Promoting Proactive Auditing Behaviors

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ABSTRACT

Auditors work in complex, dynamic environments where complete directives are often unavailable. Thus, in order to achieve high quality audit outcomes, auditors need to think and act proactively. For example, auditors should proactively respond to unanticipated risks, coordinate effectively with clients, and develop the talent of junior auditors. We experimentally examine whether there are common conditions that encourage auditors to engage in a range of distinct proactive behaviors. Drawing on literature on employee proactivity, auditor tacit knowledge, and regulatory focus theory, we predict and find that auditors with more autonomy are more proactive, but only when they have both higher tacit knowledge and a focus on achieving positive job outcomes (rather than avoiding negative job outcomes). Our contributions include introducing the proactivity construct to the auditing literature, identifying antecedents to auditor proactivity, and advancing the management literature by providing evidence about how determinants of proactivity interact.
INTRODUCTION

Auditors work in complex, dynamic, and socially demanding environments (Peecher, Solomon, and Trotman 2013; Bol, Estep, Moers, and Peecher 2018) where it is critical to be proactive to achieve quality audit outcomes. It is helpful when auditors, for example, proactively respond to new or unexpected information (e.g., by modifying the audit plan or speaking up; Nelson, Proell, and Randel 2016; Hammersley and Ricci 2018), have the foresight to coordinate effectively with clients (Guénin-Paracini, Malsch, and Temblay 2015), and take the initiative to develop the talent of junior auditors (Westermann, Bedard, and Earley 2015; Andiola, Brazel, Downey, and Shaefer 2018). Further, each audit engagement is unique, featuring idiosyncratic risks, client characteristics, and engagement team characteristics (Knechel et al. 2013). Thus, supervisors generally cannot provide subordinates with complete, formal directives about when and how to pursue proactive behaviors. Instead, auditors must identify and selectively pursue opportunities to engage in proactive behaviors that will improve facets of audit quality.

Yet, remarkably little is known about situational or dispositional factors that facilitate or hinder auditors’ proactive behaviors (i.e., anticipatory actions that auditors choose to take to influence their work and work environment, without receiving explicit directives). Improving our understanding of these factors is important because proactive behaviors enhance audit quality, according to practitioners (Meyer 2017) and their clients (Behn, Carcello, Hermanson, and Hermanson 1997; McCracken, Salterio, and Gibbins 2008).1 Further, while accounting firms seek to employ and retain “proactive leaders” and auditors who are “proactive by nature,” auditors often struggle to behave proactively.2 For example, auditors regularly struggle to modify

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1 To corroborate this, we informally interviewed nine current and former audit partners and senior managers who confirmed that various proactive behaviors are highly valued by audit firms and improve audit quality.
2 These quotes were obtained from Deloitte’s website and KPMG’s website, respectively, on December 9, 2017.
the audit plan effectively to address identified risks (Hammersley, Johnstone, and Kadous 2011; PCAOB 2017), fail to coordinate effectively with clients (Barr and McNeilly 2003), and may lack the motivation to coach junior auditors (Andiola et al. 2018). Together, this suggests that scientific evidence on determinants of proactive auditing behaviors should be of interest to academics, practitioners, and standard setters.

To provide such evidence, we draw on prior literature on employee proactivity, auditor tacit knowledge, and regulatory focus theory to develop and test hypotheses in an experiment. Our experiment examines whether there are common conditions that influence auditors’ propensity to engage in a range of proactive behaviors related to evidence evaluation, coordinating with clients, and coaching subordinates. These behaviors are distinct and thus far have been examined in separate streams of the auditing literature. However, we theorize that these distinct behaviors have something in common (i.e., proactivity), and ask the following research question: Does autonomy interact with auditors’ tacit knowledge and regulatory focus to influence auditors’ propensity to engage in a range of proactive behaviors?

Autonomy is a feature of the work environment that provides employees with freedom, opportunity, and discretion to make work-related decisions (Morgeson and Humphrey 2006); it causes employees to feel like they can take action. Prior studies provide evidence of a main effect of autonomy on employee proactivity, but in settings that are vastly different from auditing.\(^3\) We expect that autonomy alone is unlikely to encourage proactivity among auditors for two reasons. First, due to the complexity of auditing, decisions as to when and how to behave proactively are not necessarily obvious—they likely improve when auditors possess greater tacit

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\(^3\) The industries and the skill-sets needed to act proactively examined in prior research are distinct from the audit setting. For example, prior studies have examined employee proactivity in glass, automobile, and beverage manufacturers (Parker, Wall, and Jackson. 1997, Parker 1998, Axtell et al. 2000, Axtell and Parker 2008) and have focused on samples of employees with a wide variety of skill-sets (Frese, Garst, and Fay 2007; Morrison 2006).
knowledge. Tacit knowledge captures differences in auditors’ knowledge about how to manage themselves and others when performing socially interactive tasks (Tan and Libby 1997; Bol et al. 2018). We expect autonomy to increase proactivity to a larger extent when auditors have higher tacit knowledge than when they have lower tacit knowledge.

Second, the potential costs of proactive behaviors are likely quite salient to auditors because these costs (e.g., extra time/effort, uncertain outcomes) often conflict with auditors’ incentives to complete work efficiently and under budget (e.g., Brazel, Jackson, Schaefer, and Stewart 2016). By contrast, the beneficial reasons why auditors should behave proactively are likely less salient to auditors. This asymmetry in salience of costs versus benefits of auditor proactivity highlights the applicability of regulatory focus theory (Crowe and Higgins 1997). This theory distinguishes between a promotion focus (i.e., a focus on achieving positive outcomes) and a prevention focus (i.e., a focus on avoiding negative outcomes). We expect autonomy to increase proactivity to a larger extent when auditors have a promotion focus than when they have a prevention focus. Finally, taken together, our theory also implies that autonomy will be most effective at encouraging proactivity when auditors have both higher tacit knowledge and a promotion focus.

To test our hypotheses, we perform a $2 \times 2 \times 2$ between-participants experiment. We manipulate autonomy (lower versus higher), measure tacit knowledge (lower versus higher), and manipulate regulatory focus (prevention-focused versus promotion-focused). Participating audit seniors completed a case in which they reviewed a staff auditor’s work and began preparing the staff auditor for an upcoming task. We seed in the case four opportunities for auditors to be proactive. Specifically, seeded cues suggest that auditors could choose to follow-up about a potential issue that was not directly related to the task at hand, coordinate with the client
regarding the provision of evidence, keep the staff up-to-date on client accounting policy changes, and take the time to coach the staff on the broader importance of their work. After encountering the seeded cues, auditors responded to open-ended questions by describing what they wanted to do next. We measure the number of proactive behaviors auditors describe. Post-experimental questions validate that auditors perceive the seeded actions as proactive.

