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# Safety learning among young newly employed workers in three sectors: A challenge to the assumed order of things

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## ABSTRACT

Despite efforts to reduce risk by providing young workers with safety knowledge and direct them to ways of working safe, injury rates are still relatively high in this group, which point to shortcomings in the understanding of the mechanisms that are important for safety learning. Therefore, in this article we will explore the mechanisms that are involved in safety learning of young newly employed workers. We draw on data from (participant) observation with 33 young workers during their first three months at work in the metal work sector, in elderly care, and in the retail sector. The analysis point to safety learning among young newly employed workers as more than a question about giving them information about safety issues. Through experiential learning, the formal safety information they are given is at times overturned, filtered through the everyday dilemmas of the work and through normalisations of risky practices at the workplace. The results point to safety learning as an integral part of the way that these workers are inducted to and engaged in the everyday dilemmas and handling of tasks at the workplace, such as helping colleagues or debating the correct ways of doing the job. Without being trained through debating and discussing the canons and practical application of correct practice, further reduction of risks and thereby injuries at work will potentially be difficult to achieve. Following this, reducing the risk of injury among young workers must largely be based on improvements targeted not only new young workers, but in the organisational safety practice as such. This will potentially improve the safety of new workers as well as senior employees in the workplace.

## 1. Introduction

Younger workers between 18 and 30 have a higher risk of workplace injuries than do older age groups, especially during their initial weeks and months of employment (Breslin and Smith, 2005; Breslin et al., 2007; European Agency for Safety and Health at Work, 2006, 2007; Laberge and Ledoux, 2011). In Denmark, young men and women under 30 years of age are approximately 60 per cent and 70 per cent more likely (respectively) to have an occupational injury than older age groups (The National Research Centre for the Working Environment, 2018). Apart from age, new employment, part-time employment, and manual work have been shown to increase the risk of sustaining a work injury (Breslin et al., 2007; Breslin and Smith, 2010; The Danish Work Environment Authority, 2013), and these are all factors characteristic of young employees. It has been debated whether it is the age (being

young) or the factors in the workplace associated with being young (manual or unskilled work and inexperience) that are the reason why young workers are at risk of being injured at work. It now seems to be established that short job tenure and workplace factors predict occupational injury more than age or other individual factors (Breslin et al., 2007; Breslin and Smith, 2010; Laberge et al., 2016).

Nonetheless, young workers as an age group have been targets of prevention initiatives focused on shaping these workers' attitude and actions in compliance with health and safety rules (Laberge et al., 2014). Campaigns and information material about workplace safety tend to be based on socially constructed notions of young people as individual risk takers that disregards or short cuts safety, and targeted at the individual young employee and not the workplace culture (Laberge et al., 2014; Nielsen et al., 2013). These approaches communicate an ideal assumption of the mechanisms of safety learning where young workers first

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learn how to work safe (through information and training), but later drift from this secure position (hence they break the safety rules). But, what if the first weeks and months at work tells a different story about how safety learning unfolds as young workers take part in the work tasks? We already know that the effect of current initiatives on injury rates is questionable (Andersen et al., 2019; Dyreborg et al., 2013; Hale, 1984; Hanvold et al., 2019; Laberge et al., 2014; Nielsen et al., 2019a; Robson et al., 2012). It has been suggested that the reason why the use of information-giving is so widespread despite knowledge about lack of effect, is that it is an easy way to live up to health and safety obligations towards newcomers (and to document that instructions are given). In comparison, addressing and influencing cultural and organisational aspects of how they learn to risk, or how they learn to debate and question the practices at the workplace, are a more complex endeavour, even if it has already been pointed out as relevant to safety learning (Dekker, 2011; Rasmussen, 1997). In this article, we will explore the mechanisms that are involved in organisational safety learning, drawing on empirical data from young workers' induction to work in three different sectors. To do this, we will pursue the following questions: 1. how are young workers inducted into their new jobs during the initial period at work; 2. how does the induction practices affect their safety learning; and 3. how can safety learning at work for young employees be improved?

### 1.1. Induction and learning at work

As a social context, the workplace has been recognised as an important site for learning and development (Manuti et al., 2015; Tynjälä, 2008). Learning relates to purposes such as task performance, production, and problem solving, and to purposes such as individuals' awareness and understanding, development and teamwork, role performance, academic knowledge, and to capacity to judge (Eraut, 2004; Manuti et al., 2015). Learning at work has been referred to as a process of induction to the norms and expectations of the organisation and can be defined as '(...) any arrangement made to familiarise the new employee with the organisation, safety rules, general conditions of employment, and the work of the section or department in which they are employed' (Gherardi and Perrotta, 2010:85). From an organizational theory perspective learning at work can be seen as a process in which new ideas and practices are integrated into the daily activities of the organization (Hatch, 2006; Lewin, 1958; Rasmussen et al., 2014). In contemporary learning theory and organizational research, learning is also linked to organizational change (Gherardi, 2006; Nonaka and Takeuchi, 2006) and to formal and explicit forms of knowledge as well as informal and tacit knowledge (Gherardi, 2006). Within social learning theory, Bandura has proposed an understanding of learning based on observing others in order to form ideas of behaviour, which can later be put into practice. The idea that cognitive processes are part of social contexts, and that these contexts are important for learning, is therefore not new (Bandura and Walters, 1963). But, from a social constructionist perspective learning, or knowing, is related not only to context but also to participation in practice. This understanding was first advanced by the American philosopher and educational scientist John Dewey (1938). His understanding of 'experiential education' contrasted an idealised concept of knowledge and learning at the time, where learning was seen as 'installing' objective institutional knowledge in learners (at school) for them to use in other settings (at work) (Dewey, 1938; Gherardi and Nicolini, 2000). Lave and Wenger (1991) have advanced the understanding of experiential learning with the concepts 'situated learning' and 'legitimate peripheral participation in communities of practice' (Lave and Wenger, 1991). In this understanding, learning is less about a person who receives knowledge and construct appropriate behaviours by observing others, it is rather a property of the community of practice, and thus a by-product of human activity-in-context (Christensen, 2016). The community of practice comes in many forms, but is analytically constituted by different actors' participation (full or peripheral) through a set of relations between the

participants and their engagement in activities related to a common task (Christensen, 2016: 127). For apprentices, or young new workers, learning at work implies legitimate peripheral (albeit empowered) participation and a move (over time) from being a novice to becoming an experienced participant with full competence (Lave and Wenger, 1991; Christensen, 2016: 128).

