

# Learning in the Auditing Profession: A Framework and Future Directions

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This version: November 2023

We thank Ken Trotman (editor), Jeremy Bentley, Kyle Broderick, Eddy Cardinaels, Anna Gold, Eriko Kameoka, Mark Nelson, and two anonymous reviewers for helpful comments and suggestions on prior drafts, and Paige Csere for her valuable research assistance. The authors gratefully acknowledge the financial support of the Foundation for Auditing Research (Project 2020B03).

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### **Abstract**

Drawing on literature in auditing and workplace learning, this paper develops the Auditor Learning Framework. The Auditor Learning Framework distinguishes auditor learning processes along two dimensions: the location of learning (on-the-engagement or off-the-engagement) and the role of the others in the learning process (active or passive). We review the auditing literature and classify papers that directly or indirectly enhance our knowledge of auditor workplace learning into our framework to identify gaps in our understanding of the auditor learning processes. Our study provides a comprehensive view of auditor learning processes and provides suggestions for future research.

**Keywords:** Auditing, workplace learning, expertise development, cognition, auditor expertise

**JEL Classifications:** M42, M53, D83

## 1. Introduction

Auditing is a knowledge-intensive industry, and learning plays a central role in auditing. Because auditors apply a spectrum of business, accounting, auditing, and regulatory knowledge to a client's financial reports, auditors must develop and maintain a considerable body of knowledge to establish their legitimacy and uphold their public responsibilities (Westermann, Bedard, & Earley 2015). Moreover, audit methodologies, processes, and technologies constantly change, implying that it is pivotal for auditors to continuously update their knowledge and skill set to meet the ever-evolving demands in the workplace (Kusaila 2019).

While formalized education is vital for establishing an auditor's foundational knowledge, standard-setters and regulators argue that continual learning is critical for audit quality (e.g., IAASB 2014; ICAS & FRC 2016; PCAOB 2002, AS 1010). Consistent with the need for continual updating of knowledge, auditors indicate that most of their learning occurs in the workplace (Daoust & Malsch 2019; Hicks, Bagg, Doyle, & Young 2007; Westermann *et al.* 2015). Workplace learning is defined as “[c]hanges in behavior and knowledge based on activities and programs experienced in the workplace” (Cranton 2013).

Despite its significance, auditing research has focused little direct attention on workplace learning. Nonetheless, existing research provides insight into workplace learning as a by-product of studying other auditing processes, such as interactions with clients, the audit review process, and performance evaluations. Because auditing studies rarely directly discuss workplace learning, it can be difficult to extract and integrate the relevant insights. This lack of integration hampers auditing researchers' ability to build on each other's work and increases the probability that practitioners and regulators make decisions about auditor workplace learning in the absence of valuable academic evidence. Our study addresses this research gap.

The first purpose of this paper is to facilitate integration of existing evidence by providing structure to our understanding of auditor learning processes. We adapt Jacobs and Park's (2009) general workplace learning framework to develop the Auditor Learning Framework (ALF). We use the ALF to classify existing research that provides insights into auditors' learning processes along two dimensions: the location of learning and the role of others in learning. The first dimension reflects whether learning takes place on or off the audit engagement (i.e., the location of learning). On-the-engagement learning occurs while auditors are conducting their primary work tasks and learning is therefore likely to be incidental to other work tasks (Eraut 2007). The typical environment of the audit engagement includes features that likely impede workplace learning. These include, yet are not limited to, stress and time pressure (DeZoort & Lord 1997), high workload (Christensen, Newton, & Wilkins 2021), an inherent cost-quality conflict (McNair 1991), limited and indirect feedback about errors (Grohnert 2017; Grohnert, Gijsselaers, Meuwissen, & Trotman 2023; Shanteau 1992; Van Mourik, Grohnert, & Gold 2023), and lack of room for innovation (Power 1997). All these features likely make learning on the audit engagement more challenging.<sup>1</sup>

Off-the-engagement learning takes place outside of the primary job tasks, where there is typically lower stress, workload, and time pressure, as well as the potential for more valid feedback and room for innovation. Off-the-engagement environments, however, may be less engaging as auditors are not directly experiencing consequential work tasks and outcomes. These differences

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<sup>1</sup> Other professions, such as medicine, share an overlapping set of features. A distinguishing feature is the ability to learn from errors. For example, physicians often receive immediate feedback on their decisions, especially in emergency settings. Auditors rarely witness the implications of their assessments, with feedback coming much later after a review, in subsequent audit cycles, or not at all (e.g., Grohnert 2017).

across learning environments are likely to influence how different types of knowledge are best acquired and what interventions best foster learning.

Auditors can learn from a variety of others, including multiple trainers, supervisors, peers, and clients. This variety is likely greater than in many other professions because auditors work in teams that change over time and on multiple engagement teams simultaneously. The second dimension in our framework concerns whether these others take an active or passive role in the auditor's learning process (i.e., the role of others). Active or passive involvement by others is likely to affect how learning takes place. For instance, when others have an active role there may be more opportunities to learn explicitly from others through guidance, feedback, and support. However, when others have a passive role, the learner may need to take initiative to seek out information and resources on their own, requiring more self-motivation and self-direction from the learner.

The second purpose of this paper is to synthesize existing research on auditor learning to facilitate and guide future research. To this end, we take a broad view of learning, incorporating prior research that directly examines learning processes, as well as research that indirectly shows improvements in auditors' knowledge and job performance because of activities and programs in the workplace. For each learning process, we start, where possible, by characterizing the learning process based on the more general workplace learning literature. Next, we review the auditing literature and incorporate auditing research that examines auditor workplace learning. Juxtaposing the more general workplace literature and the relevant auditing literature while considering special circumstances in auditing allows us to identify opportunities for future auditing research.

We highlight four important insights and future directions that emerge from our work. First, the literature shows that when auditors learn on the engagement, learning tends to be complicated by the dynamic stimuli and difficulties in obtaining precise feedback and identifying errors. To

compensate for the lack of clarity about relationships, reflection can be a useful tool to help translate concrete experiences into abstract conceptualizations. However, environmental factors such as time constraints and high workload can limit opportunities for reflection. Therefore, to foster workplace learning, we suggest that audit firms develop interventions to create reflective moments for auditors during audit engagements. In contrast, off-the-engagement learning processes, such as training, tend to offer greater environmental validity and more time for auditors to reflect. In these off-the-engagement learning processes, audit firms can provide auditors with specific knowledge structures or train them to self-reflect. This can facilitate the mapping of concrete experiences into abstract conceptualizations, thereby reinforcing workplace learning (Bonner, Libby, & Nelson, 1997; Borthick, Curtis, & Sriram, 2006).

Second, the involvement of others in the learning process determines how learning takes place and what factors play a role. Especially when others have an active role in the learning process, the literature highlights the significance of the relationship quality between auditors and others (i.e., from those they learn from) as a crucial factor in learning from others. However, strong relationships are not always better for learning. For example, overly intensive informal mentorship can cause role stress (Viator, 2001), familiarity drives differences in the effectiveness of various types of feedback (Harding & Trotman, 2009), and strong social bonds may encourage openness to contrasting advice but may hinder evaluation of advice quality (Kadous, Leiby, & Peecher 2013). To facilitate learning, auditors, audit teams, and audit firms can adopt a customized approach to learning based on the learning process and the relationship strength.

Third, there is an opportunity for the auditing literature to delve deeper into the interplay of auditor learning processes. The extant literature highlights distinct auditor learning processes, but workplace learning processes in our framework likely are interconnected. For instance, when

auditors conduct tasks during audit engagements, they may learn from experience. However, this learning may be unconscious and tenuous. When the same tasks are highlighted in the audit review or during a training, others can convey general rules and fit the experience into those rules, solidifying the learning. Other potential interactions include, yet are not limited to, the role of performance evaluations in providing additional learning opportunities and resources to auditors, how materials learned off the engagement can be transferred to the audit engagement, as well as the value in auditors consulting others when following through on review comments. Better knowledge of potential interactions among auditor learning processes can help researchers and audit firms to develop a more coherent approach towards auditor learning.

Fourth, the literature demonstrates that automation and outsourcing of audit tasks have altered the roles of auditors, particularly those of junior auditors (e.g., Bennett & Hatfield 2018; Bol, Estep, Moers, & Peecher 2018; Zhang, Thomas, & Vasarhelyi 2022). As a result, auditors must conduct higher-level thinking tasks and interact with clients earlier in their career, suggesting that what needs to be learned and when it needs to be learned change over time. It may be that different learning processes are needed at different stages compared to a decade ago. For example, mentoring may be needed earlier in the auditor's career and learning error frequency knowledge may become less important to audit quality given the developments in technological tools. This implies that it may be valuable to replicate prior literature and reexamine whether results remain valid in the current auditing profession, particularly when there are theoretical or a priori grounds indicating that certain relationships may have changed. Additional areas of change include the impact of remote working (Bauer, Humphreys, & Trotman 2022) and changing perceptions towards work among younger generations in the workforce (Westermann *et al.* 2015) on job performance.

The remainder of this paper proceeds as follows: Section 2 presents the Auditor Learning Framework. Section 3 presents the research method and sample description. In Sections 4 and 5, we review literature and provide future research directions for off-the-engagement learning processes and the on-the-engagement learning processes, respectively. In Sections 4 and 5, we further distinguish between learning processes in which others have an active versus passive role. Section 6 concludes.

## **2. The Auditor Learning Framework**

We develop the Auditor Learning Framework (ALF) to structure and synthesize the auditing literature on workplace learning. Our framework helps to identify results and insights in the auditing literature that are relevant for auditor learning and sheds light on the different ways in which learning takes place in the auditing profession. Clearly structuring learning processes facilitates developing a cohesive understanding of workplace learning (e.g., Clarke 2005; Colley, Hodgkinson, & Malcom 2003; Jacobs & Park 2009). For example, researchers can more effectively build on existing knowledge if they understand the various ways learning occurs in auditing and the implications of those processes. Likewise, audit firms and policymakers can improve auditor workplace learning if they understand how the learning processes impact the learning context and the likely success of various interventions. Figure 1 displays the Auditor Learning Framework.

*[Insert Figure 1 here]*

The ALF distinguishes learning processes based on two dimensions highlighted by Jacobs and Park (2009). First, the *location of learning* can vary as off-the-engagement and on-the-



engagement. Second, the *role of others* (i.e., a trainer, facilitator, etc.) in the learning process can be either active or passive (e.g., Sambrook 2005).<sup>2</sup> We discuss the two dimensions sequentially.