Our results support our expectations and provide evidence of a three-way interaction. Specifically, we find that higher tacit knowledge amplifies the positive effect of autonomy on proactivity, but only among auditors with a promotion focus. We also find that a promotion focus amplifies the positive effect of autonomy on proactivity, but only among auditors with higher tacit knowledge. Stated differently, we find that autonomy increases proactivity but only when auditors have both higher tacit knowledge and a promotion focus. In supplemental analyses, we validate that our results are directionally consistent for each of the distinct proactive behaviors included in our measure. We also triangulate our theory by showing that replacing our manipulated regulatory focus variable with a measure capturing auditors’ focus on achieving benefits versus avoiding costs of proactivity produces similar results. Finally, we show that our independent variables promote proactive, but not unwarranted, behaviors.

Our study contributes to theory and practice. First, while proactive behaviors improve audit quality, evidence on how audit firms can encourage these behaviors is scarce. Prior auditing research has examined behaviors that contain elements of proactivity. For example, researchers have identified factors that cause auditors to modify audit programs in response to new information (Asare and Wright 2004; Bauer, Hillison, Peecher, and Pomeroy 2018; Hammersley and Ricci 2018), speak up about potential audit issues (e.g., Nelson et al. 2016; Kadous, Proell, Rich, and Zhou 2018), and coach junior auditors (e.g., Andioloa et al. 2018).
Importantly, these behaviors represent different facets of audit quality (PCAOB 2015, CAQ 2019) and the antecedents of these behaviors are typically assumed to be different. In contrast, we propose that these distinct behaviors overlap, at least in part, with a broader construct, proactivity. Thus, we include a range of distinct behaviors in our measure of proactivity. Since proactive behaviors must be self-starting (Parker et al. 2010), our measure also ensures that auditors describe proactive behaviors on their own volition (i.e., without being asked about the behaviors). Using this approach, we identify common conditions that influence auditors’ propensity to engage in proactive behaviors and show that each behavior included in our measure responds similarly to the proposed antecedents of proactivity.⁴ Thus, our study introduces the proactivity construct to the auditing literature and develops theory about conditions collectively sufficient to encourage a range of quality-enhancing proactive behaviors related to evidence interpretation, client coordination, and coaching.

Second, we highlight a potential cost of restricting auditors’ autonomy—reduced proactivity by auditors with higher tacit knowledge and a promotion focus. Understanding costs and benefits of restricting auditors’ autonomy is relevant to practice because it helps inform discussions about the deployment and refinement of audit technologies, such as audit programs and decision aids, that impose structure on audit tasks (Dowling and Leech 2007; Hammersley and Ricci 2018; Boland, Daugherty, and Dickins 2019). Further, there is likely variability in the autonomy afforded to auditors due to differences in leadership styles, team culture, and client characteristics. Although we avoid making prescriptive recommendations to practice based on

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⁴ Similarly, management researchers have started to bring together distinct behavioral phenomena, typically studied separately, under the proactivity umbrella. While unique behaviors naturally have unique antecedents, there is also value in examining common factors that drive a range of different behaviors as it allows scholars to understand both the “specific manifestations and the general phenomenon of proactivity” (Grant and Ashford 2008, 5).
our study alone, firms could consider the desirability of cultural changes or leadership styles that foster more autonomous work environments (Gagné and Deci 2005).

Third, our study extends prior research on auditors’ tacit knowledge and regulatory focus. Prior studies demonstrate that higher tacit knowledge auditors are rewarded in the performance evaluation process (Tan and Libby 1997), beginning relatively early in their careers (Bol et al. 2018), but these studies do not identify specific dimensions of audit task performance that tacit knowledge helps improve. By linking tacit knowledge to proactivity, our study highlights the importance of retaining and training higher tacit knowledge auditors in practice. Further, our study is among the first to link regulatory focus theory to audit outcomes. Specifically, our paper complements recent work linking regulatory focus to the advice auditors provide to peer auditors (Knechel and Leiby 2016) and to the provision of value added services (Mullis 2018).

Fourth, prior management studies typically use data from surveys and interviews to examine associations between employees’ perceptions of their work environments and self- or supervisor- reported behaviors (see Grant and Ashford 2008 and Parker et al. 2010 for reviews). Since these studies typically focus on main effects, there is a priori tension in whether the variables explored in our study will interact as predicted. Despite this tension, our experiment provides evidence about how these variables jointly influence proactivity in the audit environment; we find that higher tacit knowledge and a promotion focus are collectively sufficient for autonomy to encourage auditor proactivity. Thus, we contribute to the broader literature on proactive behaviors.

**THEORY AND HYPOTHESIS DEVELOPMENT**

Proactive behaviors are “anticipatory actions that employees take to impact themselves and/or their environments” (Grant and Ashford 2008, 4). Proactive behaviors share three key
attributes: (1) self-starting – the individual must act on their own volition, rather than on a directive from someone else, (2) change oriented – the individual must focus on meaningfully altering the self, others, or the environment, and (3) future focused – the behavior must occur in advance of an anticipated future (Parker et al. 2010). Proactive behaviors that have been studied in the management literature include adapting to new environments, actively seeking feedback, taking charge, revising tasks, and speaking up (Grant and Ashford 2008).

Many auditing behaviors that have received attention from regulators, practitioners, and researchers contain an element of proactivity, or its absence. For example, regulators have raised concerns about auditors’ unresponsiveness when they encounter new information that implies a need to revise prior risk assessments (PCAOB 2017). These situations require auditors to think proactively about how the new information could impact risk assessments and related audit procedures. Auditors then need to speak up or modify the audit program, even if the new information is not directly related to the task at hand. Additionally, practitioners and researchers have emphasized the importance of effective coordination with clients (Guénin-Paracini et al. 2015) and on-the-job coaching (Westermann et al. 2015; Andiola et al. 2018) for achieving quality audits. On-the-job coaching improves audit outcomes because it helps enhance auditors’ knowledge, but auditors report that they often skip thorough coaching efforts (Westermann et al. 2015). Coordinating with clients can also improve audit outcomes because client managers provide evidence to auditors in a more timely fashion, and are more forthcoming with evidence, when auditors make professional requests that are sensitive to client schedules (Guénin-Paracini et al. 2015; Saiewitz and Kida 2018; Hatfield, Hoang, Ricci, and Thomas 2019). Importantly, all of the actions discussed above require auditors to proactively invest time and resources in the present in order to achieve better outcomes in the future. Given that proactivity is a central
feature of many behaviors that are critical for high quality audits, we next examine the joint effects of factors that have the potential to promote proactivity.\(^5\)

**Autonomy: Auditors Who Feel They Can Take Opportunities to Act**

Autonomy is “the extent to which a job allows freedom, independence, and discretion to schedule work, make decisions, and choose the methods to perform tasks” (Morgeson and Humphrey 2006, 1323). Autonomy is a focal point of the management literature on proactivity and has generally been shown to be positively associated with employee proactivity (Crant 2000; Parker, Williams, and Tuner 2006; Grant and Ashford 2008; Parker et al. 2010). Audit firms and teams likely have discretion over the autonomy they afford to their employees. For example, firms can design management strategies that increase employees’ perceptions of autonomy (Chen, Lill, and Vance 2019) or foster a culture that emphasizes the autonomy of team members (Kirkman and Rosen 1999). For these reasons, autonomy is the focal point of our theory.