### 1.2. Learning safe practice

In relation to safety learning, Gherardi and colleagues take the understanding of learning as participation even further, and state that safety learning is not the effect of taking part in the work practice; safety learning is the practice itself (Gherardi et al., 1998; Gherardi and Nicolini, 2002; Gherardi and Perrotta, 2010). This implies a shift towards an understanding of learning that is not only directed to the change of attitudes and behaviour but to a change of social practice (Gherardi and Perrotta, 2010: 87). As such, the connection between the individual, the organisation, and particular circumstances gains importance and should be viewed as a 'contextual whole' (Guile and Griffiths, 2001: 118) and as the 'reciprocal interaction between the individual and the workplace that determines learning' (Tynjälä, 2008: 12). Building on this, learning in young new employees is not only an individual endeavour, but also an organisational effort of joint participation in individual or group communication (of different sorts) from experienced workers to newcomers and back (Hodkinson et al., 2008; Tynjälä, 2008). Connecting safety learning to this understanding is not only about informing newcomers about how to behave, or how to solve problems, it is also about building new young employees' capacity to make well-informed decisions in practice (Boholm, 2019: 159). Building this capacity pertains to being included in debates and discussions of the canons and practical application of correct ethical and aesthetic practice through which they learn the sequenced or choreographed practice (Evetts, 2014; Nicolini and Monteiro, 2017) of the work. However, it is also evident, as noted by Rasmussen, that descriptions of a professional way of doing a job (and involving newcomers in it) cannot 'foresee all local contingencies of the work context and, in particular, a rule or instruction is often designed separately for a particular task in isolation whereas, in the actual situation, 'several tasks are active in a time sharing mode' (Rasmussen, 1997:6). These local contingencies can be 'risky'.

### 1.3. Learning to risk

As risk has often been described as the opposite of safety, initiatives to enhance safety has mostly been approached through focusing on risk events and the potential for their safe management (Dekker, 2011; Provan et al. 2019; Reason, 1998; Vaughan, 1998). Even though organisational safety management measures as well as safety culture approaches has been at the fore in relation to risk management more individualised understandings of risk and safety has dominated the safety approaches in many organisations (Vaughan, 1998). According to Vaughan's analysis of the Challenger accident in the American space shuttle programme the organisational production of acceptable risks point to organisational deviances, and not individual actions as the reason why this particular accident could happen. Although advanced in a very different setting than ours, the idea of organisational normalisation lends relevance to thinking about how new young employees learn to risk as part of their induction to the work. They learn to filter sensations of uncertainty as normal sensations, even when they have knowledge of safer ways of working (Grytnes, 2018; Vaughan, 1998).

Therefore, focus should not be on human errors and violations, but on the mechanisms generating behaviours in the actual, dynamic work context (Rasmussen, 1997). To better understand and interpret the empirical findings of the study, we draw on Rasmussen's (1997) descriptive dynamic model on 'migration toward the boundary of acceptable safety performance'. Rasmussen's dynamic safety model describes a safe space for work activities within three boundaries, i.e.,

boundary of economic failure, boundary of work overload and boundary of unsafe work activities (Cook and Rasmussen, 2005; Rasmussen, 1997). Keeping within these boundaries constitutes a 'safe space', which means the risk of accidents or other occupational safety and health problems are within acceptable limits. However, this 'safe space' is influenced by gradients of cost effectiveness and of least workload, that push work activities towards the boundary of unsafe work performance (potentially causing accidents or other risks).

Therefore, exploring exactly in what ways situated learning takes place in specific work settings (communities of practice) and how, in these various settings, young employees are inducted into normalised ways of establishing the 'safe space' (or trespassing it) is important in order to understand how young workers learn to (handle) risk.

## 2. Material and methods

### 2.1. Young workers in the three sectors

This study was conducted as a qualitative multi-case study (Flyvbjerg, 2006) of how induction practices for young workers in the metal work sector, the elderly care sector, and in the retail sector (traditional and discount supermarkets) take place. These three sectors were chosen to provide differentiation with regard to types of employment and degree of young workers' prior experience/ and knowledge needed for the job, gender, proportion of young workers, OHS risks, and to provide differentiation with regard to workplace learning and safety learning in young workers (see Table 1).

In the metal work sector, a large proportion of young people are employed as apprentices or as skilled workers in private companies. This means that the metal sector potentially represents a study setting where professional norms and values are at the centre of the induction of young workers as everybody has the same educational background. The proportion of young employees is significantly lower than in the retail sector, and young employees mostly work full-time. More than 33% of workers in the metal industry are over 50 years old, while only around 10% are under 30 years old (Industrisamarbejdet, 2016; Ministry of Education, 2021). The most common risks are falls, being hit by objects, and acute overexertion injuries overexertion due to sudden and unexpected exposure from lifting, carrying, pushing, or pulling heavy objects or doing work in an awkward position (European Commission. European Statistics on Accidents at Work (ESAW), 2013), as these account for 60% of all injuries in the metal industry (The Danish Work Environment Authority, 2014).

