationship with workers. From an ontological perspective, forgetting has often been seen as attributable to personnel turnover or loss of human capital (Carly, 1992; Massingham, 2008). The challenges that arise when knowledge walks out the door as important personnel leave organisations are well documented (Carly, 1992; Huber, 1991; Kogut and Zander, 1992). Though even here workers are presented as passive, as people who have forgotten or never learned. De Holan and Phillips's (2011) typology of unlearning and forgetting is theoretically illuminating and clearly distinguishes between inadvertent and planned processes; but empirically it relies on a small number of interviews, with senior management asserting what workers do and do not know based on rather limited evidence. In all of these accounts, the absence of experienced workers is clearly important, but their presence is much less well theorised and much less well researched.

Unlearning

Unlearning, by contrast, is deliberate; a planned and premeditated process through which old knowledge is replaced by new. The dominant perspective with regards to unlearning is the idea that knowledge is purposefully and intentionally removed from organisational memory. Intentionality is the key to unlearning (Hedberg, 1981). From an epistemic perspective, this is deemed to occur as an antecedent to new learning and is seen as a manageable process (Hedberg, 1981; Hislop et al., 2014; Nystrom and Starbuck, 1984). Hedberg (1981: 18) states that unlearning is intentional and a 'process through which learners discard knowledge'. Following this reasoning, organisations that unlearn too slowly exhibit 'a crucial weakness' as knowledge grows but 'becomes obsolete as reality changes' (Hedberg, 1981: 3). Similarly, Nystrom and Starbuck (1984: 53) note how organisations can become 'complacent and learn too little' and that in order to survive 'organisations must unlearn'. So, unlearning is presented as a necessary precursor to, and precondition of, learning; before new ideas can take root organisations must 'unlearn old ones by discovering their inadequacies and discarding them' (Nystrom and Starbuck, 1984: 53). Huber shares the view that unlearning occurs before learning and the acquisition of new knowledge. He notes that unlearning 'opens the way' for new learning to occur in the first place and highlights the damaging effects of organisational memory loss 'especially with respect to the retention of tacit knowledge' (Huber, 1991: 105).

Such an approach has a clear appeal for scholars of organisation. Old, redundant knowledge is discarded, new, valuable knowledge is acquired and the whole process is planned and overseen by management. However, this view of unlearning is reductive and simplistic. There are few empirical studies of unlearning and those that do exist suggest that the process is neither as simple, nor as linear, as discarding the old and welcoming in the new. Baumard and Starbuck's (2005) study of telecommunications companies

maintains that companies *should* learn from their failures while simultaneously observing that they do not. The ‘learning that should follow failure’ either does not occur or ‘teaches the wrong lessons’ (p. 295). Their conclusion is that ‘unlearning successes may be a prerequisite for learning from failure’ (p. 296). It may be, but this does not tell us why it is not happening.

We argue that this limitation is a direct result of the unlearning literature’s failure to adequately theorise and observe the people doing the unlearning. The idea that knowledge, routines and practices can be discarded is central to much of the unlearning literature, but it is not a realistic appreciation of the way that individuals change their routines. As Howells and Scholderer (2016) observe, unlearning is not a recognised technical term in psychology and their review of the literature failed to uncover any accounts of successful attempts to deliberately remove memory. This does not mean that the whole idea of unlearning is redundant. Both individuals and organisations clearly acquire new knowledge and replace outdated practices and routines with new ones. It does, however, suggest that we urgently need to examine what happens and how it happens.

Klein (1989) offers a more accurate perspective of unlearning that challenges the positions discussed above. He suggests that organisations and individuals do not necessarily unlearn existing routines, behaviours or knowledge before acquiring new knowledge. Equally, unlearning as a process is distinct from learning and the two should be viewed separately. The ontological premise that unlearning involves the deliberate discarding of knowledge is also critiqued. At the heart of Klein’s analysis of unlearning is the idea that unlearning is parenthetical. Unlearning may be seen as placing old routines or knowledge in parenthesis with new knowledge. Accordingly, by theorising unlearning as a parenthetical process ‘obsolete behaviours can be addressed as well-chosen, adaptive sets of responses, but to conditions that no longer obtain’ (Klein, 1989: 300). This idea of theorising unlearning as a parenthetical process where the old knowledge co-exists with the new is much more convincing theoretically (Howells and Scholderer, 2016; Klein, 1989).