Prior management research demonstrates that autonomy is associated with employees’ perceptions of their capability to be proactive (Parker 1998; Axtell and Parker 2003) and self-reports of proactive behaviors (Axtell et al. 2000; Frese et al. 2007). Further, theory suggests that autonomy encourages proactivity by causing employees to feel like they can take opportunities to act. Autonomy induces feelings of responsibility and control (Morrison 2006) and signals to employees that they have the discretion to take initiative (Grant and Ashford 2008).

While prior management studies generally provide evidence that autonomy is associated with employee proactivity, there are two reasons to doubt that autonomy alone will encourage proactive auditing behaviors. First, auditing is complex and each audit is unique (Bell, Peecher, 5 Naturally, some forms of proactivity can be directed against the best interests of organizations (Frese, Garst, and Fay 2007) and there are likely proactive auditing behaviors that work against audit quality and efficiency. In this study, we focus on proactive behaviors that can positively impact audit quality.
and Solmon 2005; Knechel et al. 2013), suggesting that auditors in particular might struggle to identify potential proactive behaviors or to properly perform proactive behaviors once identified. Second, auditors have incentives to be efficient, suggesting that auditors may struggle to see the reasons why they should choose to pursue proactive behaviors that require extra time and are often not explicitly required by their ordinary job responsibilities.

The management literature also hints at the possibility of unexplored boundary conditions. For example, Fuller, Marler, and Hester (2006) and Rank, Carsten, Unger, and Spector (2007) fail to find an effect of autonomy on employee proactive behavior. Although it is impossible to diagnose the precise reason(s) for these null results, they support our view that autonomy alone does not always promote proactivity. Further, Morrison (2006) provides experimental evidence of a main effect of autonomy on proactivity, but in a setting distinct from ours, where the researcher provided participants with both a proactive behavior to consider (i.e., circumventing a formal company policy) and the reasons why they might want to perform the behavior (i.e., it would be good for the customer and possibly for the company). Thus, the limited existing experimental work on autonomy and employee proactivity leaves open the possibility that knowledge about how to be proactive and salient reasons why it is important to act can amplify the effects of autonomy on proactivity. In the following sections, we argue that while autonomy should make auditors feel like they can take action, it will have limited effects on auditor proactivity unless auditors also know when and how to act and focus on the reasons why they should take action.

The Moderating Role of Tacit Knowledge: Auditors Who Know When and How to Act

Auditing tasks are often complex and socially demanding (Peecher et al. 2013; Bol et al. 2018). Behaving proactively involves navigating the audit environment on one’s own volition,
without explicit directives about what to do (Parker et al. 2010). Thus, while autonomy causes people to feel they can behave proactively, it will likely have limited effects on auditors’ behavior unless auditors are also skilled at identifying (a) opportunities to be proactive and (b) appropriate proactive responses to these opportunities.

Importantly, knowledge about when and how to behave proactively is likely tacit (Grant and Ashford 2008). Unlike technical knowledge, tacit knowledge is gleaned from experience rather than taught directly (Wagner and Sternberg 1985). It involves general knowledge about how to manage oneself (e.g., how to organize one’s own activities), others (e.g., how to interact with others effectively), and tasks (e.g., how to perform tasks well in socially interactive environments) (Wagner and Sternberg 1987). Proactive auditing behaviors are self-starting, often have interpersonal dependencies, and involve completing domain-specific tasks. Thus, while tacit knowledge represents broad knowledge of how to handle socially demanding tasks and has not been linked to proactivity in prior work, we expect that tacit knowledge captures, in part, auditors’ knowledge about when and how to behave proactively.

Prior auditing research implies that there is significant variation in auditors’ tacit knowledge (Tan and Libby 1997; Bol et al. 2018). Tacit knowledge is positively associated with the performance evaluations of managers (Tan and Libby 1997) and, more recently, the career outcomes of less experienced auditors (Bol et al. 2018). Together with our prior discussion, this suggests that there is variation in the extent to which auditors are knowledgeable about when and how to act proactively. Therefore, the freedom and discretion afforded to auditors by higher autonomy will likely be more effective in promoting proactivity when auditors also have higher tacit knowledge. We predict that autonomy and tacit knowledge will interact such that:

**H1**: Autonomy will increase auditor proactivity to a larger extent when auditors have higher tacit knowledge compared to when they have lower tacit knowledge.
The Moderating Role of Regulatory Focus: Auditors Who Focus on Why to Act

Auditors work under time-budget constraints (Lambert, Jones, Brazel, and Showalter 2017; Bennett and Hatfield 2017) and behaving proactively often involves an incremental investment of resources (e.g., time, energy, attention), which is not necessarily linked to immediate rewards. Thus, even when autonomy causes people to feel they can behave proactively, it will likely have limited effects unless auditors also have salient reasons why they should behave proactively. Specifically, auditors may pass up opportunities to behave proactively because investing extra time on audit tasks can impair auditors’ performance evaluations due to budget overruns or because there is uncertainty associated with behaving proactively due to the complexity of audit tasks. For example, collecting additional evidence to resolve misstatement risk can lead to lower performance evaluation, especially if the additional investigation does not ultimately identify a misstatement (Brazel et al. 2016).

Drawing on regulatory focus theory, we propose that focusing auditors on the possibility of achieving positive outcomes, rather than avoiding negative outcomes, can increase the salience of the reasons why they should perform proactive behaviors they might be considering. People’s regulatory focus concerns their motivation toward desired goals (Higgins 1997) and is influenced by both trait differences and contextual factors (Higgins 2000). Theory distinguishes between motivation to achieve positive outcomes (i.e., a promotion focus) and motivation to avoid negative outcomes (i.e., a prevention focus) (Crowe and Higgins 1997). Promotion-focused individuals strive toward maximal goals and are motivated to go above and beyond the status quo to attain the benefits of positive outcomes, whereas prevention-focused individuals strive toward minimal goals and are motivated to maintain the status quo to avoid the costs of negative outcomes (Higgins 1997; Higgins and Cornwell 2016).
More proactive behaviors generally involve going above and beyond explicit directives associated with a task and striving toward maximal goals. Consistent with this, association studies show that promotion focused individuals and those with maximal goals tend to be more proactive than prevention focused individuals and those with minimal goals (Iyengar, Wells, and Schwartz 2006; Neubert et al. 2008). We expect auditors with a promotion focus, who focus more on achieving positive job outcomes, will experience more motivation when considering potential proactive behaviors, than auditors with a prevention focus, who focus more on avoiding negative job outcomes. Thus, a promotion focus should complement the freedom and discretion afforded to auditors with more autonomy. While autonomy should cause auditors to feel like they can act, a promotion focus should help highlight why auditors should act. We predict that autonomy and regulatory focus will interact such that:

**H2:** Autonomy will increase auditor proactivity to a larger extent when auditors have a promotion focus compared to when they have a prevention focus.