Auditors' primary role consists of working on audit tasks for client engagements. In off-the-engagement learning, learning is separate from these tasks, whereas on-the-engagement learning refers to workplace learning that occurs while performing tasks for client engagements (Eraut 2007). The location of learning (either off or on the engagement) thus determines the context in which learning occurs and whether learning is a core goal or a by-product of the activity (e.g., Sambrook 2005). More specifically, because off-the-engagement learning occurs separately from work tasks (i) it is typically more formal (Jacobs & Park 2009), (ii) it is typically more intentionally designed, (iii) learners tend to use a more deliberative mode of cognition, (iv) there is more time to reflect (Colley *et al.* 2003; Eraut 2007), and (v) environmental conditions are such that patterns are more clearly observable (i.e., environmental validity is higher) (Grohnert 2017). This type of learning may be focused on developing knowledge and skills that can be applied across different audit engagements (Eraut 2007). In contrast, on-the-engagement learning occurs while work tasks are being performed. It thus (i) is typically more informal, (ii) is often a by-product of working, (iii) involves learners using a more intuitive mode of cognition (e.g., Eraut 2007; Sambrook 2005), (iv) often occurs in a time-constrained, high-pressure context, and (v) takes place with lower

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<sup>2</sup> Our dimensions differ from those of Jacobs and Park (2009) in at least two ways. First, we use the labels “on the engagement” and “off the engagement”, whereas they use “on the job” and “off the job.” Our labels reflect that most learning in auditing occurs in the workplace and there is little research addressing how auditors learn outside the workplace (Eraut 2007; Hicks *et al.* 2007). Our labels also reflect important differences in the learning environment in on versus off the engagement learning. Second, Jacobs and Park (2009) refer to an active role of a trainer/facilitator, whereas we refer to an active role of others. There are more actors who play an active role in workplace learning in auditing. Third, Jacobs and Park (2009) have a third “extent of planning” dimension, which captures the extent to which the assessment, analysis, design, development, implementation, or evaluation of workplace learning is structured. We exclude this dimension because the extent of learning structure in auditing varies across firms and is difficult to observe. For example, mentoring may be implemented with more or less structure. We expect that only learning from performance evaluation and learning from training are uniformly highly structured.

environmental validity. As the focus is on working instead of learning, on-the-engagement learning is often highly contextual and may be driven by the specific needs of the engagement (Eraut 2000; 2007).

The role of others in auditor learning can either be active or passive. When others take an active role, they directly and proactively intervene in the learning process. For instance, others may function as trainer, guide, or facilitator during the learning process. In contrast, learning may also occur without an active involvement of others. For instance, this occurs when others take passive roles that impart learning as a by-product of conducting some other tasks. For example, auditors can learn from client interactions even though the client is primarily focused on providing the auditors with audit evidence and answers to their inquiries (Eraut 2007; Guénin-Paracini, Malsch, & Tremblay 2015). When others have a passive role, the learning is likely to be more self-directed, less intentional, and less deliberate. As auditing is often characterized as an apprenticeship, both active and passive roles of others in learning processes are important (e.g., Anderson-Gough, Grey, & Robson 1998; Westermann *et al.* 2015).

The two dimensions of the framework lead to four quadrants, as shown in Figure 1. Learning is likely to take place differently in each quadrant. Based on the more general workplace learning framework by Jacobs and Park (2009) and an initial scan of the auditing literature, we identify nine learning processes within these four quadrants.

### **3. Methodology and Sample Description**

Using the Auditor Learning Framework, we review and categorize existing auditing literature relevant to nine learning processes, synthesizing findings and identifying gaps and opportunities that can lead to future research. In line with our definition of workplace learning as “[c]hanges in behavior and knowledge based on activities and programs experienced in the

*workplace*” (Cranton 2013), we take a broad view of learning in selecting papers for our literature review. Our broad view is consistent with the idea that workplace learning is the most inclusive term to describe the many ways that employees learn in organizations (Jacobs & Park 2009).

Our procedures are shown in Figure 2. We review studies from six top general accounting journals and the leading field journal in auditing using relevant keyword searches in journal databases.<sup>3</sup> Within the journal databases, we search for mention of “audit\*” in the abstract and “learn\*” in the text. We develop keywords (e.g., experience, clients) based on the learning processes in the ALF. We further require that the keyword appears in the abstract of the paper. Our literature search includes papers published from January 1980 through April 2023. These identification criteria led to the identification of 812 papers.

This search included irrelevant hits, so we applied additional inclusion criteria. First, some of the keywords can be used in ways that are not aligned with our definition of learning (e.g., “we *learn* from analysis X that...” or “participants *learned* that...”). We used our judgment to eliminate irrelevant papers. Second, as we are interested in how individual auditors learn, we ensured that either individual auditors are the object of interest in the study, or the study draws clear implications for individual auditors. Third, in line with our definition of workplace learning, we required that changes in individual knowledge or behavior be documented or implied by the study. Fourth, also in line with our workplace learning definition, these changes in individual knowledge or behavior should be due to activities and programs experienced in the workplace. Fifth, the studies included must be original empirical studies, rather than reviews or meta-analyses (e.g., Machi & McEvoy 2021). These criteria led us to include 89 of the 812 records (10.96 percent). To

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<sup>3</sup> The journals are Accounting, Organizations, and Society (AOS), Auditing: A Journal of Practice and Theory (AJPT), Contemporary Accounting Research (CAR), Journal of Accounting and Economics (JAE), Journal of Accounting Research (JAR), the Review of Accounting Studies (RAST), and The Accounting Review (TAR).

ensure we did not miss relevant articles, we used the snowball method and reviewed discussions of prior literature and reference lists in covered papers (e.g., Tynjälä 2013). For papers that appeared relevant, we used the inclusion criteria listed above. This process yielded 26 additional papers for our literature review. In total, the literature review includes 115 papers. The avenues for future research that emerge out of our literature review are stated in Table 1.

*[Insert Figure 2 here]*

[Insert Table 1 around here]

#### **4. Off-the-Engagement Learning**

Auditor learning processes that take place outside the audit engagement explicitly focus on auditor learning or development (Eraut 2007). Learning off the engagement is thus typically more deliberate than learning on the engagement. We identify four learning processes. Three of these processes, learning from performance evaluation, learning from training, and learning from mentoring, tend to occur with others taking an active role in the auditor's learning. A fourth learning process, learning from socialization, typically involves a more passive role of others in the auditor's learning.

##### **4.1. OFF-THE-ENGAGEMENT LEARNING PROCESSES WHERE OTHERS HAVE AN ACTIVE ROLE**

###### **4.1.1. Learning from performance evaluation**

Performance evaluation is the process of assessing an individual's job-related performance and providing feedback on their strengths and areas for improvement. Learning from performance evaluation has been extensively studied in prior literature outside of auditing. That is, prior literature outside of auditing identifies at least two ways in which performance evaluation can lead to better learning outcomes. First, performance evaluations directly convey strengths and weaknesses in an individual's actions, behaviors, and performance, thus providing feedback about

whether certain actions and behaviors in the workplace are likely to prove effective (DeNisi & Smith 2014; Kluger & DeNisi 1996). Second, performance evaluations can provide an indirect way of learning if they are used to allocate training resources, such as leadership training and mentoring, to employees. Performance evaluations can thus be used to augment the value of other learning processes, including training.

For effective learning, performance evaluations should be specific, timely, and actionable, and they should cover both strengths and areas for improvement (Hattie & Timperley 2007). Furthermore, the effectiveness of performance evaluations is positively associated with individual factors, such as the individual's motivation to learn, tendency to self-reflect (Boud, Keogh, & Walker 2013; Daudelin 1996), and application of a growth mindset (Dweck 2006; Grant & Dweck 2003). Finally, the effectiveness of learning from performance evaluations also depends on the nature of the task and the type and the quality of feedback (e.g., Hattie & Timperley 2007).

Auditing research on learning from performance evaluations primarily considers the performance dimensions evaluated (e.g., tacit managerial knowledge versus technical accounting and auditing knowledge), the type of feedback provided (e.g., outcome versus procedural), and the accuracy of performance evaluation information. We review studies in each of these areas below. While prior research outside of auditing suggests that individual factors are important to learning from performance evaluations (e.g., Boud *et al.* 2013), there is not much auditing research that highlights individual factors. One notable exception identifies the evaluatee's receptiveness towards feedback as helpful in specific circumstances, as described below (Andiola & Bedard 2018). Table 2 provides an overview of this literature.

*[Insert Table 2 here]*

*Performance dimensions evaluated*

A key question is what dimensions of performance are valued by firms and incorporated into performance evaluations (Kida 1984; Wright 1982). Tan and Libby (1997) identified that for high-ranking auditors, better tacit managerial knowledge leads to higher performance evaluations, while for low-ranking auditors, only technical knowledge matters. However, Bol *et al.* (2018) noted a shift, arguing that firms increasingly value tacit knowledge in junior auditors due to their evolving job roles as many structured tasks previously performed by junior auditors have been automated or outsourced. Contrasting Tan and Libby (1997) and Bol *et al.* (2018) highlights how the importance of different types of knowledge can vary over time.

### *Type of feedback*

The effectiveness of different types of feedback for learning depends on task types and interpersonal aspects. Outcome feedback is less effective for configural tasks (i.e., those in which relationships among stimuli need to be considered for high-quality judgment), while feedback on the optimal policy to complete a task improves performance for both types configural and non-configural tasks (Leung & Trotman 2005).<sup>4</sup> Individual-specific outcome feedback is most effective when familiarity with the evaluatee is high, as it reduces overconfidence. In contrast, group-level outcome feedback performance most when familiarity with the evaluatee is low (Harding & Trotman 2009).

The valence of feedback influences its learning value. Negative feedback affects job performance positively only if the criticism is aimed at specific aspects of the work rather than at the auditor's personal characteristics (Kida 1984). However, negative feedback can also lead to worse attitudes towards the coaching relationship and increased efforts to manage impressions—

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<sup>4</sup> Cognitive feedback, which focuses on the judgment policy used, and combined task properties/cognitive feedback are more effective in configural than in non-configural tasks.

both of which can interfere with learning—unless the reviewer frames the review with learning goals and the subordinate is more receptive towards feedback (Andiola & Bedard 2018).

#### *Accuracy of performance evaluations*

Inaccuracies in performance ratings arise due to evaluator overconfidence. Auditors tend to be overconfident in assessing their own abilities (Kennedy & Peecher 1997). Because overconfident auditors tend to anchor on their assessments of their own knowledge when assessing subordinates' knowledge, these assessments tend to be inflated (e.g., Jamal & Tan 2001; Kennedy & Peecher 1997; Tan & Jamal 2001). This process leads to overconfidence in others' knowledge that is increasing in the size of the knowledge gap between the evaluator and evaluatee. Moreover, assessment errors differ for familiar versus unfamiliar evaluators and evaluatees (Harding & Trotman 2009). Overall, evaluators' overconfidence in others' knowledge can undermine learning indirectly by causing auditors to be assigned tasks for which they are underqualified, to receive less supervision than needed, and to have their work reviewed less closely than appropriate.