Trust and consent

This focus on the people who unlearn (Brook et al., 2016; Tsang and Zahra, 2008) shifts researchers’ attention to the ways in which innovations are introduced. Since old knowledge is not discarded, new practices and routines need to be *negotiated* with workers’ consent. This is a much more complex process in which workers are active agents, choosing to put new routines into practice, rather than simple repositories of new knowledge. So, Brook et al.’s (2016) study of social workers confirmed that knowledge was not permanently lost, it was simply used (or not used) in different ways; Tsang’s (2008) study of joint ventures in China reveals workers judging new routines against old ones and critically appraising the experience and expertise of venture partners before agreeing to changes; while Kamoche and Maguire’s (2010) account of tunnellers in the Yorkshire coal mines shows the ways that managers and workers each justified different types of knowledge and sought to gain or retain control of the work process.

To trust in new knowledge, routines or practices workers must be able to have confidence in, and rely on, these innovations; to believe in their truth, accuracy or efficacy

(OED, 2002). In all of the examples above, the trust (or lack of trust) that workers had in the new practices being introduced, in their management and in their organisational partnerships, played key roles in learning and unlearning. Trust is an important feature of organisational life (Colquitt, 2011; Mayer et al., 1985; Rousseau et al., 1998; Weick, 2008; Williams, 2001), but one that may be unevenly distributed (Fox, 1974). For this article, the interesting question is not how a low trust environment operates (see, for example, Dietz, 2004; Harvey and Turnbull, 2020), such a context is clearly dysfunctional and an arena in which any innovation would struggle; but how, in a standard working environment, workers chose what to trust and the reasons for their choices. Work is, after all, a social process in which routines, practices and effort are implicitly and explicitly negotiated. Pratt and colleagues (2018) show the personal aspect of trust in their study of American firefighters in which experience and integrity were prized; here, we consider another aspect, the nature of the innovations themselves. Crucially, it was trust in the innovations that informed, guided and shaped consent. As Kamoche and Maguire (2010) observe, workers' consent was an important factor in unlearning and could cause issues if withheld. Here, trusted techniques gained consent and approval far more readily than those that were not trusted.

Research context and methods

At Northern Fire, a single case study approach was adopted to understand how organisational memory was both preserved and lost. The fieldwork used a combination of participant observation, focus groups and semi-structured interviews. Phase one, conducted by the first author, commenced in November 2015 and concluded in May 2016. Phase two, conducted by the first and third authors, was shorter and ran from August to October 2019.

Comprehensive, in-depth data was acquired by observing firefighters, senior management and emergency response staff during their normal working day. In phase one, day-long visits were made to 12 fire stations ranging from city centre to remote rural locations. Every visit included a focus group, individual interviews with each participant and observations of training, routines and workplace socialising. The focus groups lasted between one and two hours (excluding interruptions for call outs), involved between three and five participants, and explored the ways tacit knowledge was retained, transferred and lost. They covered a total of 44 firefighters, including 10 station managers and four group managers (the rank above station manager). In addition, 14 semi-structured interviews were conducted with senior management and key staff within emergency response and support functions. The top management team, comprising the Assistant Chief Fire Officer, Deputy Chief Fire Officer, Chief Fire Officer and Director of HR were all interviewed, together with managers in key departments and support functions, including the Fire Protection Department, the Emergency Response Team, procurement, IT and administrative support.

In phase one, the first author used immersive ethnographic methods to explore and understand the lived experiences of participants. Red Watch at one of the stations were observed from February to May 2016, observations that covered live training sessions on new breathing apparatus as well as more routine training exercises. Their breathing

apparatus training was observed as they undertook a number of practice exercises, which included simulated rescues of dummies trapped in cars, chemical spillages and entering burning buildings. The first author also participated in a 'live burn', a training ground real fire practice exercise.