To summarize, our first and second hypotheses predict that higher tacit knowledge and a promotion focus will amplify the positive effect of autonomy on proactivity, respectively. Further, since tacit knowledge should help auditors overcome uncertainty about when and how to be proactive and a promotion focus should help auditors overcome a focus on the reasons why they might want to avoid proactivity, our theory implies that autonomy will be most effective at encouraging proactivity when auditors have both higher tacit knowledge and a promotion focus.

**RESEARCH METHOD**

We perform a $2 \times 2 \times 2$ between-participants experiment. We manipulate autonomy (lower versus higher) and regulatory focus (prevention-focused versus promotion-focused), and we measure tacit knowledge (lower versus higher). We examine how these independent variables affect auditors’ proactivity. Participants are auditors from eight firms, including each of the Big 4
firms. We obtained 157 usable responses from 155 seniors, one recently promoted manager, and one participant who did not report their title.\textsuperscript{6,7} Average experience is 40 months, with a range of 14 to 94 months. Seniors participants are appropriate because they are typically responsible for the proactive behaviors of interest (i.e., responding to unexpected risks, client coordination, and staff development; Hammersley et al. 2011; Westermann et al. 2015).

**Task**

Participating auditors completed an online case in which they reviewed a staff auditor’s work and began preparing the staff auditor for an upcoming task. The case began with background information about an electronics-manufacturer client and the audit engagement team. The engagement team was ostensibly finishing interim substantive testing of revenue and preparing for year-end accounts receivable testing. Following the manipulations, auditors performed a series of two tasks in which there were seeded opportunities for them to be proactive. Auditors’ first task was to review a staff auditor’s interim revenue transaction testing. Importantly, for some sample items, the staff was unable to obtain the purchase order from the client but was able to confirm the sale directly with the customer. Thus, while the missing purchase order is not an issue for the substantive testing, it represents a control issue that has implications for the team’s interim controls testing, which was previously completed without any noted exceptions. Specifically, the missing purchase orders suggest that multiple controls discussed in the background section (e.g., three-way match) are unlikely to be operating effectively. The purpose of this task is to seed an opportunity for auditors to proactively consider

\textsuperscript{6} The link to our study was opened 221 times and 157 auditors finished the study in one sitting without skipping over the main task of describing what they wanted to do next in response to the case materials.

\textsuperscript{7} Our inferences do not change if we exclude the two participants who did not report that they are audit seniors.
the implications of revenue substantive testing for the operating effectiveness of controls and to follow-up by speaking up or proposing changes to the audit plan.

Auditors’ second task was to begin preparing the staff auditor for year-end testing over accounts receivable. The staff was going to be responsible for overseeing the AR confirmation process and helping the senior test the AR reserve by completing a workpaper designed to evaluate the reasonableness of the reserve based on the company’s aging policy. The purpose of this task is to seed three additional opportunities for auditors to be proactive. First, auditors were told that client management is known for getting frustrated by last minute documentation requests and has a narrow window of availability, thus seeding an opportunity for auditors to proactively coordinate the confirmations with the client (e.g., prioritizing the confirmation sample selections). Second, auditors were told that the client changed its AR aging policy in the current year, seeding an opportunity for auditors to proactively keep the staff up-to-date on these changes and how they impact the current year AR reserve workpaper. Third, auditors were told that the staff auditor is inexperienced with AR, seeding an opportunity for auditors to invest in the staff’s professional development (e.g., by explaining the broader purpose of auditing AR).

Taken together, the case included four seeded opportunities for auditors to be proactive. Auditors had an opportunity to: (1) Follow-up about the control issue (2) Coordinate with the client regarding confirmations (3) Keep the staff up-to-date about changes in the client’s AR aging policy and (4) Invest in the staff’s professional development. Importantly, auditors did not receive a directive to perform any of these actions, all of which have the potential to change future audit outcomes. Therefore, these actions contain the attributes of proactive behaviors – they are self-starting, change-oriented, and future focused (Parker et al. 2010). Additionally, the audit partners and senior managers we interviewed informally indicated that these actions are
proactive and valuable for audit quality. Finally, as reported in our results section, post-experimental questions validate that auditors perceive these actions as proactive.

After encountering the four seeded opportunities, auditors described what they would do next. Then, auditors completed a post-experimental questionnaire containing manipulation checks and demographic questions. Finally, auditors responded to several items designed to measure their tacit knowledge.

**Independent Variables**

We manipulate autonomy and regulatory focus between-participants and measure tacit knowledge. We manipulate autonomy (lower versus higher) using a multi-faceted approach. First, drawing on Morrison’s (2006) manipulation and language used in measures of autonomy (c.f. Morgeson and Humphrey 2006; Rank et al. 2007), we describe the degree to which the team’s culture is autonomous. Participants in the lower (higher) autonomy condition are told:

Relative to other audit engagements, you have never (always) felt like you have much (a lot of) freedom and discretion to make decisions regarding your work on the Northwest engagement. Members of the audit team are generally encouraged to follow directions (make decisions independently). That is, team members are encouraged to rely on team leaders (their own judgment) to determine how various tasks should be prioritized, performed, and completed.

Second, we vary the language used throughout the case to be consistent with our description of the culture. For example, similar to Sheldon et al. (2018), lower autonomy participants are told that their manager directs them to begin reviewing the staff’s work while higher autonomy participants are told that they choose to review the staff’s work. Third, inspired by prior studies that provide participants with the illusion of choice (Finkelstein and Fishbach 2010), we provide participants in the higher autonomy condition with an opportunity to make a decision that is peripheral to the content of the case, while this decision was made at random on behalf of participants in the lower autonomy condition. Specifically, we ask higher autonomy
participants to choose whether to check-in with a staff auditor named Alex or Sam first. In contrast, we tell lower autonomy participants that their manager had them check in with Alex or Sam first. Regardless of who participants choose to or are assigned to check-in with first, Alex is always close to wrapped up and Sam’s testing is always far from complete. Thus, the remainder of the task always focuses on reviewing Alex’s work and preparing Alex for an upcoming task.