In the elderly care sector the proportion of young employees is also lower than in the retail sector with more than half of the employees in social and health care being over 45 years old (Ministry of Education, 2021). Work in this sector has traditionally been perceived as low status and dominated by women (Jensen, 2012; Kamp and Hvid, 2011). Today most of the young workers currently employed in this sector are skilled (trained social and health care workers and nurses), but there are also young workers employed as student workers, unskilled temporary

**Table 1**  
Overview of young workers in three sectors.

|                                       | Metal industry                                     | Elderly care   | Retail   |
|---------------------------------------|--|--|--|
| <b>Type of employment and company</b> | Skilled, private company                           | Skilled, public care homes   | Unskilled, private company   |
| <b>Gender</b>                         | Male dominated                                     | Female dominated   | Mixed gender   |
| <b>Proportion of young workers</b>    | Few young workers                                  | Few young workers  | Many young workers   |
| <b>OHS/ risks</b>                     | Falls, hit by objects, acute overexertion injuries | Acute overexertion injuries, falls, violence and traumatic incidents | Acute overexertion injuries, falls, violence and traumatic incidents |

workers, and apprentices (Jensen et al., 2010). This means that the elderly care sector represents a study setting where professional norms and values are central to the induction practice as the most employees are skilled workers. In contrast to the metal sector, elderly care in Denmark is primarily part of the welfare state and is the responsibility of the local municipalities. Work environment risks in this field include acute overexertion injuries (45% of all injuries), falls (25% of all injuries), violence, and traumatic incidents (20% of all injuries) (Borg et al., 2007; The Danish Work Environment Authority, 2014).

The retail sector in Denmark has traditionally employed many young workers in a variety of jobs (Ilsøe and Felbo-Kolding, 2014; Rafnsdóttir, 1999), and they make up about 55% of the employed. The majority of these workers are unskilled and on various forms of part-time contracts, primarily covering work hours at the weekend and after 3 pm on weekdays (Esbjerg et al., 2010; Ilsøe and Felbo-Kolding, 2014; Nielsen et al., 2014). This means that the retail sector represents a study setting where professional standards potentially are less in focus in the induction of young employees, as compared to the two other sectors in the study. Young workers in the retail sector are a heterogeneous group, and their work tasks and positions differ greatly. They can be employed in traditional supermarkets or discount supermarkets. Some are employed as apprentices; others are employed on the basis of short-term, part-time contracts during university holidays, and yet others – often those pursuing a career in the retail sector – are employed as skilled workers with managerial responsibility, but also on wage subsidy contracts (Nielsen et al., 2013). Work environment risks in the retail sector are acute overexertion injuries accounts for 38% of injuries in traditional supermarkets and 29% in discount supermarkets, falls account for 27% and 18% of injuries respectively, and violence and traumatic incidents account for 11% and 31% of injuries respectively (The Danish Work Environment Authority, 2014).

The sectors where chosen because they represent differences in types of employment and companies, in gender and proportion of young workers at the workplace, as well as differences in OHS/risks. For example, we expected to find differences in learning in sectors where older, more experienced colleagues are responsible for the induction of young employees compared to settings where a younger, less experienced, transient workforce are responsible for the induction.

### 2.2. Recruitment

Recruitment of the 13 young workers in the metal work sector was

**Table 2**  
Characteristics of participants and number of interviews in three sectors.

|   | Metal industry                                     | Elderly care   | Retail   |
|---|--|--|--|
| Number of workplaces                                    | 5  | 7  | 5  |
| Young employees in the age group 18–30 years            | 11 apprentices<br>2 skilled industrial blacksmiths | 3 unskilled social and healthcare assistants<br>6 skilled social and healthcare assistants<br>1 skilled healthcare assistant nurse | 2 skilled workers,<br>3 apprentices,<br>1 sabbatical year student,<br>3 part-time student workers,<br>1 temporary worker |
| No. of days with observations                           | 15   | 14   | 10   |
| No. interviews young workers                            | 13 during fieldwork<br>8 after fieldwork           | 8 during fieldwork<br>6 after fieldwork  | 10 during fieldwork<br>5 after fieldwork   |
| No. interviews with colleagues, supervisors or managers | 20 after fieldwork                                 | 18 after fieldwork   | 7 after fieldwork  |
| Total no. interviews                                    | 41   | 32   | 22   |

made through a local vocational education training centre. They worked in five different companies, whose managers also agreed to participate (Table 2).

Recruitment of the 10 young workers in elderly care homes was conducted through the municipality's health and safety consultant and educational coordinator for elderly care apprentices. The participants were all women and employed at seven elderly care homes, although one participant was unable to maintain regular working hours, and therefore only participated in the study for 1 day.

Recruitment of 10 young workers in the retail sector was conducted through the local union in the greater Copenhagen area, through whom contact to three different supermarket chains was established. The regional managers of these supermarket chains gave access to four small discount supermarkets and one traditional supermarket. Ten young workers about to begin work in the different supermarkets at the time of the project agreed to participate.

### 2.3. Data collection

We followed the 33 young workers the first three months at work (Czarniawska, 2007). At each workplace the researcher started fieldwork within the first few days or weeks of the young worker's employment, and conducted qualitative short-term fieldwork (1–3 days in each workplace). This included in total 95 semi-structured interviews with young employees (several of them were interviewed at the beginning of their job and again after three months), their closest colleague or supervisor, and their manager (Table 2). The young workers and their closest colleagues were informed of the study, and it was explained that the focus was to understand how young workers are received at the workplace and how they learn the new job, and that we were especially interested in safety aspects of the job.

Fieldwork was conducted through observations and interviews that focused on induction practices. In order to get knowledge about the learning processes we listened to the instructions and explanations given to the young employee from the supervisor or the colleague who introduced them to the work, formally and informally. We observed and asked about 1) the formal aspects of the induction and how safety was introduced (info material handed out, instructions to the use of material, machines, tools, educational courses), 2) the informal aspects in relation to the work (who the young workers followed colleagues/managers/supervisors, conversations about the work between co-workers and the new employee, and the use and handling of tools and machines), and 3) how tasks were assigned to the new employee (when and how were learning aspects of the job articulated or acted out in practice, how the young employee came to use what he or she had been informed of or introduced to).