Further observations involved shadowing the incoming Deputy Chief Fire Officer during the initial handover period. All handover and operational meetings were recorded, detailed field notes were taken and the Deputy Chief Fire Officer kept a handover diary to record key events and milestones as he took up his new post. During this period, Northern Fire dealt with extensive and extreme flooding as well as the largest mill fire in its operational history. These unprecedented events helped shape and inform the senior management team's critical reflection on unlearning.

Phase two was significantly shorter and was conducted by the first and third authors at two of the urban stations involved in phase one. It comprised four interviews, three focus groups of probationer firefighters with their mentors and observations of a tutorial on the new breathing apparatus practice. Only the four probationer firefighters were new to the study, their three mentors had already participated in phase one, increasing the total number of informants from 58 to 62 (48 firefighters and 14 management and support staff). This phase was designed to follow up the findings from phase one.

Ethnographic observations were set out in detailed field notes, which were subsequently uploaded to NVivo (version 11) and analysed. All interviews were recorded and fully transcribed. Triangulation between various data sources was further secured through a detailed review of Northern Fire's formal training materials and operational guidance. This comprised electronic and hard copy training as well as operational manuals that included hazardous chemicals, casualty care and line rescue techniques. Unique access was given to individual firefighters' training and development records held on electronic maintenance of competence files (EMOCs). The EMOCs for all 44 front-line firefighters in phase one were also reviewed as part of the data analysis process.

The analysis, performed primarily by the first author, in consultation with the second and third authors, adopted Saldana's (2016) approach to coding, using a first and second cycle basis to capture the summative and salient parts of interview transcripts and ethnographic field notes. The first cycle of coding sought to establish common patterns that arose (Bernard and Ryan, 2010; Grbich, 2013). For example, the first cycle of coding ascribed codes such as 'remembering' and 'forgetting' to interview responses to questions on unlearning. These codes were then placed under the wider category of data relating to 'organisational memory loss'. Saldana (2016: 15) notes the danger in coding for themes and argues that this approach is misleading; a 'theme can be an outcome of coding' but should not be something that is itself coded. For example, 'tacit knowledge' was a code adopted in the research, which became part of the 'organisational memory loss' category and 'consenting to unlearn' emerged as a theme. Two cycles of coding contributed to the analytical process; the first sought to break down the data systematically, ascribe meaning and uncover patterns within the data, while the second cycle aimed to classify, prioritise and integrate the data, drawing on field notes of observations and knowledge derived from the first cycle to refine the codes and organise them into meaningful categories. During the second cycle a decision was taken to use *in vivo* coding for some, but not all, codes, using informants' own words to classify the data, since this augments and recognises the

'voice' of participants. This in turn can be a powerful tool in making sense of and interpreting qualitative data (Saldana, 2016). The *in vivo* coding was particularly useful when firefighters used professional terminology specific to the practices they were attempting to learn or unlearn, such as the code 'board failure' referring to the telemetry boards used to calculate the remaining oxygen in the new breathing apparatus. These were concepts emerging from the data and often entirely new to the authors.

This combination of methods and perspectives provided a detailed account of both the formal learning firefighters were required to assimilate (through the operations manuals, EMOCs, senior management and support services) and the realities of praxis (through the interviews, focus groups and observations of the front-line firefighters). The opportunity to revisit two of the research sites three years after the initial study was particularly valuable and this phase, though significantly smaller than the first phase of the research, allowed us to observe the way the new breathing apparatus training had been adapted.