#### *Avenues for future research*

Performance evaluations have received relatively little attention from auditing researchers (see also Andiola 2014). In terms of the assessment component of performance evaluations, we still know little about the performance dimensions being captured. While professional skills, such as professional skepticism, auditor independence, and professional identity, are increasingly important in the current audit environment, it is unknown as to what extent and how they are evaluated (Bol *et al.* 2018; Westermann *et al.* 2015). Future research could investigate whether these dimensions captured and the weights assigned to them are appropriate for advancing auditor learning. Finally, researchers can explore how the performance evaluation process can be improved to assess auditors' skills and abilities more accurately.

In terms of the feedback component of performance evaluation, there is limited audit research on how feedback type influences learning. Audit partners and regulators have expressed concerns that feedback is ineffective because auditors are either unable or unwilling to provide negative comments to junior colleagues (PCAOB 2010a; Westermann *et al.* 2015). However, research also indicates perils involved in providing negative feedback. The optimal type of feedback likely also interacts with or depends on other task and environmental variables. Except for Andiola and Bedard (2018), no recent study has examined how individual factors, such as auditors' motivation to learn, ability to self-reflect, and growth mindset, affect auditor learning from performance evaluations. Finally, whereas research indicates that performance evaluations have both direct and indirect impacts on learning, auditing research has not yet examined the indirect path. That is, whether and how performance evaluations can be used to allocate training, mentoring, or other resources to auditors to facilitate learning. Panel A of Table 1 reports research questions related to learning from performance evaluation.

#### **4.1.2. Learning from training**

Employee training programs impact workplace learning by providing opportunities to acquire new knowledge, skills, and behaviors that can improve their job performance. Training programs also contribute to the development of a learning culture within organizations, wherein employees are encouraged to continually learn and apply new knowledge and skills on the job (e.g., Marquardt 2002). Research outside of auditing shows that effective training programs can improve job performance, motivation, and satisfaction (e.g., Saks & Belcourt 2006). Several factors influence the effectiveness of training programs. One important factor is the design of the training program, including the incorporation of learning principles, sequencing of training material, and job relevance of the training content (Baldwin & Ford 1988). Delivery format,



whether web-based, action learning, or classroom training, also impacts the effectiveness of training (e.g., Sitzmann, Kraiger, Stewart, & Wisher 2006). For instance, Sitzmann *et al.* (2006) find that web-based learning is more effective for declarative but not for procedural knowledge. Finally, several factors, including trainee characteristics (e.g., ability, skill, motivation, and personality), training design (e.g., opportunities for practice), and work environment (e.g., social support), affect the transfer of training to the workplace, which is important for the benefits of training to materialize (Baldwin & Ford 1988; Blume, Ford, Baldwin, & Huang 2010).

Audit firms provide extensive training programs to their employees (e.g., Deloitte 2019). Yet, audit partners raise concerns that training for new hires has shortened and lacks practical application (Westermann *et al.* 2015). Training programs, which mainly focus on learning, rather than working, are structured and discrete events during which auditors are taught how to conduct specific tasks. Trainers take an active role in guiding learners. As a result, auditors learn more deliberately from training than they do when learning on the engagement (Eraut 2007).

We identify six papers that examine training in the audit environment. These papers focus mostly on training design. We do not find papers that examine the relationship between characteristics of the trainee or the work environment and training effectiveness. Table 3 provides an overview of studies related to learning from training.

[Insert Table 3 here]

### *Training Design*

Auditing studies highlight the role of appropriate training design to effectively transfer learning from training to the workplace (e.g., Blume *et al.* 2010). Four papers in this area investigate how interventions can improve learning gains from training in auditing. They find that explanatory feedback is necessary for auditors to acquire procedural knowledge from training

(Bonner & Walker 1994). Outcome feedback only provides a good substitute for explanatory feedback to acquire procedural knowledge when the feedback is combined with instruction on understanding rules. Further, the combination of explanatory feedback and self-explanation leads to more learning than either alone (Earley 2001). Instruction can impart category knowledge to inexperienced auditors (Bonner *et al.* 1997), and specific instruction about knowledge structures can be helpful in improving judgments of inexperienced auditors (Borthick *et al.* 2006).

Two additional studies examine the effectiveness of different combinations of training techniques. Self-explanation, which requires auditors to explain the reasoning behind their judgments, enhances the effectiveness of both worked-out examples and learning from problem solving (Moreno, Bhattacharjee, & Brandon 2007). Moreover, training auditors in divergent thinking improves auditor performance in designing analytical procedures over that of a control group, while training them in both divergent and convergent thinking improves performance over training them in divergent thinking alone (Plumlee, Rixom, & Rosman 2015), suggesting that both processes contribute to learning. Together, these studies show that appropriate knowledge structures can be provided to novice auditors through instruction, and they provide information about how training can be designed to help novice auditors use these knowledge structures when needed. A recurring theme is that explanatory feedback and self-explanation are key for auditors to learn to apply the structures.

#### *Avenues for future research*

While auditing research on training has focused exclusively on aspects of the design of training, many questions about how auditors learn from training remain unanswered. For instance, research has not identified whether and how other types of knowledge and skills, such as tacit managerial knowledge, professional skepticism, and ethicality are best learned in training. These

professional skills may benefit less from conventional training methods and more from role-playing or other perspective-taking exercises. In addition, while some research outside of auditing has investigated the relative effectiveness of different training delivery formats (e.g., Sitzmann *et al.* 2006), new research is needed given that training programs in general and web-based training in particular are very different compared to 20 years ago. Future research could consider the effectiveness of different delivery formats for auditor training programs and whether the effectiveness of these methods varies for learning different types of knowledge.

Importantly, while prior auditing research shows that learning benefits from thoughtful combinations of training elements and methods, it is also likely that learning benefits from thoughtful combinations of training and other learning processes, including on-the-engagement methods. Research can examine how to best sequence training and experiences, for example, to increase learning. Finally, training is only useful to the extent that lessons learned off the engagement transfer to the audit engagement. Future research could investigate factors that facilitate and hinder the transfer of training to the workplace. Such factors might include auditor characteristics, training design, and the validity of feedback in the auditing environment. Panel B of Table 1 reports research questions related to learning from training.

#### **4.1.3. Learning from mentoring**

Mentoring is a process of transferring knowledge and skills from an experienced professional to a less experienced one. Mentoring is positively associated with job performance, job satisfaction, and career advancement across several workplace settings (for a meta-analysis, see Eby, Allen, Evans, Ng, & DuBois 2008). However, the effectiveness of mentoring programs depends on a range of factors, such as the quality of the mentor-mentee relationship (Allen,

Shockley, & Poteat 2010), the mentor's experience and expertise (Scandura & Ragins 1993), and the level of support and resources provided by the organization (Kram 1985).

Within audit firms, mentoring facilitates socialization and learning (Dirsmith & Covaleski 1985; Scandura & Viator 1994). Its primary goals are to instruct auditors on the politics and power dynamics within the firm and to socialize them into the profession (Scandura & Viator 1994). By doing so, mentoring in audit firms helps to establish control, develop careers, and provide social support. Mentoring enables the protégé to learn vicariously from the mentor's experience, to acquire new skills, and to enhance their job performance. While mentoring can occur on-the-engagement, it typically occurs off-the-engagement and involves an active role for the mentor. We identify five papers that investigate the effectiveness of mentoring in audit firms. These papers describe mentoring in audit firms, examine the relative value of formal and informal mentoring, and examine the termination of mentoring relationships. Table 4 lists these papers.

*[Insert Table 4 here]*

Mentoring in auditing benefits the protégé, the mentor, and the firm. Mentoring is highly effective for establishing control in audit firms—even more so than bureaucratic and rules-oriented methods (Dirsmith & Covaleski 1985). Mentoring relationships form at boundaries in the audit hierarchy, and the mentoring process typically evolves as an auditor progresses through the ranks from explanation and learning about audit tasks at more junior levels to learning about managing a career and power politics at higher levels. Mentoring in auditing can be viewed as consisting of three separate functions: career development, role modeling, and social support (Scandura & Viator 1994). In terms of support, mentoring reduces role stress, increases job performance, and reduces turnover intentions (Viator 2001). Formal mentoring is often ineffective, while informal mentoring increases workplace learning by improving job performance and reducing turnover

intentions (Viator 2001). However, if informal mentoring becomes too intensive, role conflict can result, bringing negative ramifications for learning (Viator 2001).

Mentoring relationships can add value even after their termination. Sometimes auditors are structurally separated from their mentors after the formal mentoring relationship is terminated, and the separation can improve learning opportunities (Viator & Pasewark 2005). In addition, the mentoring culture at audit firms typically allows ex-auditors to remain in contact with their former colleagues for advice and professional opinions, suggesting that mentoring and its related benefits may continue outside the audit firm (Daoust & Malsch 2019).

#### *Avenues for future research*

As informal mentoring can lead to role stress, future research can investigate the consequences of this role stress for learning and examine how any negative consequences can be mitigated. Moreover, informal mentoring is more difficult for the firm to monitor, and inequities may develop and worsen if auditors in groups underrepresented in the higher ranks find it difficult to find appropriate mentors. Research can examine how informal mentoring can be fairly provided or how to balance aspects of formal and informal mentoring to improve learning outcomes.

While research outside auditing examines factors other than the formality of mentoring that influences its effectiveness, these factors are largely unexplored in auditing. Research could examine which mentor skills, experiences, and resources provided by the audit firm are most important to effective mentoring, as well as whether mentor-mentee matches on background or personality attributes facilitate effective mentoring. Finally, despite some research into termination of mentoring relationships, it remains unclear at what stage in an auditing career mentor separation or rotation ideally occurs and what mentoring roles are most effective in stimulating learning. Panel C of Table 1 lists research questions related to learning from mentoring.

## 4.2. OFF-THE-ENGAGEMENT LEARNING PROCESSES WHERE OTHERS HAVE A PASSIVE ROLE

### 4.2.1. Learning from socialization

Socialization is the process of learning to behave in a particular group or setting. The socialization process can be influenced by a variety of factors, including the culture of the organization (e.g., the degree of conformity expected), characteristics of the individual employee (e.g., personality traits), and the nature of the job (e.g., complexity and degree of autonomy) (Bauer, Bodner, Erdogan, Truxillo, & Tucker 2007; Van Maanen & Schein 1979).

The process of socialization in auditing involves role acquisition.<sup>5</sup> Role acquisition involves learning the norms, values, and behaviors that are expected of an auditor in their professional contexts (Anderson-Gough, Grey, & Robson 2001; Grey 1998; Power 2003). Studies on auditor socialization highlight the importance of learning how to be a member of the auditing profession and the audit firm (Grey 1998; McNair 1991). Because socialization has different goals and results across the strict hierarchy that characterizes audit firms, it is important to analyze socialization with the different levels of hierarchy in mind. Table 5 displays the covered studies.

*[Insert Table 5 here]*

When auditors begin their employment at the staff level, socialization centers on identity formation (Anderson-Gough, Grey, & Robson 2005; Grey 1998). In this early stage of socialization, time-consciousness, temporal visioning of one's future career, and managing cost-quality conflicts are fundamental to securing and developing professional identity by staff auditors (Anderson-Gough *et al.* 2001; Dirsmith & Covalleski 1985; McNair 1991).