In field notes we described from what we observed, how the young worker was given information about the work; how they were shown to do the tasks and told about the right and wrong ways of doing things; informed about company politics and procedures, and assigned responsibilities. When the young workers started to perform the tasks, we asked them, whether they knew how to do it and how they felt about it. For ethical reasons, in elderly care where the work involves taking care of elderly people, the young worker and the closest colleague decided if and when the researcher could accompany them into elderly person's private rooms/ departments. If it was considered as something that would confuse them or interrupt their routine in any way, the researcher waited outside. Across all cases the researchers attempted to make room for reflections on the peculiar situation of having a researcher present, while at the same time keep low in order not to interfere with their induction. As will be evident in the results section, our questions about the practice might, however, have had an impact. The first author conducted the fieldwork in the elderly care sector, the second author conducted the fieldwork in the retail sector, and the third and fourth author did the field work in the metal work sector.

A semi-structured interview guide was used across the sectors and

workplaces to ensure comparability. For example, the young workers were asked to describe what happened their first day at work; how they felt the first day at work; to tell about what they thought were the most valuable thing they had learned during the first period at work and how they realised this; how they came to know this (from whom); had they felt at risks at some point or experienced an incident; or had anyone told them about issues related to safety and how were this conveyed to them. Through the interviews, we sought to reflect on the observations we had made during observations and to ask them to describe things that had happened that we had not had the opportunity to observe. Colleagues/supervisors and managers were also interviewed focusing on their role in inducting the new workers and standards at the workplace (in all 45 colleagues and managers were interviewed). We also conducted follow-up interviews with 19 of the young workers three months after fieldwork focusing on their job situation, and what they thought about what they had learned in hindsight. All interviews were conducted during work hours.

### 2.4. Data analysis

All interviews were transcribed verbatim, and analysed together with notes from the participant observations in the workplaces. All the transcriptions were read by all the authors, then categorised into themes, first deductively according to our preunderstanding (inherent in the questions developed for the semi-structured interview guide), and after identifying these themes, we approached the data more inductively, to open up the analysis to emergent new themes. To this end, data from our field notes on specific work situations proved especially useful.

After having read and re-read the data material and identified themes and narratives among the young employees, their colleagues, and their managers, we constructed 'ethnographic tales' (Van Maanen, 2010) for each of the 33 young workers in order to highlight how the safety learning processes were part of the everyday practices at the workplaces. Some of the tales were more fully developed than others, as we had 'thicker' data (Geertz, 1973) in some of the young workers' cases. For example, with regard to how many interactions they had with managers or colleagues, how complex the tasks were, how vividly the young workers' descriptions were, or how we as researchers were involved or allowed to participate during the induction. The construction of the tales is an analytic process that involves reading all the material, identifying themes, and attempting to translate the material in an interpretive manner (Van Maanen, 2010). Using this method across the data from the three sectors the ethnographic validity was evaluated among the researchers, focusing on the credibility of the constructed tales, and whether the ethnographic tales appeared authentic, nuanced, convincing and meaningful in relation to the context. In this article, we use the understandings achieved from the ethnographic tales, but the tales are not referred to directly, as they would be too long for the purpose of this article. Instead, quotes from the interviews or field notes is used. The quotes condense the central analytical points of how safety learning is practiced, how deviances are normalised, and how the learning of skills and development of competence within different professional sectors takes place.

## 3. Results

In the following section, we turn to the analysis of young workers' safety learning in the three sectors.

### 3.1. Metal work sector

In metal work, apprentices are introduced to the work through first observing for a few days, and then taking part in the day-to-day tasks. The metal work supervisors told us, that they considered the work to be complex and specialised, and drew on canonised professional standards that the young workers need to learn. What they did during the first

couple of weeks was to introduce the new workers by letting them spend time observing others working, a method they described as 'watch and learn'. As such, the induction process in the metal work sector largely focuses on the tacit and physical mastering of skilled tasks, but the apprentices are also given formal and written information about practical issues related to the workplace interior, daily routines, and safety. In particular, the availability of personal protective equipment was emphasised, and thereby their own responsibility to take care of themselves.

One of the young skilled workers explained to us:

*'They [the managers] gave me an employee manual that I flicked through; it said something about general rules on safety (...). I find that there is this perception [in the workplace] that, when we graduate, you have a general knowledge about how to take care of yourself. (...) And if you take care of yourself, there is no need for them [the colleagues] to keep an eye on you, or explain to you how things are done'.*

From this perspective, safety is equated with professionalism and workmanship and therefore also seems to be a natural and non-reflected aspect of the professional choreographed practice (Nicolini and Monteiro, 2017). For the young skilled employees, safety inductions were based on an assumption that they already knew about safety standards; thus these inductions merely contained information about local and company-specific aspects.

However, some of the apprentices had a different experience of being constantly reminded about potential dangers for example when using a grinding machine, and one of them explained:

*'I have used it a thousand times at school, but they tell me anyway, "be sure not to wear a t-shirt that can melt (...), or remember your glasses." I know this, but they just remind me briefly anyway'.*

As such, the professional standards that this form of induction taps into is the already existing professional knowledge and knowledge about safety that the apprentices or young skilled workers had beforehand. As such the induction builds on this and is supplemented by context-specific reminders about safety issues in real time. However, there were differences between the companies with regard to the induction. One company promoted safety in a more formalised way compared to the other companies, and this was explained to us as due to higher safety standards relevant to their engagement with the aviation industry. In this company, the apprentice referred to safety as something integral to the job.