Preserving organisational memory through storytelling

The lengthy training that firefighters undertook at the start of their careers was supplemented by regular, ongoing formal training to rehearse routine skills and introduce new techniques, as well as informal tacit learning gained from watching fellow firefighters at work, listening to their stories and participating in front-line firefighting. During the fieldwork, we had ample opportunities to both see and hear about a range of innovations, most of which firefighters consented to. In the next four sections, we consider the way firefighters learned informally from one another, give an example of (organisational) forgetting, then explore the issue of consent. Consent was central to both learning and unlearning and we consider its presence and absence, drawing out the ways in which consent was given or withheld. First, we present cases where obtaining consent was easy, generally because knowledge had overtaken past practice so firefighters trusted in and generally welcomed the innovation; the second section shows consent withheld or reluctantly given, when unlearning the old ways was hard. Here, innovations were commended by top management and an official part of organisational practice, but not yet trusted by the front-line firefighters, who kept the old systems and used them in tandem with the new.

Firefighters worked in small groups or 'watches'. These groups were fairly stable and, in the 12 stations observed in this study, it was not uncommon for firefighters to have worked together for a decade or more. Firefighters worked together, trained together, and mobilised for rapid call outs together. Mutual competence was a shared responsibility and a key way in which organisational memory was preserved and maintained was through narrative and storytelling (Pratt et al., 2018). Skills, praxis and routines at Northern Fire were embedded in the collective memory. Firefighters were generally encouraged by station managers to remember by sharing both direct personal experiences and vicarious accounts. In day-to-day practice, they would swap stories around the fire station kitchen table, in fire engines on the way to fires or rescues and on the drill yard during training exercises:

One thing in the Fire Service that we excel in is that I know I've learnt, as we alluded to earlier, that through others' experience and them sort of showing me when I was a younger

firefighter, the benefit of their experience and then through the old cup of tea, round the table and listening to the stories of the guys 20 years ago when I was joining and you know running into fires 20 years ago and just things that we pick up. Yeah, I think we do that really well don't we? (Firefighter 45, Male, 17 years' experience)

Talking with other firefighters at the fire station helped keep organisational memories alive. It facilitated questioning standard firefighting techniques and practices and occasionally modifying them. Sometimes key information was written in watch-specific note-books but most often these memories were retained via narrative:

I was that person, I've been that person who's operated, who's held a wing mirror, a broken wing mirror from a car, underneath the actual fire to look up at the chimney. I've been the person on a fire station to make sure there's no washing up liquid in a washing up liquid bottle. So I can fill it up with water, put it on the fire engine for chimney fires, because you use far less water but it's just as effective as getting the hose from the fire engine to put the fire out sometimes. 'Cos you put the water on the coals, the steam then extinguishes the fire. (Firefighter 37, Male, 21 years' experience)

Interviews in all 12 stations referred to firefighters' topography as an example of organisational memory. Firefighters recalled how they would walk around their geographical area and inspect water hydrants. Watches constructed a collective mental map of the location of hydrants and their functionality:

It's called topography, we call it topography, local knowledge. So you go to a job and it might be a massive mill fire and you're thinking 'Oh God where's all the water?', you might find two or three hydrants that are crap. But [name] who's been there before'll know there's a hydrant [that works]. (Firefighter 11, Male, 9 years' experience)

In addition to this practical knowledge of their local area and the techniques that could be used to extinguish fires, firefighters shared stories of major blazes, of dealing with complicated call outs, and of environments with unexpected hazards. Memories were galvanised through storytelling. Station managers would recount their initial assessment of an incident by describing the colour and thickness of smoke emanating from a building or the quickest entry points to a builders' yard or apartment block. Firefighters told their own stories and also told the stories of others (Pratt et al., 2018). Telling them not only helped build understanding, it also formed consent (Lave and Wenger, 1991; Orr, 1996). Firefighters would discuss techniques, challenge existing wisdom and come to a shared understanding and acceptance of good praxis, which they would then pass on. They would listen to stories, observe the practice, take part in peripheral activities (finding the empty washing up liquid bottle, holding the wing mirror so that they could see the fire), then deal with the fire and take over the stories themselves. These were affirmations of practices that worked and pride in having been there ('I was that person').