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<sup>5</sup> Learning from socialization is similar to learning from mentoring in that mentors may help auditors socialize into the profession and firm. A distinction is that mentoring generally involves an active role for others (i.e., the mentor), whereas socialization typically occurs without active involvement of others.

The socialization process of managers is relatively understudied compared to that of staff auditors (below managers) and partners (above them). The limited research describes becoming manager as a rite of passage wherein the previous identity is destabilized, and managers need to learn a new set of practices (Kornberger, Justesen, & Mouritsen 2011). In this transition, formal training is less useful and new managers are largely on their own to develop the soft skills needed at this level through trial-and-error. Studies on learning from socialization at the partner level focus on development of the new partner's professional identity (Carter & Spence 2014; Lander, Koene, & Linssen 2013; Spence, Zhu, Endo, & Matsubara 2017). At the partner level, commercialism starts to play a larger role in auditor's identity, while professionalism remains an important force (Lander *et al.* 2013). New partners must navigate the relative focus of commercial versus professional directions in developing their identity (Lander *et al.* 2013; Spence *et al.* 2017).

#### *Avenues for future research*

There is little research on whether audit firms attempt to predict how well an applicant will socialize into the firm, and, if so, whether these predictions are accurate and whether firms acting on them are better off. There is also little research on whether socialization and identity formation begin before joining an audit firm. Future research could explore these issues.

An important area for future research is the role of diversity and cultural factors in learning through socialization processes (e.g., Anderson-Gough *et al.* 2005; Spence *et al.* 2017). Future research could also examine means of improving socialization of underrepresented groups. Open questions also remain about how auditors in various cultures are socialized into the partner role. Finally, it may be useful to revisit what we know about the socialization of staff auditors, as most of these studies are two decades old. Changes in the required skills and knowledge of staff auditors (Bol *et al.* 2018), as well as the fact that part of the socialization process may have shifted to a

virtual environment (Bauer *et al.* 2022), have likely changed the process, its aims, and its effectiveness. Panel D of Table 1 provides research questions related to learning from socialization.

### **5. On-the-Engagement Learning**

The ALF classifies a process as on-the-engagement learning when learning takes place while the auditor is performing work tasks. As a result of being enmeshed with work, learning on the engagement is often incidental and a by-product of working (Eraut 2000; 2007). Auditors perceive the auditing environment to have relatively low environmental validity, which provides challenges for learning (Grohnert 2017). Environmental validity can be described as “the causal and statistical structure of the environment” (Kahneman & Klein 2009, p. 520). In limited validity environments, stimuli are dynamic, conditions change frequently, exceptions are rare, judgments are subjective, and feedback is indirect and limited (Shanteau 1992). Under such conditions, pattern recognition often proves invalid for predicting future cases, making learning particularly challenging (e.g., Grohnert 2017). Limited validity environments also tend to produce the ‘illusion of validity’ in which decision makers trust that situational cues are valid, while in fact they are not (Kahneman & Klein 2009).

In our framework, we define and highlight two types of on-the-engagement learning that involve an active role for others: learning from consultation and learning from audit review. While auditor learning is often not the focus in these processes, the consulted specialists and other auditors, as well as supervisors conducting reviews, are actively conveying feedback and information to the learner (e.g., Hux 2017). We identify three additional processes that occur with more passive involvement of others: learning from experience, learning from client interactions, and learning in teams.



## **5.1. ON-THE-ENGAGEMENT LEARNING PROCESSES WHERE OTHERS HAVE AN ACTIVE ROLE**

### **5.1.1. Learning from consultation**

Individuals can learn from consultation through various methods such as actively asking questions and seeking advice or feedback. The learning potential of any consulting relationship depends on the quality of the relationship and the extent to which the consultant encourages self-reflection and feedback-seeking behavior (Kram & Isabella 1985; Yaniv 2004). Thus, it is essential for individuals to actively participate in consultation and seek feedback to enhance their workplace learning. However, people tend to under-weight advice, even when they know the advisor has superior information (Yaniv 2004). In addition, while individuals sometimes consult others to improve their performance, they also seek advice to manage impressions (Lee 1997). To the extent impression management is the primary goal, learning benefits are likely limited.

In auditing, learning from consultation is important given the complex and often ambiguous nature of audit work. While working on the engagement, auditors can learn directly and indirectly from consultations with specialists, peers, team members, and other auditors (Libby & Luft 1993; Watkins & Cervero 2000). Auditors may learn from consultation through collaboration and knowledge sharing. We first consider learning from formal and informal consultation, then we turn to the more specific case of learning from working with specialists. Table 6 displays the papers examining learning from consultation.

*[Insert Table 6 here]*

#### *Learning from formal and informal consultation*

In an audit firm, consultation involves seeking advice or guidance from individuals or units within the firm. Typically, those consulted possess specialized knowledge or expertise. Consultation represents a common and potentially valuable way for an auditor to learn about complex accounting and auditing issues and to gather new opinions and information about such

issues, potentially increasing audit quality (IAASB 2014; PCAOB 2012). Indeed, auditors consult with each other routinely (Emby & Gibbins 1988). They do so to improve the quality of their judgments and to increase their justifiability (Kennedy, Kleinmuntz, & Peecher 1997).

Consultation may be informal, for instance when consulting about complex transactions or accounting issues (Emby & Gibbins 1988). Knowledge sharing through informal peer consultation improves audit quality and audit efficiency simultaneously (Duh, Knechel, & Lin 2020). Learning from consultation is evidenced when an auditor receives new information or different perspectives and includes this information in current and future judgments. A strong social bond between advice seekers and givers can both help and hinder learning from advice. Auditors heuristically trust advice containing contrary opinions from a close friend (Kadous *et al.* 2013). However, they also rely heavily on such advice without regard to its quality, indicating that the social bond also interferes with calibration.

Many audit firms have *Accounting Consultation Units* (ACUs) that practicing auditors can consult when they are confronted with difficult judgments (Salterio 1994; Salterio & Denham 1997). This represents a more formal type of consultation. A key finding is that when the ACU provides multiple documented examples that are consistent with each other, auditors are likely to follow them; however, if precedents conflict, auditors are likely to adopt client-preferred methods (Salterio 1996; Salterio & Koonce 1997). Overall, evidence suggests that, in both formal and informal consultation, auditors' desire to support a client-preferred position can interfere with learning from advice.

Limited research has studied determinants of auditors' advice-giving. Two properties of advice help advice recipients improve their judgments: contrariness (i.e., the extent to which the information or perspective differs from the advice seeker's) and precision (i.e., specificity)

(Knechel & Leiby 2016). Moreover, active status motives lead advice-givers with higher knowledge to provide less contrary, but more precise, advice (Knechel & Leiby 2016). This indicates boundaries on the value of advice for learning and improving judgment.

### *Learning from engaging specialists*

Research on learning from engaging specialists considers auditors' willingness to engage specialists, cooperation between auditors and specialists, and conditions that influence auditors' willingness to take a specialist's advice. Opportunities to learn from specialists emerge when auditors seek advice from specialists. Such learning is particularly important when auditors lack the requisite knowledge to adequately assess accounting issues, such as in evaluating whether fraud is present and conducting valuations. Willingness to consult fraud experts increases with fraud risk (Asare & Wright 2004). Firms can increase the propensity of their auditors to consult with fraud specialists when fraud risk is high by setting a strict, mandatory, and binding fraud consultation policy (Gold, Knechel, & Wallage 2012). Similarly, auditors are more likely to consult with valuation specialists when estimation uncertainty is higher (implying higher misstatement risk) and when clients also use valuation specialists (Cannon & Bedard 2017). Thus, auditors appear to engage specialists when specialists' expertise is most needed, but circumstances, including firm policy and client actions, also influence whether auditors create opportunities to learn from specialists.

Barriers to cooperation between auditors and specialists can inhibit learning from specialists. First, cooperation among auditors and specialists can be influenced by the quality of the relationship and cross-group struggles for status (Bauer & Estep 2019). For example, third-party specialists may be reluctant to disclose information, preventing auditors from adequately learning about the client models (Griffith, Hammersley, & Kadous 2015). Second, auditors and

specialists may lack a common vocabulary, causing communication problems that potentially hamper learning (Griffith *et al.* 2015). Finally, auditors often use specialists to gain comfort rather than insight, suggesting that auditors are not always trying to learn, but instead seek to support preferred conclusions (Griffith 2020). These studies suggest potential institutional barriers to learning that future research could address.

The potential for learning is increased when auditors are more willing to consider specialist advice. For instance, in high-risk settings a specialist-provided cue (e.g., added commentary that the client model's assumptions are aggressive) improves auditor effectiveness in detecting aggressive reporting, suggesting learning (Griffith 2018). Moreover, while audit firms tend to bemoan the separation between auditors and specialists, this separation can enhance learning from specialists. That is, a weaker versus stronger team identity leads auditors to place more weight on IT specialist input and makes it more likely that auditors differentially weight higher and lower quality input from those specialists (Estep 2021). Finally, a potential positive side effect of engaging specialists is that an auditors' awareness of the availability of a specialist has a social facilitation effect, whereby auditors work harder prior to receiving the specialist's advice (Wright & Bhattacharjee 2018). Hence, specialist-provided cues, a weaker team identity, and the awareness of the availability of a specialist can foster learning from specialists.

#### *Avenues for future research*

Much remains to be learned about the auditor learning from formal and informal consultation. Identification of reasons for auditors' resistance to advice and additional means of increasing auditor receptiveness to advice would be valuable. It appears that one key factor limiting auditors' use of advice is a pro-client bias that pushes them towards client-preferred methods instead of following advice. What we do not know is whether auditors who resist the advice in the

short run nevertheless apply the new knowledge on future engagements. If so, it may be that providing auditors vicarious experiences or utilizing other learning processes may help auditors to learn earlier and avoid risky situations. Rigorous research identifying barriers to learning from advice, as well as conditions and interventions that encourage auditors to learn from advice, are needed.

Finally, two understudied areas are how features of the advice influence the extent to which it is followed and how auditors choose which peers or specialists to consult. On the former point, following Griffith (2020), it may be that certain presentations of advice are more persuasive than others. For example, advice highlighting risks of alternative actions or advice with well-designed visual displays may be particularly persuasive. On the latter point, auditors, like others, may choose advisors whom they expect will tell them what they want to hear, particularly if they are seeking advice to share risk or better justify their conclusions, rather than to learn. Research can examine whether firm guidance about advisor selection or other methods can improve auditors' opportunities to learn from advice. Panel E of Table 1 lists research questions related to learning from consultation.