We manipulate regulatory focus by asking auditors in the prevention-focused (promotion-focused) condition to list three negative (positive) outcomes of poor (excellent) job performance that auditors have incentive to avoid (achieve). We adapt the manipulation from prior regulatory focus studies (e.g., Freitas, Liberman, Salovey, and Higgins 2002) by tailoring it to the audit context. We position this question after the client background but before auditors encountered the seeded opportunities to be proactive. The manipulation should cause auditors to think broadly about general positive or negative job outcomes. We expect that auditors who focus on general positive (negative) job outcomes will then be more likely to think about the specific benefits (costs) of being proactive in the subsequent task, if the possibility of being proactive comes to mind. This manipulation also allows us to hold auditors’ incentives constant and varies only auditors’ focus on achieving positive outcomes versus avoiding negative outcomes.

Finally, we measure auditors’ tacit knowledge at the end of the post-experimental questionnaire. We draw on Bol et al.’s (2018) approach to measuring tacit knowledge by using

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8 About half of participants in the higher autonomy condition (53%) chose to check-in with Alex first and, by design, about half of participants in the lower autonomy condition (49%) were assigned to check-in with Alex first. Thus, there are no differences across conditions in who participants checked-in with first (p = 0.689)
five of the 10 questions in Bol et al. (2018) to measure tacit knowledge. Each question represents a work-related scenario and, for each scenario, participants rate the importance or the quality of various behaviors. For example, in one question, participants rate the importance of different factors such as critical thinking ability and speaking ability in establishing a good reputation in public accounting firms. Following Bol et al. (2018), we compute each auditors’ tacit knowledge score by first calculating the sum of the squared deviations between the auditor’s ratings and the mean ratings of the expert panel for each behavior used in Bol et al. (2018). We then reverse rank the raw score, so that a higher value indicates higher tacit knowledge. For ease of analysis, we conduct a median split on auditors’ tacit knowledge scores, separating lower tacit knowledge auditors from higher tacit knowledge auditors.

**Dependent Variables**

After reviewing the staff auditors’ interim revenue transaction testing and learning about the staff’s upcoming task (and, thus, encountering the seeded opportunities to be proactive), auditors indicated what they wanted to do next by selecting from a list of actions including: (1) Sign-off on the staff’s interim revenue transaction testing workpaper, (2) Ask the staff to roll forward the prior year AR allowance workpaper, (3) Provide review notes on the staff’s interim

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9 Bol et al. (2018) use 10 questions to measure tacit knowledge, with five questions adopted from Tan and Libby’s (1997) 10-question scale and five questions developed by Bol, Estep, and Peecher (2015). Due to the time constraints of our participants, we select five of the ten questions from Bol et al. (2018), including questions three and eight from Tan and Libby’s (1997) Tacit Knowledge Scale and questions three, four, and five from Bol et al.’s (2015) measurement instrument (see Appendices A and B of Bol et al. [2018] for a description of these items). We ensured that the questions we chose included a variety of different scenarios and that the scenarios were well suited for senior auditor respondents. Our approach is supported by the following: (1) Bol et al. (2018) show that scores from the five questions they adopted form Tan and Libby (1997) are highly correlated with scores from the five questions developed by Bol et al. (2015), suggesting that it is reasonable to adopt a mix of questions from both sources; (2) Factor analysis of our five questions identifies a single factor with an eigenvalue greater than 1.00, indicating that our five questions capture the same underlying construct; and (3) Bol et al. (2018) observe similar results when using the five items they adopted from Tan and Libby’s (1997)’s tacit knowledge scale and when using the five-item Bol et al. (2015) measurement instrument, suggesting that five items is sufficient to measure tacit knowledge.

10 Following Bol et al. (2018), we only include those behavior items where there is consensus among the expert panel (i.e., items whose expert rating ranges are five or less).
revenue transaction testing workpaper, (4) Provide instructions to the staff before he starts to work on year-end AR confirmations, (5) Provide instructions to the staff before he starts to roll forward the prior year AR allowance workpaper, (6) Talk to my Manager, (7) Talk to the Controller, (8) Perform an action that is not listed. Selecting options three through eight is necessary, but not sufficient, for auditors to demonstrate proactive behavior. The purpose of these options was to elicit a detailed discussion of what auditors wanted to do next, allowing auditors to describe proactive behaviors on their own volition (i.e., without asking them about the seeded proactive behaviors). Since proactive individuals must act on their own volition (Parker et al. 2010), it is important that auditors themselves describe the proactive behaviors. Thus, if auditors selected options three through eight, we asked them open-ended questions about what specifically they wanted to do. For example, if auditors selected the third option (“Provide review notes”), we ask them what review notes they would like to provide. Auditors repeated the process of selecting actions and providing details until they indicated they were ready to move on to the next part of the study.

We aggregate all of auditors’ open-ended responses and code them to determine if auditors’ described behaviors are responsive to the seeded opportunities to be proactive. Specifically, we divide auditors’ responses into thought units and code each item into six categories: (1) Control Issue Follow-up (2) Coordinating Confirmations (3) Keeping Staff Up-to-Date (4) Professional Development (5) Other Valid Behaviors and (6) Invalid Behaviors. We include items in categories one through four if they describe behaviors that are responsive to

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11 Selecting the first or second action does not represent proactive behavior. Thus, if auditors selected the first or second action, we did not ask them any open-ended questions. If auditors selected the first action (sign-off on the staff’s interim revenue testing), we told them that they had signed off on the workpaper. Only 16 of 157 auditors (10%) signed-off without providing review notes on the workpaper. If auditors selected the second action (ask the staff to roll forward the prior year workpaper), we told them that the staff was now performing year-end AR testing based on the prior year workpaper. Only 9 of 157 auditors (6%) asked the staff to rollforward the workpaper without providing instructions to the staff before the staff starts.
each of the four seeded opportunities to be proactive. We include items in category five if they are relevant to the case tasks, but are not responsive to the seeded opportunities to be proactive. We include items in category six if they are irrelevant to the case tasks, uninterpretable, or too general to convey any meaningful information. Coding was performed independently by an author and a research assistant, both of whom were blind to experimental condition. The coder’s initial agreement rate was 90.56% and Cohen’s Kappa is 0.85, which is indicative of very strong agreement (Landis and Koch 1977). The coders discussed the items on which they disagreed and made a joint decision on the final coding for these items. We use the final coding in our analyses.

We construct four binary variables indicating whether or not participants explain that they want to perform each of the seeded proactive behaviors: Control Issue Follow-up, Coordinate with Client, Keep Staff Up-to-Date, and Professional Development. For example, Control Issue-Follow up indicates whether participants’ responses include at least one item that is responsive to the seeded opportunity to follow-up about the control issues. Our primary dependent variable, Total Proactive Behaviors, is the sum of these four variables.