This was how firefighters learned, how knowledge was retained and how communities were built in work. But stories were not a perfect mechanism for remembering. Incidents that lacked currency, or that did not entertain, or that outlasted a working lifetime, could be forgotten. The next section deals with an example of forgetting, as opposed

to unlearning, when firefighters had to deal with severe flooding. Nothing on that scale had occurred in firefighters' working lives, so they had no stories to remember and the official manuals offered guidance for dealing with floods, but had nothing for an event on that scale. Organisationally the knowledge had been forgotten.

Forgetting

Interestingly, the forgetting that we observed was organisational, rather than individual, though the solution proposed centred individuals. Firefighters at every level of the hierarchy were aware of the importance of storytelling for organisational memory. During this research, Northern Fire was subject to unprecedented flooding on an almost Biblical scale. While flood rescue techniques were a key part of firefighters' training and development, dealing with a complex, large-scale flood operation in practice was rare. Extreme flooding later became more common, but before these floods, nothing comparable had occurred in firefighters' working lives (at the time of the fieldwork they were described as a once in a century occurrence), with the result that ways of coping had been lost from the collection of stories. The firefighters tackled the floods and, in the aftermath, senior management discussed novel ways of ensuring this revitalised knowledge was retained. One firefighter central to the flood rescue operation had been sent around stations afterwards to tell his story to other watches and senior management discussed videoing him:

He's [names employee] pretty rough and ready, he's articulate in a pretty rough and ready way, but his presentation of this story is overpowering about what he did from the moment they turned at eleven o'clock in the morning to the moment where they got tipped out of the boat at seven o'clock at night and they worked continually in between. He's just a . . . he's a gruff Yorkshireman, he tells the story so powerfully that we have to capture him telling that story and find a way to share it with other people. The only way would be to video him and send it round and let people listen to it. (Incoming DCO, Male, 28 years' experience)

These videos were not completed during the fieldwork, but they had the potential to capture many of the advantages of storytelling: the entertainment value, the first-hand narrative of lived experience, and the credibility of a fellow firefighter. They were also more tangible and could be archived for inclusion in formal training materials to retain tacit knowledge. Clearly, these videos would not be an exact substitute for storytelling. In the stations, storytelling was an active, rather than a passive, means of disseminating knowledge. Storytellers would involve and engage their auditors and firefighters would often tell stories they had heard from others, as well as recounting their own experience. The consent, which storytelling secured, was a product of active engagement. Videos were more passive, but this discussion demonstrated the importance of real practice as recalled and re-told by firefighters to firefighters.

Consenting to unlearning

For these firefighters, unlearning was not the same as forgetting. Knowledge and skills that were no longer relevant to current praxis were not forgotten, they remained as interesting

memories, historical anomalies or amusing anecdotes. All forms of unlearning required the consent of the group. Firefighters needed to trust the effectiveness of any new practices, or the credibility of new knowledge, in order to consent to unlearning the old practices and replacing them with the new. During the course of the fieldwork, Northern Fire undertook a substantive review of all operational firefighting documentation. The purpose of the review was to streamline documents to make them more manageable and to ensure that they reflected best practice:

To review the whole suite of national operational guidance, erm a very sequential process, project managed by the London Fire Brigade, to look at the extended guidance that's out there and for instance I believe the numbers that are often quoted there are 8000 documents, publications, pieces of law that are appertained by the Fire and Rescue Service, some of which are hopelessly out of date. (Incoming DCO, Male, 28 years' experience)

Practices or procedures that were outdated, rarely consulted or used were examples of easy unlearning. In some instances, practices were replaced with new knowledge, in others they were simply discarded:

Is it current? Does it reflect best practice? No – basically re-write the whole lot so that is quite a linear process that is ongoing at the moment, for example there is a piece of guidance about hazardous materials which shows the best way to deal with metal on fire is to shovel on powdered asbestos. (Incoming DCO, Male, 28 years' experience)

Asbestos is a heat resistant material, which was widely used before it was found to be a health and safety hazard. There have been laws barring it in the UK since the 1980s. Interviews revealed that firefighters were aware of the reference to using powdered asbestos in the hazardous material policies and manuals. They viewed it with amusement and, while they had not forgotten the reference to this practice, it was simple to discard routines that were clearly dangerous. Unlearning was easy to achieve when firefighters trusted in the new techniques or knowledge:

Well book eleven in particular, so like I've done my FE [firemanship] exams. So they refer to book eleven, they keep referring back to this book eleven, you've got to read this. And in book eleven they talk about percolating hose. Now percolating hoses haven't been in this brigade in 40 years, probably since when your dad [points to colleague] first started. You know and it's gone, it's obsolete. (Firefighter 50, Male, 7 years' experience)

Consent was also readily obtained when an innovation represented an improvement to current praxis. The Cleveland Load was a technique originating from the USA where firefighters coil and recoil a hose reel into a tightly packed structure. The coil was then picked up by firefighters and easily taken to the top of high-rise buildings or apartment blocks, using water pressure to roll out the hose effectively without kinks. It replaced the old technique of laying out a fire hose at the entry point of a building and avoided the hose reel snagging or objects pressing upon it causing drops in water pressure. Data obtained from all 12 stations revealed that unlearning the old hose reel technique and learning the new one was a straightforward process:

Yeah it works. It's kind of more difficult in as much you have to roll the hose in a certain way, you have to change it in a certain way. There's new things to learn, but everyone's forgotten the old ways, just like that because the old way was a pain in the arse to be fair. So if yeah, so if. . . it is easy to move on, even though for the last 20 years people having been rolling hoses out like this, they'll pick up something new straight away 'cos it's great. (Firefighter 7, Male, 14 years' experience)

Firefighters were familiar with both the innovations and the past practice they had replaced, they accepted that the innovations were improvements and trusted their efficacy.

Reluctant consent, unlearning and refusing to forget

When firefighters trusted the innovations, consent was readily obtained. Where new technology or changes to firefighting practice were not trusted, consent was reluctant and unlearning was much more difficult. For a minority, this reluctance was manifested at any change:

We had two retirees recently, one of them, who only retired last week. He was a very good firefighter and he's dragged me round quite a few fires and through different scenarios and he was very old school. And whenever new stuff came out he'd be, 'oh bloody hell why have we got this, it's stupid. Well when I joined we didn't have to do this, you can't put a fire out with a computer' [mock voice]. And you think well [says name], it were 33 years ago. He was a classic example, he learnt something, was very, very good at it, wouldn't let go of it. (Station Manager 4, Male, 18 years' experience)

Yeah. Nine times out of 10 the old way wouldn't be the wrong way. (Firefighter 15, Male, 9 years' experience)

Such opposition to innovation was rare. As observed above, firefighters welcomed changes that improved their praxis (particularly when 'the old way was a pain in the arse'). Innovations that were not seen as improvements were not consented to so willingly. The move to EMOC systems for keeping training up to date, and the replacement of a whiteboard with an electronic rota system were greeted with irritation. Firefighters saw EMOCs as a way of forcing them to complete meaningless box-ticking exercises and electronic rotas as an unnecessarily complex way of arranging simple shift patterns. They were accepted, used and grumbled about.

For all, firefighting was seen as a practical concern, rather than a theoretical one. Troubling innovations would be challenged, but they were also worked with, discussed and adapted:

If you know the old way and the new way's not working, you can always adapt it. You know, with a lot of things we adapt in this job, sometimes. Whereas if you know two ways, then you can maybe merge the two together and get a solution. (Firefighter 7, Male, 14 years' experience)

This was apparent in the introduction of new systems to regulate the use of breathing apparatus (BA). BA equipment comprised an oxygen cylinder tank full of compressed air

and a facemask, which allowed firefighters to breathe safely in otherwise irrespirable atmospheres. There was normally 30 minutes of compressed air in each tank, which allowed firefighters a maximum of half an hour to fight fires before needing to exit a building. During the course of the research, Northern Fire adopted a new BA system. The old system involved recording everything manually on a board, noting when firefighters went into a burning building and calculating when they should leave. The new system used an electronic telemetry board that automatically calculated when firefighters should leave a building, how much oxygen they were using and allowed communication between the Incident Commander or entry controller responsible for the information on the board and the firefighter on the incident ground. The new technology was more accurate and took into account the actual work rate of firefighters, which the manual system could not. However, the new telemetry boards were vulnerable to technical faults and firefighters frequently reverted to using the old BA system:

Well problem with BA now is, if you have a board failure, you need to revert back to the old system. So you need that knowledge of both systems for it to work successfully, 'cos all it takes is, if you've forgot the old stuff and your board faults then you need to revert back to it. (Firefighter 15, Male, 9 years' experience)

All 12 stations confirmed that the simplicity of the old BA system was attractive to firefighters. It also symbolised traditional firefighting techniques and cemented trust between and within the watch. Official guidance was to use the new system without retaining the old:

Well it depends what it is really to be honest. BA is kind of almost there as a backup, you don't want to forget that. . . The only problem will come probably in when they start recruiting again, they starting learn all this electronic, press a button, the computer will say yes or no. And if it's not been taught that you'd have to physically calculate if something goes wrong with that. (Station Manager 6, Male, 18 years' experience)

For the firefighters these adaptations were improvements. They might contravene official guidance but, in the case of the BA, they offered a practical fallback for when the new equipment malfunctioned.

The regulations dictated that the new BA telemetry board be used and firefighters were encouraged to learn to forget by station managers and senior management; to let go of previous operational or technical practice. However, the new system's faults, and the risk that these faults could cost lives, meant that the firefighters did not consent. Instead, they maintained the old system in parallel with the new, securing the advantages of innovation, while ensuring colleagues would be safely monitored even if the new system developed a fault. Phase two of the study, three years on from the main findings, found that consent had never been fully given to the new BA telemetry system and both old and new systems were still used together. In acknowledgement of the advantages of this hybrid, the old system had been formally incorporated into both practice and training. Here, the old knowledge was retained and reintroduced in the new practice.

Discussion and conclusions

For the firefighters in this study, learning and unlearning were a regular feature of work. While some firefighters condemned any new knowledge, innovations that were demonstrable improvements to praxis attracted willing consent from the majority. However, when innovations were not improvements, or when, as in the case of the new BA telemetry kits, they were unreliable, consent was reluctant. When this happened, firefighters engaged with the innovations, adapting them until they worked, or retained the old system in tandem with the new. In this study, unlearning did not involve forgetting. When new knowledge was accepted, outdated knowledge was remembered as a conversation piece, as the way things used to be or as a source of humour; memories that reminded the firefighters why they had consented to the improvements. When new knowledge was unreliable, the old technologies and practices were used to adapt the innovations and to make practice safer.

In some respects, this was a distinctive organisation. Firefighters worked in strong, stable groups. Many were long serving and at least one was a member of the same station that his father had worked in. In such circumstances relationships are strong and memories long lasting. These features would make this a poor choice of site for an exploration of organisational memory loss through turnover (Carly, 1992; De Holan and Phillips, 2004; Massingham, 2008), but they render it an exemplary arena to study the way people are involved in these processes and to examine the human side of learning, forgetting and unlearning. An area for investigation that is both important and neglected. The existing unlearning literature has obscured and ignored the people who learn and unlearn, with the result that it struggles to assess how unlearning happens or fails to happen; why innovations are resisted; or even what workers do or do not know. This research theorises the *presence* rather than the absence of people in unlearning. The social processes relating to unlearning and organisational memory, the difference between unlearning and forgetting and the importance of consent to organisational innovation, are relevant far beyond the UK Fire and Rescue Service. This article aims to remedy some of these omissions. Because this research captured so many perspectives on knowledge and routines, covering organisational systems and procedures, support services, senior management, line management and front-line firefighters, it was able to examine both organisational memory loss (forgetting how to deal with major floods) and the ways workers responded to unlearning.