In other metal companies, apprentices were subjected to less formalised types of induction practices. In one company, the new apprentices circulated among the experienced colleagues that they observed and worked alongside. Even though there was no extra time allocated to the colleagues for the induction of the new employee the induction included the opportunity to move from first observing and then given tasks and included therefore the informal and tacit aspects of the professional practice and safety learning. However, this also meant that the safety learning was not always safe as the following observation can illustrate:

*'I [the researcher] suddenly smell burnt metal coming from somewhere. One of the journeymen is using what they refer to as the 'dentist grinder' to drill a hole for a power line in a bracket. The apprentice is standing behind him, watching. As the journeyman works, he keeps his head close to the bracket and the grinder. He works without gloves, glasses, or a mask. "It is stainless steel; it is actually dangerous because of the formation of nanoparticles", he says. I [the researcher] ask him if they are using ventilation. He points towards a ventilation pipe on the other end of the work station and say: "We have that, but we're just not good at using it"'.*

This illustrates how the tacit organisational practice deviate from safety standards that they have knowledge of, but that is not part of the

daily practice. Normalisation is rather a disconnection of theory and practice, than an active disregard for safety. This affected safety learning as the sensations of the smell of burnt metal and the presence of the ventilation pipe is being normalised as nothing to act on (Vaughan, 1998). A safety practice of deviance, of not protecting oneself from nanoparticles, is constituted as a professional practice that the apprentice participates in. So, despite the journeyman's readiness to share his knowledge about his notion of the dangers of nanoparticles, his fear of inhaling these particles does not make him use the ventilation. Rather, the informal, ad hoc information on how to avoid risks is articulated as something that one can be bad at or good at, and the connection between this information about nanoparticles and the professional safety practice is therefore left to the individual worker to manage, in this case the young employee. One apprentice described how he took special precautions only during the riskier parts of the grinding process. Based on his experience he considers how long it will take him to perform the task and the risk it involves. Therefore, the paradox of the safety learning is, that the non-canonised practice of 'not being good at using ventilation' amounts to normalisation of deviant practice despite intentions to safely induct new workers.

The organisational practice where the apprentice is 'learning to risk' is an example of the basic mechanisms generating safe or unsafe behaviour in the actual, dynamic work context (Rasmussen, 1997). In this dynamic context there seems to be a strong belief in the impact of formal safety induction on the safety learning, even if the new apprentices' participation in the 'watch and learn' practice evidently shows that normalisation of risk is part of this practice. These observations also illustrate how the practice of safety learning involves not only information giving and direct instructions (written or oral), but that this 'watch and learn' practice involves the apprentices in the common task as part of their participation in the community of practice at the workplaces. This practice also involves normalisation of deviance (Vaughan, 1998). This point to how the handling of everyday discrepancies between the ideal and the practise of workplace safety issues, setting of a mechanism moving towards the limits of safe practices (Rasmussen, 1997). In a safety science perspective, the non-use of ventilation poses a risk, but our observations pointed to this as a normal albeit deviant way of working.

Exactly how the deviances from professional safety standards are normalised depends on the specific company's safety management that the young workers are inducted to, and their possibilities to question risky handling of tasks is related to this.

### 3.2. Elderly care

We found the most formalised form of induction of new workers in elderly care. On their first day at work most workers participated in a course related to the moving of patients. Apprentice workers attended longer courses and completed longer periods of peer-to-peer training than did unskilled part-time workers and student workers, but the elements were the same. After the initial course, a period of 'walking with an experienced colleague', which included getting information about the organisation and accompanying the experienced colleague while he/she performed daily tasks. These tasks included bathing the residents, distributing the residents' food, taking part in social events, ensuring the residents could take an afternoon rest, and performing morning and evening routines. As part of this, the new employee was introduced to reporting systems, i.e. the medical records on the computer. Additionally, apprentices were assigned a supervisor and close co-worker during their first few days at work.

Care of patients was considered something that the young workers should learn, as very few were expected to know the work in advance. The close cooperation with the experienced colleague was recognised as important to get knowledge about the details of the work tasks, as the following quote from an apprentice illustrates:

*'Before we enter (the elderly person's room), I (the new employee) get to know a little bit about who the person is, his or her resources and difficulties, what they are capable of by themselves (and what they need help with) and diseases and health information and so on'.*

The information that the new employee is given at this point is concrete and directly relevant to the task at hand, and the practical induction focuses on the apprentices being able to take part in the work by copying what they have observed the experienced workers do. The induction of new workers in elderly care focuses on reflecting on and explaining how and why things are done according to the professional canons. We observed that the apprentices regularly discussed how to solve the dilemmas they encountered with their supervisors. This involved observing and dealing with changes in patients' conditions, using medication, technical equipment, and social activation, and dealing with psychological aspects. As a part of this induction, they were encouraged to use professional vocabulary, document their work in the filing system, and reflecting on their learning in weekly sessions with their supervisor. Their induction into work was therefore also an induction into the profession through an engagement with ethical and practical aspects of the job (Gherardi and Perrotta, 2010), and not only to the practical tasks at hand.

For the colleagues it was important that the new employees were able to perform tasks according to the professional standards, as 'we usually do', which referred to keeping up the routines that the individual elderly person preferred and was used to. The new workers were encouraged to be empathetic and to imagine themselves in the elderly person's position. This exercise was designed to highlight the importance of ensuring that the routine of the individual elderly person was followed, and tacit and informal ways of learning was combined with formal references to professional practices. This example also shows how specific, material, and technical aspects of the work are shown to the new young employee and how he/she is expected to first observe and then participate in the same canonised professional practices. The practical training period amounts to legitimate peripheral participation and is an example of induction to the work that is routinised and draw on cognitive learning approaches in the form of educational courses and information material, as well as learning approaches that draw on tacit professional knowledge at the workplace. As already mentioned, the professional practice of how to move patients forms a large part of the induction practice, but, at the same time, these canonised practice sometimes conflict with the day-to-day practices, e.g., norms of helping colleagues and getting things done, and thereby pushes the 'safe space' (Rasmussen, 1997).