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12 Examples of Control Issue Follow-up include “…this potentially could be a control issue that might cause additional substantive selections” and “…he should be aware of the control errors noted in testing.” Examples of Coordinate with Client include “We should prioritize this task because the preparation of the confirmations requires coordination with [the Controller], who has availability now but not next week” and “I need you to…begin drafting the confirmation letters immediately.” Examples of Keep Staff Up-to-Date include “…remind him that he’ll have to update the workpaper to reflect those changes” and “Let him know they are changing how the calculate their ADA balance; give him the reasons provided by [the Controller].” Examples of Professional Development include “Explain the purpose of the workpaper and what the workpaper is attempting to accomplish” and “I would discuss the audit methodology and reasoning for AR confirmations…I would explain the assertions that relate to this procedure and why it is important.”

13 Many Other Valid Behaviors appear to lack proactivity (e.g., documentation suggestions such as “Let’s add the shipping date as well here so that we can document that cutoff is appropriate.”). Some Other Valid Behaviors might be considered proactive (e.g., “I would look to bi-furcate the population to capture customers across different aging buckets…to ensure our 20 selections capture the changes [in customer base].”). However, determining whether these behaviors are proactive ex-post can be subjective. Rather than attempting to do so, we focus on analyzing the seeded proactive behaviors that we identified ex-ante.

14 Examples of Invalid Behaviors include “use confirms” and “no specific notes jump out to me as being needed.”

15 We construct binary measures rather than a count of items coded into each category. When the count exceeds one, the participant is often describing the same behavior multiple times.
RESULTS

Validating the Proactivity of Seeded Behaviors

In the post-experimental questionnaire, we ask participants to assess the proactivity of four behaviors on 11-point Likert scales, ranging from 0 (not at all proactive) to 10 (extremely proactive). Three of the four behaviors are seeded proactive behaviors and the fourth is a benchmark behavior. Auditors assessed the proactivity of considering the implications of one audit test’s results for other audit areas (which maps to our Control Issue Follow-up behavior), prioritizing sample selections to give the client lead time (which maps to our Coordinate with Client behavior), and spending time to coach staff (which maps to our Keeping Staff Up-to-Date and Professional Development behaviors). We also include one benchmark behavior (“follow your manager’s guidance for reviewing staff’s workpapers”) that is part of auditors’ ordinary job responsibilities and, thus, is not considered proactive. Auditors perceive the proactivity of considering the implications of one audit test’s results for other audit areas ($M = 8.01$), prioritizing sample selections to give the client lead time ($M = 8.52$), and spending time to coach staff ($M = 8.18$) significantly higher than the benchmark behavior ($M = 4.94$) (all $p$-values $< 0.01$). In addition, the three seeded proactive behaviors are all rated significantly higher than the midpoint of the scale (i.e., “moderately proactive”) (all $p$-values $< 0.01$), while the benchmark behavior is not significantly different from the midpoint ($p = 0.78$). These results corroborate our discussions with audit practitioners, who indicated that our seeded behaviors are more proactive than behaviors required by auditors’ ordinary job responsibilities.

Autonomy Manipulation Check

Participants rated their agreement with statements that their supervisors on the engagement provided them with freedom to make decisions about 1) “the order in which I did
things” and 2) “how to go about getting my job done” on 11-point Likert scales ranging from 0 (strong disagree) to 10 (strongly agree). Auditors’ ratings indicate significantly higher freedom to make decisions in the higher autonomy condition ($M = 8.56$ and $8.19$, respectively) than in the lower autonomy condition ($M = 6.80$ and $6.80$, respectively, $p < 0.01$ for both questions). Thus, we conclude that our autonomy manipulation is successful.\(^\text{16}\)

**Tests of Hypotheses**

Our hypotheses predict that autonomy will encourage proactivity to a larger extent when auditors have higher tacit knowledge than when they have lower tacit knowledge (H1) and that autonomy will encourage proactivity to a larger extent when auditors have a promotion focus than when they have a prevention focus (H2). We test these hypotheses using a three-way ANOVA with autonomy, tacit knowledge, and regulatory focus as independent variables and *Total Proactive Behaviors* as the dependent variable.\(^\text{17}\) Table 1 provides descriptive statistics (Panel A), the ANOVA (Panel B), and tests of hypotheses (Panel C). Figure 1 plots the means.

![Insert Table 1 and Figure 1 here]

Planned contrasts based on the ANOVA (Panel C) show that, consistent with H1, autonomy encourages proactivity to a larger extent when auditors have higher tacit knowledge than when they have lower tacit knowledge ($p = 0.05$). However, inconsistent with H2, autonomy does not encourage proactivity to a larger extent when auditors have a promotion focus compared to when auditors have a prevention focus ($p = 0.40$).

\(^{16}\) We did not expect a traditional manipulation check question to be helpful in validating the success of the regulatory focus manipulation because people are not typically aware of their regulatory focus or its impact on their cognition or behavior (Bargh and Chartrand 2000). Instead, as discussed in supplemental analyses, we (1) validate that auditors followed instructions for the regulatory focus prompt (2) triangulate our theory about regulatory focus.

\(^{17}\) Total proactive behaviors range from zero to four. The mean (median) is 1.50 (2.00) and the standard deviation is 1.04. Since this variable is quasi-continuous and visual inspection of a quantile-quantile plot supports the normality assumption, this variable can be analyzed using ANOVA. Further, ANOVA is typically robust to the normality assumption (Oehlert 2000). We also verify that our main results are similar using an ordinal logistic model, which provides evidence of a three-way interaction between autonomy, tacit knowledge, and regulatory focus ($p = 0.04$).
While our initial test of H2 is insignificant, the insignificant two-way interaction is qualified by a marginally significant three-way interaction ($p = 0.09$, Panel B). We probe this three-way interaction by conducting separate regulatory focus by autonomy ANOVAs for each level of tacit knowledge. Untabulated analyses show that H2 holds for higher tacit knowledge auditors. For higher tacit knowledge auditors, there is a marginally significant interaction ($t_{76} = 1.54$, $p = 0.06$ based on planned contrast), such that autonomy has a larger impact on proactivity for promotion-focused auditors than for prevention-focused auditors. However, H2 does not hold for lower tacit knowledge auditors. For lower tacit knowledge auditors, a promotion focus does not amplify the effect of autonomy on proactivity ($t_{73} = 0.96$, $p = 0.83$ based on planned contrast).\(^\text{18}\) Thus, H2 is supported, but only among auditors who have higher tacit knowledge.

Similarly, while our initial test of H1 is significant, this result is qualified by the three-way interaction. Untabulated analyses show that H1 holds for auditors with a promotion focus. For promotion-focused auditors, there is a significant interaction ($t_{75} = 2.44$, $p = 0.01$ based on planned contrast), such that autonomy has a larger impact on proactivity for auditors with higher tacit knowledge than for auditors with lower tacit knowledge. However, H1 does not hold for auditors with a prevention focus. For prevention-focused auditors, higher tacit knowledge does not amplify the effect of autonomy on proactivity ($t_{74} = 0.03$, $p = 0.51$ based on planned contrast).\(^\text{19}\) Thus, H1 only holds within the promotion focus condition.\(^\text{20}\)

Taken together, consistent with our theory and as the means plot suggests, autonomy, tacit knowledge, and regulatory focus jointly affect auditor proactivity. Our evidence suggests

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\(^{18}\) Further, for lower tacit knowledge auditors, there are no significant main effects (both $p$-values > 0.10).