Theoretically, this article makes three important, and related, contributions: (i) it demonstrates the weaknesses of the clean slate approach. The unlearning observed here was not discarding, deleting or abandoning knowledge (Tsang and Zahra, 2008). Unlearning did not require previous knowledge to be forgotten and, given the way the human memory works, such lapses would have been unlikely (Howells and Scholderer, 2016; Klein, 1989). The firefighters in this study retained their knowledge of old routines and practices; (ii) it challenges Baumard and Starbuck's (2005) advice that successes need to be unlearned. These firefighters were more than capable of identifying when past successful practice had become obsolete, remembering them was no barrier to accepting innovations; (iii) most importantly, it develops Klein's (1989) notion of parenthetical learning. His observation that these were obsolete behaviours is an accurate

one; but these findings go beyond the idea of learning in parenthesis. This retention of old knowledge had implications. It meant that firefighters were not blank canvasses passively accepting new knowledge, practices and routines. Rather, innovations were compared to past practice. Generally, this worked to the advantage of the new routines since it demonstrated their superiority: the introduction of the Cleveland Load, the abandonment of the percolating hose and the withdrawal of advice to extinguish fires with powdered asbestos were all welcomed. When innovations were not improvements on past practice, or when, as in the case of the BA telemetry board, they were vulnerable to faults, front-line firefighters went against official guidance and continued to use both old and new systems in tandem. Consent was not automatic. When innovations were not trusted, consent was not granted.

Focusing on the human side of unlearning reveals the importance of both trust and consent. When workers remember the old systems and routines, when their presence is not whitewashed away as passive acceptance or the simple discarding of knowledge, these are central to successful implementation. It was not sufficient for innovations to exist; firefighters needed to trust them and agree to their introduction. Other studies have highlighted the ways workers choose *who* to trust (Pratt et al., 2018); here, we concentrate on the nature of the innovations themselves, how workers chose *what* to trust. Minor innovations (such as computerised scheduling and EMOCs) could be introduced with reluctant consent. Firefighters would complain, but get on with their jobs. Major changes, which were felt to endanger lives, were not so readily accepted.

When conducting research and developing theory it clearly behoves the researcher to consider alternative explanations for their findings, and one possible explanation for any reluctance to consent, is a desire to secure, maintain or extend control over work processes. This is a familiar feature in the literature (see, for example, Braverman, 1974; Cockburn, 1983; Littler, 1982; Penn, 1984). Kamoche and Maguire's (2010) miners sought to retain their pit's existing safety systems because these were controlled, monitored and trusted by miners rather than managers, their managers sought to introduce new systems to extend their own spans of control. It is possible that a desire to exercise control over work may have influenced firefighters' responses in this study: the old chalkboards, used to record when firefighters went into burning buildings, were directly under their control, the new telemetric systems were introduced by management. However, the parallels with Kamoche and Maguire's (2010) miners end here. These firefighters willingly accepted most innovations. In this research, when consent was withheld, it was because the innovations were not trusted rather than because they were not controlled. Firefighters did not reject the new BA telemetry boards, rather they sought to understand the new equipment, appreciated its strengths but observed its faults and rejected instructions to discard the old system for fear colleagues would be caught out if a board faulted while they were attending a fire. So, the new telemetric boards were introduced, but firefighters ran them in tandem with the old system of chalkboards to ensure that, should the telemetric boards fail during a call out, lives would not be put at additional risk. In acknowledgement of both the faults in the new system and the importance of consent, the official guidance was amended to encourage everyone to run both systems together. This is not to dismiss the idea of the workplace as a contested terrain, nor to argue that firefighters would not participate in such contests. Rather, it is to observe

that, within the confines of this study and for these particular innovations, it was the shared interest in extinguishing fires while keeping firefighters safe that drove or withheld consent.

Centering the people involved has provided a much-needed challenge to the literature on knowledge and unlearning, as well as suggesting a fruitful seam for future research. It is important to study knowledge at the level of the organisation, but, in their analyses, researchers, practitioners and change makers also need to appreciate that such knowledge can only be achieved by individuals learning and unlearning. Changes in organisational knowledge, routines and practices require workers to learn and unlearn, and this requires their consent.

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