These daily practices embodied a particular risk for some of the unskilled temporary workers, as their induction was shorter (2–3 days), and because they were expected to work like 'one of the others' after only a brief induction period (Nielsen et al., 2017). During fieldwork, we observed the following incident during a temporary student worker's second day at work:

*'At first I thought; he [the patient] is going down to his room, that's all. That's simple. But as we approached his room, I started thinking: well, what is it that he wants to do in his room? Does he want to sit up, does he want to lie down, and does he need to use the toilet or something? Is he able to do it himself, or do I have to help him? I was really in doubt about it, because I have not experienced it with him before, or with any of the others, really'.*

This quotation illustrates how 'simple things' are intertwined with professional practices that the young worker has not yet learned, and they are therefore related to safety practices that are not put into words, rather knowledge about how to perform the work are seen as common sense and taken for granted. It was only when the young worker actually engaged in the task of taking the elderly person to his room, she realised that she did not know the patient's abilities. She did not know what she could expect him to be able to do by himself, and consequently she was

unable to know how to solve the task in a safe way. This shows how the chronology of actions is not as simple for newcomers as it is for experienced workers. The quotation illustrates how sensations of insecurity surface, even though the temporary student worker had taken part in courses about how to help patients to get into bed unaided. Despite having participated in the mandatory courses about moving patients, and being assigned a supervisor from her first few days at work, she is still unclear about how to do the job.

Young new workers in elderly care are inducted to a community of practice in which the work is understood in relation to a professional practice of empathy and routine. The information that is given, and the educational courses they take part in, is closely related to canonised standards for this practice. After the initial courses, the young workers are assigned care worker tasks and learning in this sector centres around gradually assigning them more complex tasks. However, what they know does not always correspond to the tasks at hand, and therefore they learn safety as they go. As such, safety learning is an intrinsic part of the induction practices, rather than something that takes place before they start to work. Safety learning therefore, also includes the learning of (and from) unsafe or deviant practices which are normalised and left to the individual young workers own judgement.

### 3.3. Retail sector

The induction into work in the retail sector invariably consists of the newly employed workers being taken on a short tour of the supermarket after which they are shown how to work as a cashier or put to work on the supermarket floor alongside a colleague, or occasionally a manager. One of the managers described the induction of new workers in the following way:

*'Of course, the first thing I do is to introduce them to their fellow employees at work that day. Then I give them a tour around the store. So they get to see where things are, and what the supermarket looks like. I show them the baler, how the computers work, and things like that. Then they go either with me or some of the others, and we do things together. So basically, what I or the other employee does is also what the new person does'.*

*Induction practices are thus directly related to their participation in the core work tasks: stacking the shelves, removing cartons and boxes, and working as a cashier. When asked what was important when starting as a new employee in the retail sector, one of the young employees explained: 'When I started it was just work, straight up. I think they just want you to do something, really. Yes, do as you are told. (...) It's about, if you are lifting boxes, it's important that you give it all you've got'.*

Differences between discount supermarkets and traditional supermarkets were evident. The professional induction practices of discount supermarkets were informal in character and written information or educational courses were largely absent, but the 'tour' around the store were almost formalised as a routine practice. Field notes from one of the new employees in one of the discount supermarkets obtained during fieldwork further illustrate this form of induction:

*'She [the new employee] has to put vegetables on the shelves together with a colleague [who has been employed in a temporary position for only 1 week]. I notice how they push the cart with empty cardboard boxes into the back room. The empty boxes are meant to go into the baler. The colleague asks if she [the new employee] has tried to start it, and points to the baler. No. 'You just press the yellow button'. She nods and they return to the store again. The new employee has not previously been introduced to the baler, and as long as the observation takes part, she does not get any introduction to it again'.*

Across the participants in the discount supermarkets, an understanding of the work as 'something you just do' was communicated. As the quotation indicates, the task was rather something you do. Also, the

new employee was often introduced to work in the supermarket by another young colleague with limited experience.

In the traditional supermarket, induction practices were somewhat different where the work were understood as a professional practice that the young workers had to learn. Routines and canonised norms were pointed out to them, and experienced colleagues were responsible for the introduction to specific work tasks, such as making product exhibitions. We noted that the traditional supermarket manager instructed the apprentice on how to approach the task, and also provided some practical, detailed instructions for the job. When leaving the apprentice, he said, *'Call for me when the task is done'*, at which point he evaluated the work and advised the apprentice on how he could improve it next time. Learning how to do the job was described by one of the managers as *'moving forward slowly'*, and *'next time they can take some more'*. The young employee is introduced to canonised norms about how to set up a proper exhibition through instructions, hands-on work, and corrections and evaluations related to specific tasks. As such every day participation in the work tasks were discussed and corrected as part of the professional practice.

In the discount supermarkets, the young employees were given little time to observe how the work was done and gradually move on to engage in the tasks themselves, as illustrated in the example where the young worker was briefly told how to push a button on the bailer. The same young worker was later told to stack vegetables on the shelves. Her manager told her to *'use a trolley in order to avoid heavy lifting'*. But, later, when the manager came to help the new employee, the manager lifted two heavy boxes of nectarines. Because the boxes were on the floor, he had to bend over and exert force to lift them. While we were there, nobody mentioned the trolley, or taking care of ones back. The central positioned manger performs the work through a bodily routine of how to move boxes, and these practices are shared and learned through participating in the practices. The sharing of practice is what constitutes this community of practice.