### **5.1.2. Learning from audit review**

In this section, we focus on a learning process that is unique to the audit environment: audit review. Audit review has two important objectives. First, the audit review serves as a quality control mechanism for the audit—the reviewer aims to detect and correct errors made by the preparer (ASB 2011; PCAOB 2010b; Rich, Solomon, & Trotman 1997). Second, audit review is a venue in which reviewers can coach preparers (Andiola, Brazel, Downey, & Schaefer 2023). Reviewers must balance the short-term need to detect errors, which provides learning opportunities

through task-level feedback, with the long-term need to professionally develop the preparer, which provides learning opportunities through process-level feedback (Andiola *et al.* 2023).

Audit review is an iterative process, with workpapers being reviewed by progressively more experienced auditors, and reviews can be delivered in either written or face-to-face format (Asare & McDaniel 1996; Payne, Ramsay, & Bamber 2010). Typically, a staff auditor prepares a workpaper, and then a senior auditor provides a detailed review and is accountable to a manager, who subsequently provides a more general review (Bamber & Ramsay 1997). The manager, in turn, is accountable for the quality of the entire workpaper to the engagement partner. Audit review provides an opportunity for auditors at different levels to learn about their performance, but they may also learn about auditing procedures, as well as other client- or engagement-related knowledge. Table 7 lists the papers that we cover about learning from audit review.

*[Insert Table 7 here]*

### *Review effectiveness*

Audit review significantly improves judgment accuracy (Trotman 1985) and consensus (Trotman & Yetton 1985) compared to judgments prior to review. Moreover, having experienced the review process increases auditors' performance in a subsequent analytical procedures task (Ismail & Trotman 1995), suggesting that the review process is an effective quality control mechanism. During the process, preparers have incentives to justify their positions and reviewers have incentives to question them (Libby & Trotman 1993), which can lead to discussions that foster learning and improve accuracy. Overall, these documented performance gains following audit review suggests it is an effective learning process for auditors.

Several features of audit review can vary, and this variation influences review and learning effectiveness. First, the review can be executed at several hierarchical levels. The higher the rank

of the reviewer, the more likely they focus on conceptual errors over mechanical errors (Harding & Trotman 1999; Ramsay 1994), suggesting that what can be learned from audit review varies by the rank of the reviewer.<sup>6</sup> Second, if reviewers try to focus on either conceptual or mechanical errors, reviews may be less effective, as reviewers lose their holistic view (Bamber & Ramsay 1997). Third, the audit review can be synchronous and interactive or asynchronous. Generally, the more interactive the review, the more preparers direct effort to more cognitively demanding procedures, feel accountable to the reviewer, and better prepare for potential review questions (Brazel, Agoglia, & Hatfield 2004; Payne *et al.* 2010). This suggests that interactive review may be better suited for learning than asynchronous review.

Review effectiveness can also be influenced by contextual features. First, reviewers detect more conclusion errors in complex tasks when they are familiar (versus unfamiliar) with preparers, but review effectiveness does not differ for routine tasks (Asare & McDaniel 1996). Second, average audit managers show bias by rating memos from outstanding seniors more favorably when they know the auditors' identities, but this bias is absent when the identities are unknown (Tan & Jamal 2001). Third, reviewers are in some circumstances more likely to agree (disagree) with preparer justifications that align (do not align) with their initial opinions (Tan & Shankar 2010). Finally, when preparers are biased by their feelings toward the client personnel and reviewers know this, reviewers rely *more* on the workpaper – an 'ironic rebound effect' (Frank & Hoffman 2015).

### *Persuasion and follow-up*

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<sup>6</sup> Ramsay (1994) defines mechanical errors as objective, verifiable, and concrete and conceptual errors as subjective, unverifiable, and imprecise. Detecting conceptual errors requires the use of conceptual and analytical cognitive processing.

Audit review can be viewed as an exercise in persuasion (Gibbins & Trotman 2002; Rich *et al.* 1997). A key finding is that preparers tailor the form and content of workpapers to meet the idiosyncratic preferences of the reviewers they expect to face (e.g., Agoglia, Kida, & Hanno 2003; Rich *et al.* 1997). To the extent reviewers are persuaded by stylization attempts, workpaper conclusions may be accepted prematurely and errors may go unnoticed, impeding learning from audit review.

Preparers can best learn from the review process by responding to comments and following through to corrective action. Preparers who receive timely (versus untimely) reviews spend more time following up on review points. Also, when the review is timely, conclusion-framed (versus documentation-framed) review notes positively influence follow-through (Lambert & Agoglia 2011), suggesting increased learning opportunities. Unfortunately, preparers attribute negative events during the audit review (such as lack of feedback from the reviewer or the preparer feeling like a scapegoat in the review process) to external factors, but they attribute positive events to their own effective communication and good relationships with their supervisor (Andiola, Bedard, & Westermann 2019). Attributing negative events to external factors is likely to hamper learning from errors, as it reduces the probability that preparers will consciously reflect on what they did wrong and how they can improve.

#### *Avenues for future research*

Research to date has largely focused on the audit review's role in detecting and correcting errors, so we know little about how reviewers provide guidance and coaching to workpaper preparers. Future research could examine how coaching is provided and differences in effectiveness across coaching methods (Andiola *et al.* 2023). There is also more to learn about factors influencing the effectiveness of reviews. For example, does the framing of review points



as focusing on goals of complete documentation versus accurate conclusions affect follow-up and related learning? Does the style or tone in which the review points are delivered affect follow-up? Can principles of gamification be used to make the review process more engaging, less threatening, and more educational? In addition, how is review effectiveness impacted by the remote work environment? Finally, it is important to understand how learning from audit review interacts with other types of learning. That is, a preparer who receives a review comment may consult peers, clients, or specialists to address the comment, implying that the review process can spark other learning processes. Panel F of Table 1 provides research questions related to learning from audit review.

## **5.2. ON-THE-ENGAGEMENT LEARNING PROCESSES WHERE OTHERS HAVE A PASSIVE ROLE**

### **5.2.1. Learning from experience**

Experiential learning theory (ELT) defines learning from experience as “the process whereby knowledge is created through experience. Knowledge results from the combination of grasping and transforming experience” (Kolb 1984, p. 41). ELT prescribes that experience is grasped through concrete experience and abstract conceptualization and is transformed through reflective observation and active experimentation (Kolb 1984; Kolb, Boyatzis, & Mainemelis 2014). Specifically, the four-stage learning cycle starts with concrete experiences, which are the basis for observations and reflections. These reflections are used to distill abstract conceptualizations, and the conceptualizations are used to draw new implications which can be actively tested (Kolb *et al.* 2014).

Learning from experience is long recognized as important to building expertise in auditing. Libby (1995, p. 180) defines experiences as “task-related encounters that provide opportunities for learning.” Auditors report that “learning from completing new tasks in my work” and “learning

from applying past experience” are their most favored learning strategies (Hicks *et al.* 2007, p. 67). Improved judgment performance in accounting settings is conceived to be a function of experience, ability, knowledge, motivation, and the audit environment (Bonner & Lewis 1990; Libby & Luft 1993). That is, experience results in better knowledge, knowledge results in better performance, and ability affects both knowledge and performance directly (Libby & Luft 1993). Table 8 lists the papers we consider on learning from experience, in general. We classify studies according to the stage of ELT they cover. We discuss the more specific cases of learning from interacting with clients and learning in teams in section 5.2.2. and 5.2.3., respectively.

*[Insert Table 8 here]*

### *Concrete experiences*

An important question prompted by the early literature is whether the audit environment is conducive to learning from concrete experiences.<sup>7</sup> That is, concrete experiences, particularly with errors, may be insufficient for learning in the audit environment. Ashton (1991) points out that auditors conduct relatively few audits every year, the individual audits are very different from each other, and auditors’ encounters with reporting errors are rare. As error frequency knowledge is best developed through direct rather than indirect experience (Butt 1988), the paucity of concrete experiences with errors in the audit environment may make learning error frequencies challenging. There are at least a few audit tasks in which concrete experiences are sufficient to cause

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<sup>7</sup> Early literature on learning from experience in the audit environment is based on the behavioral view of expertise. This view compares judgments made by expert auditors with those made by novice auditors. A typical study taking the behavioral view focuses on how auditor expertise (as proxied by years of experience) affects judgment outputs (e.g., Ashton & Brown 1980; Ashton & Kramer 1980; Gaumnitz, Nunamaker, Surdick, & Thomas 1982; Hamilton & Wright 1982; Messier 1983; Nanni 1984). This stream of literature produced some surprising results, such as that expert auditors do not make significantly different judgments than novice auditors. However, some of these contradictory findings have since been attributed to design issues (for example, see Bédard 1989; Bonner & Lewis 1990; Graham 1993; Libby & Luft 1993). As a result, findings from these early studies should be interpreted with caution and in light of subsequent design refinements.

performance gains. These include resolving financial accounting inquiries in a national office (Salterio 1994), as well as auditing loan loss judgments (Wright 2001), research and development expenditures (Moroney & Carey 2011), and fair value estimates (Ahn, Hoitash, & Hoitash 2020).

Bonner (1990; 1991) highlights the importance of considering task type and the cognitive processes invoked when studying the relationship between experience and judgment performance. Specifically, more experienced auditors can be expected to perform better only when the task makes use of knowledge and processes that would be learned through experience. Thus, experienced auditors outperform inexperienced auditors in both cue selection and cue weighting in analytical risk assessment, where their better error frequency knowledge is useful, but less so in control risk assessment (Bonner 1990), where the key knowledge is acquired in formal education.

#### *Reflective observation*

There is limited evidence on the role of reflective observation in auditor learning. Earley (2001) provided indirect evidence by investigating whether audit firms can enhance learning from experience through two low-cost interventions. She found that both explanatory feedback and self-explanation of the rationale underlying a judgment improve procedural knowledge acquisition. Moreover, a combination of both interventions is more effective than either of the interventions alone.

#### *Abstract conceptualization*

The abstraction process in learning from experience should result in higher quality knowledge structures. Several studies demonstrate that more experienced auditors have better knowledge structures for auditing content than less experienced auditors (Choo & Trotman 1991; Frederick 1991; Libby 1985; Libby & Frederick 1990; Weber 1980). Waller and Felix (1984) provide a rationale for how learning from experience alters one's knowledge structure. At the

beginning of an auditor's career, knowledge is mostly declarative and is organized in categories and schemata. Waller and Felix (1984) posit that when an auditor learns from experience, the auditor's production system is modified such that condition-action pairs are changed after repeated application, resulting in more refined condition-action pairs.

Having appropriate knowledge structures (e.g., transaction cycles) in place provided by instruction prior to experience can enhance auditors' learning from experience (Bonner *et al.* 1997), and these knowledge structures mediate the relationship between knowledge structure training and performance in tasks where the knowledge structures and case structures are compatible (Borthick *et al.* 2006). That said, inappropriate knowledge structures can also lead to judgment problems. For example, experience leads auditors to structure their knowledge of financial statement errors based on the relevant audit objective. While this is efficient for some tasks, it can negatively impact performance for tasks that are instead structured on transaction cycles (Nelson, Libby, & Bonner 1995).