\(^{19}\) Further, for prevention-focused auditors, there are no significant main effects (both $p$-values > 0.10).

\(^{20}\) Inferences are similar if we use a continuous measure of tacit knowledge to test H1. For promotion-focused auditors, an untabulated linear regression model provides evidence of an autonomy by tacit knowledge interaction ($p = 0.089$ two-tailed), the shape of which is consistent with our theory. For prevention-focused auditors, an untabulated linear regression model does not provide evidence of this interaction ($p = 0.902$ two-tailed).
that autonomy has a positive effect on proactivity, but only when auditors have both higher tacit knowledge and a promotion focus (Figure 1). Further corroborating this conclusion, ex-post analysis shows that auditors with higher autonomy, higher tacit knowledge, and a promotion focus are more proactive (mean proactive behaviors = 2.00) than auditors in all other conditions (mean proactive behaviors = 1.42, \( t_{155} = 2.43, p = 0.02 \)).

**Supplemental Analyses**

*Alternative Test of Hypotheses Based on Measured Regulatory Focus*

We manipulate auditors’ regulatory focus by asking auditors to list general positive or negative job outcomes, which is expected to change auditors’ focus on achieving benefits versus avoiding costs of proactive behaviors in the subsequent task. While the extent to which individuals are promotion or prevention focused depends on situational factors, such as our manipulation, there are also individual differences in people’s focus on avoiding negative outcomes versus achieving positive outcomes (e.g., Crowe and Higgins 1997; Higgins et al. 2001; Lockwood, Jordan, and Kunda 2002). For example, differences in auditors’ traits and prior work experience (e.g., prior outcomes of pursuing proactive behaviors) likely influence the salience of the benefits and costs of being proactive. Thus, auditors’ focus in our experimental task is influenced by both situational factors and individual differences. Therefore, to triangulate, we replace the manipulated regulatory focus variable with a measured variable that is capable of capturing both situational and individual differences in auditors’ focus on the costs and benefits of being proactive.

In the post-experimental questionnaire, we ask participants how much they focused on “avoiding potential costs” and “achieving potential benefits” associated with performing activities that may not be explicitly required by their supervisor in the current engagement.
Participants rated their focus on avoiding costs and their focus on achieving benefits on separate 11-point Likert scales, ranging from 0 (not at all focused) to 10 (completely focused). For each participant, we subtract their avoiding costs rating from their achieving benefits rating and use this difference score as an *ex post* measure of auditors’ focus on achieving benefits versus avoiding costs of proactivity. A higher (lower) value indicates that auditors focus relatively more (less) on achieving benefits than avoiding costs. We perform a median split and use the resulting indicator variable in analyses.  

We re-test our hypotheses using a three-way ANOVA with autonomy, tacit knowledge, and measured regulatory focus as independent variables and *Total Proactive Behaviors* as the dependent variable. Table 2 provides descriptive statistics (Panel A), the ANOVA (Panel B), and tests of hypotheses (Panel C). Figure 2 plots the means.  

Planned contrasts based on the ANOVA (Panel C) show that, consistent with H1, autonomy encourages proactivity to a larger extent when auditors have higher tacit knowledge than when they have lower tacit knowledge (*p* = 0.02). Further, consistent with H2, autonomy encourages proactivity to a marginally larger extent when auditors have a promotion focus compared to when auditors have a prevention focus (*p* = 0.08).

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21 Our measure of regulatory focus is adapted from prior research (Lockwood et al. 2002), which uses questions such as “In general, I am focused on achieving positive outcomes in my life.” to measure chronic promotion focus and questions such as “In general, I am focused on preventing negative events in my life.” to measure chronic prevention focus. The measured regulatory focus variable is not correlated with manipulated regulatory focus (*r* = -0.09 *p* = 0.30). This suggests that the measure is primarily driven by individual differences, rather than the effects of situational factors (i.e., our manipulation). This may be because individual differences are so pronounced that the impact of situational factors is masked or because these questions were fairly removed in time from the manipulation (i.e., they were captured toward the end of the post-experimental questionnaire).

22 The difference scores range from -5 to 10 with a median value of 2. The mean difference score is significantly higher in the measured promotion focus condition (*M* = 5.13) than in the measured prevention focus condition (*M* = 0.21, *t*153 = 17.6, *p* < 0.01). Two participants did not complete the regulatory focus question. Therefore, for analyses based on measured regulatory focus, there are only 155 participants.
Like in our main tests, these results are qualified by a marginally significant three-way interaction ($p = 0.10$, Panel B). Similar to our main results, untabulated analyses show that H2 holds for higher tacit knowledge auditors ($t_{75} = 2.50$, $p = 0.01$ based on planned contrast) but not for lower tacit knowledge auditors ($t_{72} = 0.14$, $p = 0.56$ based on planned contrast). Also similar to our main results, untabulated analyses show that H1 holds for auditors with a promotion focus ($t_{67} = 2.37$, $p = 0.01$ based on planned contrast) but not for auditors with a prevention focus ($t_{80} = 0.29$, $p = 0.39$ based on planned contrast). Taken together, results based on measured regulatory focus corroborate our main results. Consistent with our theory, autonomy encourages proactivity, but only when auditors have both higher tacit knowledge and are more focused on achieving potential benefits of proactive behaviors (i.e., a promotion focus). Further, similar to our main results, auditors with higher autonomy, higher tacit knowledge, and a measured promotion focus are more proactive (mean proactive behaviors = 2.53) than auditors in all other conditions (mean proactive behaviors = 1.41, $t_{153} = 4.25$, $p < 0.01$).

**Similarity of Effects on Each Seeded Behavior**

The four seeded behaviors in our task represent different elements of audit quality (PCAOB 2015, CAQ 2019). Nevertheless, these distinct behaviors share a key attribute (i.e., proactivity) and we expect them to be promoted under common conditions. In this section, we investigate whether our independent variables have similar effects on each of the seeded behaviors. Table 3 Panel A provides descriptive statistics of each behavior by condition.

[Insert Table 3 here]

The pattern of means for each behavior is qualitatively consistent with our expectations. Auditors with higher autonomy are consistently more likely to describe each individual proactive behavior.