In this case, even if the manager had referred to a general norm of being cautious when lifting, what the young worker learned was to sort the boxes and place the goods on the shelves in an efficient manner. General knowledge about the prevention of back injuries was bypassed. Thereby a deviant practice was normalised (as something we just do) and emerged as a tacit norm of getting things done quickly. As such, this points to a safety practice in which tacit norms of doing the job bypasses the safety information that were in fact given. There were few references to professional canonised standards in everyday practice, rather, colleagues with experience and knowledge of these standards, were rare, as one young worker explained:

*'She explains that the only one who has mentioned anything to her about safety during her first period of work is a colleague who works part-time on a wage subsidy programme. He is the only one who cares about safety, she says. When he happens to work next to her, he also helps her and offers good advice on how to do the tasks safely. Unfortunately, she says, his contract ends soon'.*

According to safety learning in this supermarket, the workers are lucky if they happen to work with someone who can show them how to do things safely.

The community of practice that most of the young employees in retail are inducted to lacks the informed culture referred to by Reason (1998). This situation leaves little room for the novice to take part in the job tasks alongside the experienced, competent worker. Moving to become an employee that fully participate as an experienced participant happens almost instantly. Thus, tacit safety practices at the workplace dominates and this leaves the young employees with few opportunities to question, debate or reflect on alternative, safer ways of doing the job.

In the following, we will discuss our findings on how young workers are inducted into their new jobs, how induction affect safety learning, and how safety for young employees can be improved.

#### 4. Discussion

This study highlights safety learning in young employees as a form of practice based competence developed through observing and taking part in specific work communities. In metal work and elderly care, young employees are inducted to a professionalised work practice that are understood as something they have to learn. Induction include a period of watching and learning from experienced colleagues and getting information material and taking part in educational courses related to safety. As such, individual as well as organisational aspects of learning are involved, which amounts to a way of learning in which the young worker takes part in the community of practice as a novice (Lave and Wenger, 1991). This involves a set of relations between their experienced colleagues, the activity at the workplace and the professional or educational community over time (Christensen, 2016). However, in elderly care, nonskilled young workers' induction is fast-tracked, as they are expected to take part in the work task within a couple of days, despite having very little experience before they started their job. Looking to the retail sector, induction of new employees is influenced by the notion that the young employees' duties are routine and simple, and (especially in discount stores) little effort is therefore put into the induction of the new employee. As a situated practice safety learning is based on a short introduction to the store (and short time observation of cashier work) before the young employee was put to work right away. Thus, the young employees learn from taking part in the organisational practice, but in this community the young workers move swiftly to take part as full participants. Little time is allocated to induction, and they work with colleagues that are often young, and newly employed, themselves. This leaves minimal room for taking part from the learning position of a novice that Lave and Wenger describe.

The results point to safety learning among young newly employed workers as more than a question about getting information about safety issues. Rather it is about how these workers are inducted to and engaged in the everyday dilemmas at the workplace, such as helping colleagues or debating the correct ways of doing the job (Manuti et al., 2015; Markauskaite and Goodyear, 2014: 83; Tynjälä, 2008). It appears that the different sectors' induction practices differ with respect to kind of employment, the young employees' prior experience, to professional notions of the work, and with respect to how individual and organisational aspects of learning is weighted at the workplace. But across the cases, safety learning, pertains to how and when young employees are integrated into the community of practice at work; how and by whom deviance from safe practices is debated and handled in the course of work; and how safety learning is connected to the development of skills and competence over time. As the examples of the lifting of fruit boxes in retail and the helping of the elderly man to his room in elderly care shows, the young employees do what they sense others do and try to help their colleagues even if they do not yet have the competences to do so (Eraut, 2004). Nielsen and colleagues have pointed to induction of young people as dependent on the young workers' form of employment or the young workers' status (Nielsen et al., 2013; Nielsen et al., 2019a). This were confirmed in this study. The young workers who were employed as apprentices, had longer periods of induction and training than did unskilled workers. This is paradoxical, because the apprentices were better informed about the professional practice already before they started working. The unskilled young workers in retail and in elderly care, who knew less before they started and got less information and training when they started, were also those who were expected to fast-track their learning, which meant that they had to move swiftly into full participation in the work tasks almost from day one. The negative implications for work place safety of unskilled young workers seems apparent.

The results indicate that, as a norm, safety information were part of the formal induction across all the workplaces in this study (although it differed in scale), but deviance from the formal induction were normalised in the daily practice. In the case in which the ventilation system

in the metal work company was not used, the young worker observed that the experienced worker used the 'dentist grinder', and only when the researcher noticed - and asked about - the smell, was reference made to the potential dangers of the task by the experienced worker. The question is whether young workers learn to take risks as part of their induction? According to Vaughan (1998; 2004) accidents are a result of 'socially organised mistakes' which are systematically reproduced (and normalised) over time in an organisational culture. Therefore, she argues, the causes of accidents transcended individuals and time. Our results resonate with Vaughan's notion of normalisation, but our study also points to a form of backwards normalisation, in the sense that often the young workers lack the information and knowledge from which practice deviate or they only have a brief knowledge about it. Instead, they get the information about the potential dangers after these dangers have materialised which results in a retrospect understanding of safety (Weick et al., 2005). Even though information on the potential dangers is given, and the task retrospectively is seen as risky, the unsafe practice continues despite of this knowledge. In that sense, practice outweighs, or normalises, the risk in question. In the example regarding the metal work, the induction practices were aimed at informing and showing the new worker how to do things and outline the procedural practices. As it appears, there were instances where their colleagues departed from this canonised practice, and unlike the example of the ventilation these 'drifts' from the standard practice were often not explicitly mentioned or discussed. Experiential learning therefore cannot be termed as being 'good' as such, rather the young employees learn how to reason in accordance with workplace norms (Tynjälä, 2008). Based on this study, we argue, that safety learning includes normalisation of risk as the (new) normal. Young workers are, for the variety of reasons shown in the analysis, trained to work unsafely by drifting and sometimes crossing the boundaries of the safe space. Thus, they learn safer or alternative ways of working in retrospect after the risk manifests itself. Instead of focusing solely on safety- aspects of training, or defining safety learning as good or bad, acknowledging the integrated, and sometimes retrospect aspects of safety learning, is vital.