#### *Active experimentation*

We were unable to identify any studies about active experimentation in audit firms. Survey evidence suggests that auditors lack opportunities to experiment in their work (Hicks *et al.* 2007). The technocratic and rules-based auditing environment, as well as a general lack of rewards for going beyond the minimum and concerns about how inspectors will react to novel approaches may hamper learning through active experimentation (Peecher, Solomon, & Trotman 2013; Power 1997).

#### *Avenues for future research*

Given the dearth of direct, concrete learning experiences in the audit environment, research can examine whether, and if so how, auditors can learn in the absence of such experience. For

example, in what circumstances can concrete experience effectively be replaced by vicarious “experiences” or analogue tasks? There also appears to be limited opportunity for reflective observation in the auditing setting. Future research could examine whether it would be helpful to embed interventions to trigger reflective observation in specific tasks, such as documentation, or even in other learning processes such as the audit review. Finally, future research can also examine whether simulation or other tools can be used to allow experimentation in auditing without imposing risks on engagement outcomes. Panel G of Table 1 lists research questions related to learning from experience.

### **5.2.2. Learning from interactions with clients**

Most novice auditors spend around half of their time on the client’s premises, implying that there are ample opportunities to learn from clients (Eraut 2007; Guénin-Paracini *et al.* 2015; Watkins & Cervero 2000). To complete their audit tasks, auditors must learn about the client’s business and industry. Through this process, auditors develop subspecialty knowledge and industry expertise (Bonner & Lewis 1990; Solomon, Shields, & Whittington 1999). Auditors also learn other information from encounters with the client (Daoust & Malsch 2020; Eraut 2007). For example, they may learn about transactions, audit procedures, and even accounting rules based on clients’ experience. In our review below, we separately consider learning about the client and learning from encounters with the client.<sup>8</sup> Table 9 provides an overview of studies examining factors relating to learning from client interactions.

[Insert Table 9 here]

#### *Learning about the client*

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<sup>8</sup> We acknowledge that auditors interact with, and likely learn from, a range of others beyond client management in the financial reporting ecosystem. These might include internal auditors, audit committees, and regulators. Due to space considerations, we omit consideration of these “others” from this paper.

Auditors develop subspecialty knowledge through specific indirect experience (e.g., training) and direct experience in a particular industry (Bonner & Lewis 1990). Industry specialization is expected to lead to higher audit quality because industry-specialist auditors are better able to assess risks and make audit planning decisions (Low 2004), are better able to detect industry-specific errors (Owhoso, Messier, & Lynch 2002), and have more complete representations about misstatements in their industry of specialization (Hammersley 2006). Whereas industry specialization is likely to improve auditor performance in identifying non-error or industry-specific error situations, there is mixed evidence with respect to its ability to improve performance in situations involving errors that are not industry-specific (Solomon *et al.* 1999).

An important consideration is the extent to which knowledge about clients and industries is transferable to other clients or industries. Prior literature supports the idea that audit knowledge is transferable across task and industry contexts (Thibodeau 2003). Furthermore, knowledge gained from working on non-audit services at a client can help an auditor to better understand the client's business model (Beck & Wu 2006) and can be transferred to audit tasks, but only if the same auditor conducts both tasks (Joe & Vandervelde 2007).

#### *Learning from encounters with the client*

Auditors can learn from interactions with the client (Eraut 2007; Carlisle, Gimbar, & Jenkins 2023). Client managers who are former auditors teach auditors aspects of audit procedures and basic accounting notions, and some even proactively coach junior auditors (Daoust & Malsch 2020). More commonly, auditors often resolve audit issues by communicating with the client (Bobek, Daugherty, & Radtke 2012; Dirsmith & Covaleski 1985). That said, when junior auditors expect they will be intimidated by older and thus intimidating client personnel, they tend to avoid critical interactions (Bennett & Hatfield 2013). Computer-mediated communication reduces the

effect of intimidation; however, it also leads to shorter interactions, fewer follow-up questions, and less “back and forth” dialogues (Bennett & Hatfield 2018). This suggests that computer-mediated communication has both positive and negative effects on auditor learning from the client. Open client communication is important both to auditors’ work and to their ability to learn from clients. Auditors further note that including a more experienced auditor in a conversation with a client is a good learning experience (Carlisle *et al.* 2023).

#### *Avenues for future research*

Most of the research on auditor industry expertise is at least twenty years old. Business practices have become more complex in recent years, so client and industry knowledge likely remain critical. However, as firms develop more sophisticated technologies to help deliver audits, it seems worthwhile to consider whether specialized client and industry knowledge should remain in auditors’ minds or whether it would be more effective if they are embedded to a greater degree in the firm’s technology, where it is perhaps easier to update and more readily sharable. To the extent that industry knowledge is best learned by direct experience, the value of technology-provided knowledge may be limited. Research can also investigate why direct experience seems to provide more effective learning of this information.

Finally, given that social mismatches can prevent auditors from interacting with clients to get needed evidence (e.g., Bennett & Hatfield 2013), research could examine whether individual auditor characteristics such as extraversion, self-confidence, and self-esteem influence the extent to which auditors interact with and can learn from clients. Alternatively, research may identify interventions to remove communications barriers. Further investigation of how computer-mediated communication affects auditor learning, in terms of development of client relationships,

detection of non-verbal cues, and professional skepticism, among other aspects is also warranted. Panel H of Table 1 provides research questions related to learning from interacting with clients.

### **5.2.3. Learning in teams**

The size and complexity of businesses, along with the scope of expertise needed to perform an audit necessitate that most audit work be done in teams (Cameran, Ditillo, & Pettinicchio 2017). Research outside of auditing finds that team learning can result in individual learning, team effectiveness, organizational learning, and innovation (e.g., Nellen, Gijssels, & Grohnert 2020; Van den Bossche, Gijssels, Segers, & Kirschner 2006). To learn from each other, team members must engage in communicative behaviors including sharing knowledge, competencies, opinions, and thoughts, co-constructing knowledge and meaning, and engaging in constructive conflict to develop better solutions (Decuyper, Dochy, & Van den Bossche 2010). Auditing research on learning in teams mostly focuses on whether certain ideas, errors, or issues are shared. Following Eraut (2007), we distinguish learning from participating in group processes and learning from working alongside others. Table 10 provides an overview of the papers we examined on learning in teams.

*[Insert Table 10 here]*

#### *Learning from participating in group processes*

Auditing standards require that audit teams discuss (ISA 240, ISA 315) or brainstorm (AU 316) fraud risks during audit planning (AICPA 2002; IFAC 2009a; 2009b). Thus, fraud brainstorming is a key team audit task. A brainstorming session provides opportunities for auditors to gain knowledge and learn new perspectives indirectly by observing and listening to their colleagues (Osborn 1957). Interacting with other auditors in a brainstorming team provides more direct opportunities to build on ideas raised by team members (Brazel, Carpenter, & Jenkins 2010;



Carpenter 2007). Following the team learning and brainstorming literatures, most audit studies in this area compare judgments across groups with different compositions or different brainstorming procedures.

Brainstorming procedures affect learning opportunities and judgment quality by influencing team members' willingness to share ideas and engage in co-construction of new ideas. Setting the right ground rules by providing appropriate brainstorming guidelines or pre-mortem instructions can improve brainstorming effectiveness (Trotman, Simnett, & Khalifa 2009).<sup>9</sup> Moreover, computer-mediated brainstorming using interactive groups and nominal groups is more effective than traditional face-to-face brainstorming (Lynch, Murthy, & Engle 2009). Conditional on using computer-mediated brainstorming, nominal groups outperform interacting groups due to social loafing by less experienced auditors (Chen, Trotman, & Zhou 2015). Hoffman and Zimbelman (2009) find that both strategic reasoning and brainstorming in groups improve performance, but the combination of both does not outperform either procedure, alone.

To learn from participation in group processes, group members should be proactive, speak up, and share information during those processes (Decuyper *et al.* 2010). Psychological safety during an audit brainstorming session improves less knowledgeable auditors' willingness to speak up (Gissel & Johnstone 2017). Also, an intervention in which audit team leaders prompt teams about professional skepticism and the importance of training and development improves brainstorming outcomes (Dennis & Johnstone 2018).

### *Learning from working alongside others*

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<sup>9</sup> In Trotman *et al.* (2009), the brainstorming guidelines are consistent with Osborn's (1957, p. 84) guidelines: "criticism is ruled out; freewheeling is welcome; combination and improvement are sought; and most important: quantity is wanted". In a pre-mortem group, auditors simulate how an action may be carried out and take the perspective in which they actively search for flaws in their plans.

Auditors indicate that working alongside others is “extremely important” to their learning (Eraut 2007, p. 409). Effective learning from others in the audit environment requires knowledge sharing within audit teams (Nelson, Proell, & Randel 2016; PCAOB 2010b; Solomon 1987;). To facilitate the learning process of junior auditors, knowledge sharing should work in two ways. First, junior auditors must raise potential audit issues that they observe and ask for help when they need it. Second, experienced auditors must communicate with junior auditors about how staff-raised audit issues are resolved (Griffith, Kadous, & Proell 2020).

Audit team leaders can take various actions to foster within-team communication and provide a positive learning environment. First, bringing up potential errors and audit issues can increase audit quality and improve learning, but doing so comes at a potential cost for the auditor that speaks up. Top management in the audit firm can use tone at the top and error management climates to foster learning and performance (PCAOB 2012). An open error management climate can increase auditors’ willingness to report errors, but only when they are mechanical, and not when they are conceptual (Gold, Gronewold, & Salterio 2014). An open error management climate also increases auditors’ willingness to report errors made by a peer, providing an opportunity for the peer to learn. Understanding the role of error management in the production of audit quality requires consideration of the role of formal error prevention and the role of informal error resilience, and how they interact across multiple levels of the audit firm (Seckler, Gronewold, & Reihlen 2017).

Second, team leader actions can foster or hamper auditors’ speaking up about audit issues (Clor-Proell, Kadous, & Proell 2022). For example, auditors are more likely to speak up about potential audit issues if their team leader prioritizes team success over personal success, and if the issue aligns with the leader’s focus on either efficiency or effectiveness (Nelson *et al.* 2016).

Auditors with an intrinsic motivational orientation (i.e., an interest in learning) are also more likely to speak up, but some still report being unwilling to do so even when it is necessary, indicating foregone opportunities to learn from issues (Kadous, Proell, Rich, & Zhou 2019). Team leaders can foster auditors' willingness to share issues by emphasizing intrinsic rather than extrinsic goals. Junior auditors often seek advice from peers about raising issues, but, because their peers also lack knowledge about issue importance, this can lead to underestimation of the importance of speaking up and incorporating non-diagnostic information into their speaking up decision (Griffith *et al.* 2020). However, high-quality supervisor feedback can increase auditors' willingness to raise issues and provide opportunities for learning in the workplace (Griffith *et al.* 2020). Although speaking up may irritate the team leader during the audit engagement, if the issues raised align with the leader's focus, auditors that speak up receive more favorable performance evaluations (Nelson & Proell 2018). Finally, as upward communication is risky, auditors prefer to communicate passively, even though seniors reward auditors that communicate assertively (Proell, Zhou, & Nelson 2022). This suggests that providing opportunities to convey the information in alternative ways may be helpful.