The results support earlier studies that indicate that a cognitive-based, individually oriented approach to safety learning is too simple and can stand in the way for seeing the mechanisms that generate safety learning (c.f. Rasmussen, 1997). The results points to young workers taking part in work practices that unfolds within and across the boundaries for safe work. The 'safe space' of young new employees cannot be established in a vacuum but is influenced by gradients of cost effectiveness and workload as well as norms at the work place, that push work activities towards the boundary of unsafe work performance (with the risks of accidents or other unwanted incidents). Young workers in the three trades experience the cost gradient in varying degrees, e.g., in terms of the time allocated to the task they are given. This seems to be most pronounced in the retail trade, where simple safety precautions are ignored, as in the case with the lifting of heavy fruits boxes and no use of a trolley, which must ensure that the goods are placed on the shelves in an ergonomically correct way. The young workers in the present study experience the least efforts gradient, e.g., in terms of not using the ventilation system or not wearing glasses when using the dentist-grinder. Unlike Rasmussen, we found that the mechanism behind this least effort gradient is not necessarily based on a need on the part of the young workers to reduce their efforts, but rather seems to be a practice that they become part of and which entails 'corner cutting' of safety practices.

When a rather strong cost gradient and effort gradients drive the activities, Rasmussen (1997) suggests that the result very likely will be a systematic migration toward the boundary of functionally acceptable safety performance and, which might compromise safety and accidents may occur (Cook and Rasmussen, 2005; Rasmussen, 1997). This in particular applies, when the counter gradient, in terms of adequate safety precautions, are very weak or absent. The present study shows, that in many cases it is left to the young workers to make the trade-off

between the efforts gradient and cost gradient, and then the counter gradient, i.e., the safety precautions, are transferred to the young workers, particularly in the retail sector. This means that new young workers become participants in a social practice in which relatively strong norms are driving them to the border of safe work activities, without there being adequate mechanisms to ensure the 'safe space'.

#### 4.1. Improving safety learning

The results show that often new young workers are getting information about health and safety or they attend courses. This happens at times before they start the work, at times after. However, the information they get is overturned, filtered through sensations of insecurity that result from their awareness as newcomers. When young new workers are assigned a task that may seem simple to the experienced worker, this task may seem complex from the point of view of the new young worker. In varying degrees, the results points to young workers that are left to decide for themselves how to balance different 'gradients' and thus driving them to the border of safe work activities, without there being an adequate 'counter gradient' (read, safety precautions or support from colleagues) to ensure a safe working environment for the young workers. Also, it has been shown how varying forms of employment forms and differences in experiences in young workers impact on learning possibilities. Unskilled workers tended to get less information and training, while at the same time they were expected to fast track their learning. This can negatively impact on safety of unskilled young workers and efforts to improve new young workers' safety could most likely benefit from extending the apprentice-like induction practices to unskilled new workers as well.

Based on these results we argue, that to improve safety learning coping skills at the boundaries of safe practice should be strengthened (Rasmussen, 1997). The move towards the boundaries of safe practice does not happen only because they lack information, but because they lack relational learning stretched out in time. It is evident that knowledge of risks is not enough to ensure the 'safe space'. Why are heavy fruit boxes handled without the consideration of the norm of taking care of ones back, norms that are based on information about ergonomics? It appears that a decoupling between cognition and doing take place. Safety learning therefore is not only a cognitive endeavour that depends on intentionality or a change of attitudes, but also something that the workplaces has to engage in collectively. Enhancing the relational aspects between co-workers (new and experienced) potentially can make the space for safe work practices clearer and potentially easier to maintain. Even though professional norms and standards vary across the retail, metal work, and elderly care sectors, and that participants' positions in the workplace vary considerably, the strengthening of organisational practices of debate and reflection will most likely benefit them all.

It is worth mentioning that it may be a limitation that our data only covers three different industries and a limited number of young employees and their immediate superiors and managers, but for a qualitative study this is also the strength, as it makes detailed comparisons possible. It may however be relevant to investigate further whether our results also apply to other sectors. There may be sectors and employment forms in which safety learning will be different from what we have found. For example, research has shown, that it is difficult to protect young workers with the use of traditional instruments in the online Platform Economy (Garben, 2017; More, 2018). Since deregulation and de-collectivisation are some of the crucial features of the digital labour market we expect that safety learning will take new shapes within these forms of work (Nielsen et al., 2019b). Our material also differs for the type of work and risks on which both Vaughan (2004) and Rasmussen (1997) base their theorizations, as we have been investigating occupations with frequent but less serious work accidents. However, as the focus of the present study is not the types of accidents as such, but the organizational processes, we find that the theoretical approaches can be

usefully transferred to the settings in the present study.

## 5. Conclusion

The results challenge the existing understanding of the mechanisms that are important for safety learning. Safety induction is not a linear process of learning that is set of by the organisation first giving information to new workers on how to behave according to professional safety standards, and then prevent them from drifting away from these standards and norms. Rather, these two organisational processes are staggered in time and part of experiential learning in young employees. Safety learning includes not only receiving information about safety and risks at work, but also includes a practice of being inducted to existing deviant practices that have become normalised. Young newly employed workers are offered very different positions from which they can participate and debate risk- and safety issues at the workplaces. Especially for unskilled workers, the induction practises leave little room for learning to work safe as they are expected to work as full participants almost from the start. Therefore, efforts to improve safety for young workers needs to take into account that new employees learn safety by participating in the already existing practices in the workplace, but that the positions from which they take part should be reflected in the support they get. Without being trained through debating and discussing the canons and practical application of correct practice, further reduction of risks and thereby injuries at work are difficult to achieve. Induction practices should not just be seen as an attempt to improve the safety of young workers, but rather as a possibility to improve organisational safety learning at the workplaces as a whole.

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