#### *Avenues for future research*

Literature on workplace learning identifies that a balance of sharing, co-construction, and constructive conflict behaviors is needed for learning in teams (Decuyper *et al.* 2010). Most research in auditing focuses on factors influencing sharing ideas, errors, and audit issues. Future research can investigate the roles of co-construction and constructive conflict in the audit environment. This may especially be interesting since auditors frequently change teams and work concurrently on multiple teams. For example, questions might arise as to whether co-construction and constructive conflict can emerge under these conditions, and, if so, what factors facilitate them.

Team leaders' actions can likely support such processes, but group composition may moderate their effectiveness. The strict hierarchy in auditing may interfere with these desirable processes if more junior auditors are concerned about their reputations with their superiors. Moreover, we know little about when supervisors take an active role in the learning process. Finally, given the ubiquity of teams in auditing, we need more research on the relationship between team learning and structural elements of team composition such as team size, team autonomy, team tenure, and team diversity. Panel I of Table 1 provides research questions related to learning in teams.

## **6. Discussion and Future Directions**

This paper starts with the observation that the auditing literature contains much prior research that can illuminate auditor learning processes, despite that it often does not explicitly focus on learning. We develop the ALF to provide structure to the literature and to provide researchers and practitioners with a comprehensive view of how auditor learning can be facilitated. We then review the literature that pertains to the learning processes contained in the ALF, drawing out insights and identifying gaps in our knowledge about how auditors learn.

Several important insights emerge from our review of the literature on auditor learning. Our first insight relates to the location of learning. On-the-engagement learning processes provide opportunities for concrete experiences; however, stimuli are dynamic, feedback is often indirect and limited, and errors are rare. Thus, a commonality we find across on-the-engagement learning processes is that reflection is especially important to learning because reflection helps to translate concrete experiences into abstract conceptualizations. That said, aspects of the auditing environment, including time pressure, may leave little room for reflection. Thus, we suggest that audit firms develop ways to create moments of reflection to enhance auditor learning and that researchers help to better understand the determinants, consequences, and processes of reflection.

Second, learning processes are affected by others' roles in the learning process. When others have an active role in the learning process, the quality of the relationship between the auditor and the other appears to be key to auditor learning. However, the relationship is complex—a more positive, more intense relationship is not always better. For instance, informal mentorship that is too intensive can lead to role stress (Viator 2001), different types of feedback may be necessary depending on the familiarity with each other (Harding & Trotman 2009), and developed social bonds may create openness to contrary advice but interfere with evaluation of advice quality (Kadous *et al.* 2013).

Third, examinations of how auditor learning processes interact with each other can advance the auditing literature. The existing literature analyzes distinct learning processes, but these processes likely interact. Potential areas of interest include the optimal sequencing of different types of learning, exploring under what circumstances there are potential synergies in combining learning processes, and examining what interventions audit firms can take to improve such synergies.

Fourth, increased automation and outsourcing of audit tasks have changed the roles of junior auditors, implying that the types of knowledge these auditors need has changed over time (e.g., Bol *et al.* 2018). We therefore highlight that it may be worthwhile for researchers to replicate prior literature and retest whether key results still hold, especially where a priori reasoning suggests relationships may have changed. In addition to the increase in automation and outsourcing of structured audit tasks (Bennett & Hatfield 2018; Bol *et al.* 2018; Zhang *et al.* 2022), potential areas of interest include how remote work (Bauer *et al.* 2022) and generational differences in attitudes towards work (Westermann *et al.* 2015) impact auditor performance and learning.

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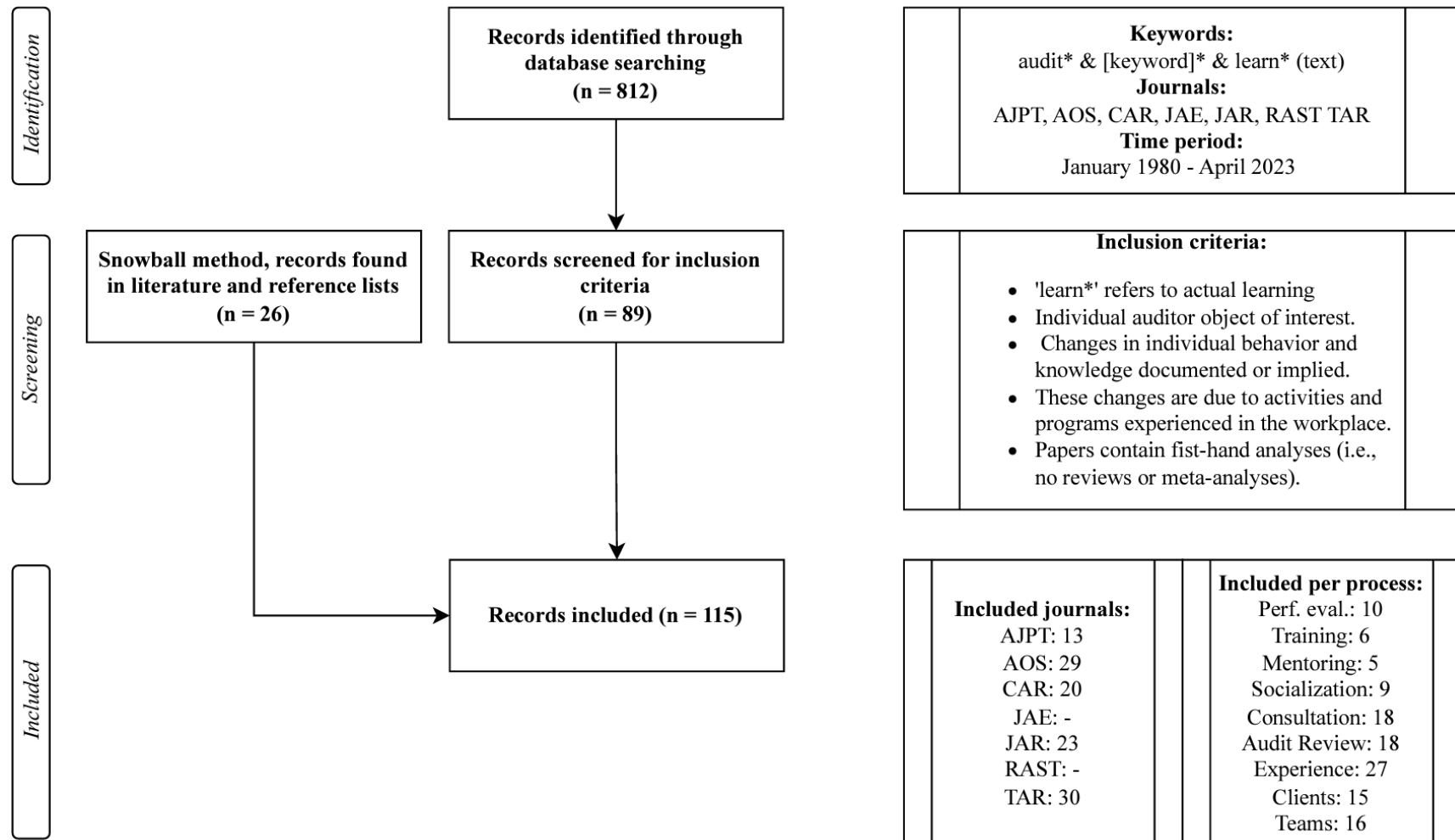
## Figures

**FIGURE 1: AUDITOR LEARNING FRAMEWORK**

<b>Role of Others</b>	<i>Active</i>	<p><i>Learning from</i></p> <p><b>Performance Evaluation</b></p> <p><b>Training</b></p> <p><b>Mentoring</b></p>	<p><i>Learning from</i></p> <p><b>Consultations</b></p> <p><b>Audit Review</b></p>
	<i>Passive</i>	<p><i>Learning from</i></p> <p><b>Socialization</b></p>	<p><i>Learning from</i></p> <p><b>Experience</b></p> <p><b>Interactions with Clients</b></p> <p><b>Teams</b></p>
		<i>Off the Engagement</i>	<i>On the Engagement</i>
<b>Location of Learning</b>			

*Notes:* Figure 1 presents the Auditor Learning Framework (ALF). The framework distinguishes learning processes based on two dimensions: the location of learning (*off the engagement* or *on the engagement*) and the role of others (*active* or *passive*). On-the-engagement learning takes place while auditors are conducting their primary work functions and is therefore likely to be incidental to other work tasks. Off-the-engagement learning takes place outside of the primary job tasks. With an active role for others, we indicate others that directly and proactively intervene in the learning process. For instance, others may function as trainer, guide, or facilitator during the learning process. In contrast, learning may also occur without others involved or with others involved, but in passive roles that impart learning as a by-product of conducting some other tasks.

**FIGURE 2: SAMPLE SELECTION PROCESS AND INCLUSION CRITERIA**



*Notes:* Figure 2 displays the sample selection criteria and the inclusion criteria. The methodology and sample selection process are described in Section 3. We reviewed studies from six top core accounting journals and the leading field journal in auditing using relevant keyword searches in the journal databases. The keywords, journals, and time period are displayed in the top right box. Furthermore, we use inclusion criteria displayed in the middle right box. The number of included papers per journal and per learning process are displayed in the bottom right boxes. The number of papers is higher than the total number of papers in the per process box as some papers cover multiple processes.

## Tables

**TABLE 1: EXAMPLES OF OPPORTUNITIES FOR FUTURE RESEARCH ON LEARNING IN THE AUDITING PROFESSION**

<b>Panel A: Learning from performance evaluation</b>	
RQ 1	How are different performance dimensions (e.g., technical ability, work efficiency, oral communication skills, and motivation) weighted during the performance evaluation process? Are these weightings appropriate for advancing auditor learning?
RQ 2	How can the performance evaluation process be improved to more accurately assess the skills and abilities of auditors? Are some skills and abilities more accurately assessed than others? How can negative impacts of inaccurate performance evaluations on auditor learning be mitigated?
RQ 3	When is negative feedback necessary for learning? How can negative feedback most effectively be given? What other features of feedback enhance or detract from learning from performance evaluation?
RQ 4	How do individual factors such as auditors' motivation to learn, ability to self-reflect, and growth mindset affect learning from performance evaluations in the auditing profession?
RQ 5	How do performance evaluations relate to the way in which further training, mentoring, or other resources are allocated to auditors? How can performance evaluations be used to more effectively allocate these resources?
<b>Panel B: Learning from training</b>	
RQ 6	Can soft skills and tacit managerial knowledge be learned from training? How does the ideal combination of training tasks, types of feedback, and interventions vary for learning different types of knowledge?
RQ 7	How does the delivery method (or combination of delivery methods) for training in audit firms affect workplace learning? Does the effectiveness of methods and combinations of methods vary by what is being learned?
RQ 8	How is training best combined with and sequenced with on-the-engagement learning processes? What conditions make training more or less important to the combination?
RQ 9	How effectively is knowledge from training transferred to the audit workplace? What factors influence this transfer to the workplace in the audit environment? Can we develop ways to test for and improve knowledge transfer?
<b>Panel C: Learning from mentoring</b>	
RQ 10	What are the consequences of role stress caused by intensive informal mentoring for learning and performance? How can the role stress and/or its negative consequences be mitigated?
RQ 11	Is informal mentoring provided in a fair manner across firms? How can the firm support or restructure mentoring to retain the effectiveness of informal processes while ensuring high-quality mentoring is available to all auditors?
RQ 12	Which mentor skills and experiences are most important to effective mentoring? How can the firm develop these skills in potential mentors?
RQ 13	Do mentor-mentee relationships benefit from matching on background or personality attributes? What other factors improve these relationships?
RQ 14	When does mentor separation or rotation ideally occur to stimulate learning in audit firms?
RQ 15	What mentoring roles are most effective in stimulating learning?
<b>Panel D: Learning from socialization</b>	
RQ 16	Does audit firms' recruiting process take into account expectations of successful socialization? If so, what factors are relevant to this selection and do firms accurately assess them?
RQ 17	Does auditor socialization occur prior to the recruitment? If so, how?
RQ 18	What is the role of auditor diversity (e.g., gender diversity) in learning from socialization processes? How can socialization be changed to improve outcomes for underrepresented groups?
RQ 19	How has the learning from socialization by staff auditors changed in the past decades?
RQ 20	What factors increase or decrease the effectiveness of socialization?
<b>Panel E: Learning from consultation</b>	

- RQ 21 Does the pro-client bias inherent in incorporating advice from consultation inhibit auditor learning or does it just create “in the moment” resistance to information? That is, does the auditor apply the knowledge in future even if not in the current audit? If so, can other learning processes be utilized to speed the learning process?
- RQ 22 What are the barriers to learning from advice? What conditions and interventions can encourage auditors to better learn from formal and informal consultation? From specialists?
- RQ 23 How can advice be constructed and/or presented to improve its persuasiveness?
- RQ 24 How do auditors choose advisors? When do they choose advisors who will provide them with new information versus tell them what they want to hear? What interventions can increase auditors’ likelihood of choosing advisors who they can learn from?

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**Panel F: Learning from audit review**

- RQ 25 How is the review process used for coaching? What factors cause reviewers to take a coaching approach in the audit review process?
- RQ 26 How do preparers learn from incorporating reviewer comments? Are learning effects different for documentation-framed and conclusion-framed comments? Do learning effects vary based on the style and tone of delivery?
- RQ 27 Can theory and techniques of gamification be incorporated into the workpapers to enhance learning from reviews?
- RQ 28 How does a remote work environment affect learning from the review process? If there are negative impacts, what steps can be taken to mitigate these?
- RQ 29 How do preparers approach responding to review comments? Does audit review cause preparers to engage with other learning processes, including learning from consultation with peers and/or specialists.

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**Panel G: Learning from experience**

- RQ 30 What learning processes do audit firms use to substitute direct experience in cases where direct experience is rare? When can vicarious experiences or analogue tasks be useful for learning material that is not directly experienced?
- RQ 31 What prompts auditors to engage in reflective observation? Do interventions be embedded in documentation tasks to help auditors to reflect and learn? Can other learning processes, such as learning from audit review, be combined with direct experience to enhance learning?
- RQ 32 Does the auditing profession lead to better learning opportunities for auditors with certain personality traits? Is learning hampered for extraverted auditors?
- RQ 33 How can we facilitate active experimentation on the engagement? Can simulation or other technology be used to facilitate active experimentation?

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**Panel H: Learning from interacting with clients**

- RQ 34 Do the advantages of industry specialization revealed in prior research hold today?
- RQ 35 Can industry knowledge be effectively located in firm technology and tools, rather than specialist auditors? What are the implications for the accessibility and application of this knowledge?
- RQ 36 What aspects of direct experience contribute to learning of industry knowledge? Is direct experience more engaging/motivating? Can principles from direct experience be applied to improve auditor learning of error-related industry knowledge?
- RQ 37 What auditor individual characteristics are important for open and productive communication with (and learning from) clients? How do these characteristics match up with those that contribute to high audit quality in other ways?
- RQ 38 How does computer-mediated communication affect auditor learning via development of client relationships, detection of non-verbal cues, etc.?

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**Panel I: Learning in teams**

- RQ 39 What is the role of co-construction and constructive conflict in how auditors learn in teams? Do co-construction and constructive conflict take place in an audit setting?
- RQ 40 How do changing teams and participation on multiple teams impact auditor participation in co-construction and constructive conflict processes? Does the strict hierarchy in audit firms affect junior auditors’ participation in these processes? Can changes in group composition improve participation?
- RQ 41 When do supervisors take an active role in the learning process? Is supervisor coaching about speaking up helpful? Where is it more or less helpful?
- RQ 42 What is the relationship between team composition, team learning, and team performance?
-

**TABLE 2: LEARNING FROM PERFORMANCE EVALUATION**

<b>Performance dimensions evaluated</b>	<b>Type of feedback</b>	<b>Accuracy of performance evaluations</b>
Wright (1982)	Kida (1984)	Kennedy and Peecher (1997)
Kida (1984)	Leung and Trotman (2005)	Jamal and Tan (2001)
Tan and Libby (1997)	Harding and Trotman (2009)	Tan and Jamal (2001)
Bol <i>et al.</i> (2018)	Andiola and Bedard (2018)	Harding and Trotman (2009)

**TABLE 3: LEARNING FROM TRAINING**

<b>Design of training</b>
Bonner and Walker (1994)
Bonner <i>et al.</i> (1997)
Earley (2001)
Borthick <i>et al.</i> (2006)
Moreno <i>et al.</i> (2007)
Plumlee <i>et al.</i> (2015)

**TABLE 4: LEARNING FROM MENTORING**

<b>Mentoring</b>
Dirsmith and Covaleski (1985)
Scandura and Viator (1994)
Viator (2001)
Viator and Pasewark (2005)
Daoust and Malsch (2019)

**TABLE 5: LEARNING FROM SOCIALIZATION**

<b>Staff level</b>	<b>Manager level</b>	<b>Partner level</b>
Dirsmith and Covaleski (1985)	Kornberger <i>et al.</i> (2011)	Lander <i>et al.</i> (2013)
McNair (1991)		Carter and Spence (2014)
Grey (1998)		Spence <i>et al.</i> (2017)
Anderson-Gough <i>et al.</i> (2001)		
Anderson-Gough <i>et al.</i> (2005)		

**TABLE 6: LEARNING FROM CONSULTATION**

<b>Formal and informal consultations</b>	<b>Engaging specialists</b>
Emby and Gibbins (1988)	Asare and Wright (2004)
Salterio (1994)	Gold <i>et al.</i> (2012)
Salterio (1996)	Cannon and Bedard (2017)
Kennedy <i>et al.</i> (1997)	Griffith <i>et al.</i> (2015)
Salterio and Denham (1997)	Griffith (2018)
Salterio and Koonce (1997)	Wright and Bhattacharjee (2018)
Kadous <i>et al.</i> (2013)	Bauer and Estep (2019)
Knechel and Leiby (2016)	Griffith (2020)
Duh <i>et al.</i> (2020)	Estep (2021)

**TABLE 7: LEARNING FROM AUDIT REVIEW**

<b>Review effectiveness</b>	<b>Persuasion and follow-up</b>
Trotman (1985)	Rich <i>et al.</i> (1997)
Trotman and Yetton (1985)	Gibbins and Trotman (2002)
Libby and Trotman (1993)	Agoglia <i>et al.</i> (2003)
Ramsay (1994)	Lambert and Agoglia (2011)
Ismail and Trotman (1995)	Andiola <i>et al.</i> (2019)
Asare and McDaniel (1996)	
Bamber and Ramsay (1997)	
Harding and Trotman (1999)	
Tan and Jamal (2001)	
Brazel <i>et al.</i> (2004)	
Payne <i>et al.</i> (2010)	
Tan and Shankar (2010)	
Frank and Hoffman (2015)	

**TABLE 8: LEARNING FROM EXPERIENCE**

<b>Concrete experiences</b>	<b>Reflective observation</b>	<b>Abstract conceptualization</b>
Ashton and Brown (1980)	Earley (2001)	Weber (1980)
Ashton and Kramer (1980)		Waller and Felix (1984)
Hamilton and Wright (1982)		Libby (1985)
Gaumnitz <i>et al.</i> (1982)		Libby and Frederick (1990)
Messier (1983)		Choo and Trotman (1991)
Nanni (1984)		Frederick (1991)
Butt (1988)		Nelson <i>et al.</i> (1995)
Bonner (1990)		Bonner <i>et al.</i> (1997)
Bonner and Lewis (1990)		Borthick <i>et al.</i> (2006)
Bonner (1991)		
Ashton (1991)		
Graham (1993)		
Libby and Luft (1993)		
Salterio (1994)		
Wright (2001)		
Moroney and Carey (2011)		
Ahn <i>et al.</i> (2020)		

**TABLE 9: LEARNING FROM INTERACTIONS WITH CLIENTS**

<b>About the client</b>	<b>From encounters with the client</b>
Bonner and Lewis (1990)	Dirsmith and Covalleski (1985)
Solomon <i>et al.</i> (1999)	Bobek <i>et al.</i> (2012)
Owhoso <i>et al.</i> (2002)	Bennett and Hatfield (2013)
Thibodeau (2003)	Bennett and Hatfield (2018)
Low (2004)	Daoust and Malsch (2020)
Beck and Wu (2006)	Carlisle <i>et al.</i> (2023)
Hammersley (2006)	
Joe and Vandervelde (2007)	

**TABLE 10: LEARNING IN TEAMS**

<b>Participating in group processes</b>	<b>Working alongside others</b>
Carpenter (2007)	Gold <i>et al.</i> (2014)
Hoffman and Zimbelman (2009)	Nelson <i>et al.</i> (2016)
Lynch <i>et al.</i> (2009)	Seckler <i>et al.</i> (2017)
Trotman <i>et al.</i> (2009)	Nelson and Proell (2018)
Brazel <i>et al.</i> (2010)	Kadous <i>et al.</i> (2019)
Chen <i>et al.</i> (2015)	Griffith <i>et al.</i> (2020)
Gissel and Johnstone (2017)	Clor-Proell <i>et al.</i> (2022)
Dennis and Johnstone (2018)	Proell <i>et al.</i> (2022)