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23 We also re-ran our main hypothesis tests with measured regulatory focus as a covariate in our models. All of our main results are unchanged or improve.
behavior than auditors with lower autonomy, but only when they have both higher tacit knowledge and a promotion focus. Pairwise comparisons generally confirm these observations. For auditors who have higher tacit knowledge and a promotion focus, those with higher autonomy are more likely to follow up on the control issue ($t_{38} = 2.07$, one-tailed $p = 0.02$), coordinate with the client ($t_{38} = 1.02$, one-tailed $p = 0.16$), keep staff up-to-date ($t_{38} = 1.95$, one-tailed $p = 0.03$), and invest in staff development ($t_{38} = 1.27$, one-tailed $p = 0.11$) than those with lower autonomy.\(^{24}\) We also re-run our three-way ANOVA using each individual proactive behavior as the dependent variable. The three-way interaction we observe in our main results is not significant for any of the individual behaviors (all $p$-values $> 0.10$), suggesting that our results are driven by our collective measure of proactivity rather than by any individual behavior. Inferences are similar if we replace manipulated regulatory focus with measured regulatory focus (see Table 2, Panel B for descriptive statistics for each behavior using measured regulatory focus). Taken together, the evidence indicates that the four seeded proactive behaviors respond similarly to our independent variables. This provides further support for the notion that these seemingly distinct auditing behaviors share similar attributes and represent examples of the broader construct—proactive audit behaviors.

**Additional Analysis**

**The effect of autonomy on perceived capability.** Our theory predicts that autonomy encourages proactivity by making auditors feel like they are capable of taking action (i.e., that they *can* take opportunities to be proactive). In the post-experimental questionnaire, we ask

\(^{24}\) For auditors with higher tacit knowledge and a prevention focus or auditors with lower tacit knowledge and a prevention focus, there are no significant differences in individual behaviors across autonomy conditions (all $p$’s $> 0.10$ two-tailed). For auditors with lower tacit knowledge and a promotion focus, those with higher autonomy are less likely to invest in staff development than those with lower autonomy ($t_{17} = 2.53$, two-tailed $p = 0.02$); there are no other significant differences in individual behaviors across autonomy conditions (all $p$’s $> 0.10$ two-tailed).
auditors about their perceptions of their capability of carrying out work-related tasks by adapting select items from Parker (1998)’s scale. Specifically, we asked auditors how confident they would feel (a) designing new procedures for audit tasks (b) helping to set targets/goals for the audit team and (c) contributing to discussions about the audit team’s strategy. Auditors responded on 11-point Likert scales ranging from 0 (not at all confident) to 10 (extremely confident). We first perform a factor analysis of these questions and find one factor with an eigenvalue greater than one that accounts for 78.6% of the variance. Next, we analyze the resulting factor scores. Consistent with our theory, higher autonomy auditors felt more capable of taking action than lower autonomy auditors ($t_{154} = 1.78$, one-tailed $p = 0.04$).

The effect of tacit knowledge on attention to seeded proactive opportunities. Our theory predicts that tacit knowledge amplifies the effect of autonomy on proactivity because auditors with higher tacit knowledge are better skilled at identifying opportunities to be proactive. In the post-experimental questionnaire, during which auditors could not return to the case materials, we asked auditors four surprise recall multiple-choice questions about the seeded opportunities to be proactive (e.g., whether the management is known for getting frustrated by last minute requests). These questions measure whether auditors were attentive to the seeded cues and encoded them in memory. We sum the number of correct answers to these questions. As expected, auditors with higher tacit knowledge answer more of these questions correctly ($M = 3.75$) than auditors with lower tacit knowledge ($M = 3.44$, $t_{155} = 2.27$, one-tailed $p = 0.01$). Thus, consistent with our theory, higher tacit knowledge auditors are more knowledgeable about when and how to be proactive.

The effect of regulatory focus on the salience of job outcomes. Our theory predicts that a promotion focus amplifies the effect of autonomy on proactivity because auditors with this
focus dwell more on why they should be proactive (rather than why they should not). We read the job outcomes auditors listed in response to the regulatory focus manipulation and, while blind to condition, we classified each participant’s response as positive-outcome or negative-outcome focused. All the responses we classified as positive (negative) were produced by participants in the promotion-focused (prevention-focused) condition. This suggests that auditors followed instructions and, thus, that the manipulation had the potential to make salient the reasons why auditors would or would not want to be proactive. Additional analysis is challenging, however, because regulatory focus usually affects judgments outside of people’s conscious awareness (e.g., Higgins, Roney, Crowe, and Hymes 1994). Thus, we rely on our measured regulatory focus variable to triangulate our theory about the role of regulatory focus in promoting proactivity.

**Audit Efficiency and Invalid Behaviors**

One concern with providing autonomy is that auditors may take unnecessary actions that harm efficiency without improving audit quality. We investigate whether our independent variables also cause auditors to carry out invalid behaviors. Total proactive behaviors is negatively correlated with the total number of invalid behaviors ($r = -0.10, p = 0.02$). This suggests that auditors who performed more proactive behaviors also took fewer invalid actions. Further, ANOVA analyses using invalid behaviors as the dependent variable confirm that autonomy does not increase invalid behaviors for auditors with higher tacit knowledge, auditors with a promotion focus, or auditors with both of these (i.e. these autonomy by tacit knowledge, autonomy by regulatory focus, and three-way interactions are not significant; all $p$-values > 0.10). Therefore, our independent variables appear to promote quality-enhancing proactive behaviors, but not unwarranted behaviors.
CONCLUSION

Auditing has become increasingly complex (Peecher et al. 2013). For example, financial statements now contain more forward-looking information that requires auditors to integrate information from various sources, consider the implications of information more broadly, and respond to unexpected information (Griffith, Hammersley, Kadous and Young 2015; Hammersley and Ricci 2018; Kadous and Zhou 2019). Due to the dynamic and often unpredictable nature of many audit tasks, regulators and firms are not always able to provide auditors with complete directives in advance. Therefore, in order to achieve high audit quality in complex situations, auditors need to be proactive. Although proactivity is critical to many important auditing behaviors, little is known about determinants of auditor proactivity. We provide theory and empirical evidence about how environmental factors and individual differences work together to promote proactive auditing behaviors. We show that greater autonomy encourages auditor proactivity, but only when auditors have higher tacit knowledge and focus on achieving positive job outcomes (rather than avoiding negative job outcomes).

Our work contributes to the auditing literature by introducing an important construct—proactivity. We study this construct by examining a range of proactive auditing behaviors. Some of these behaviors have a more immediate effect on audit quality (e.g., considering the implications of substantive testing for internal control). For example, our paper suggests that one way to improve the quality of internal control audits, an area where auditors have experienced persistent problems (e.g., PCAOB 2018), is to have auditors think more proactively about how findings from other audit areas could impact the team’s conclusion on internal control effectiveness. Other proactive behaviors examined in our paper have longer-term impacts on audit quality (e.g., staff development) and indirect effects on audit quality (e.g., coordinating
with clients). While these behaviors are equally important to audit quality, they have received less attention in the literature. Thus, our paper complements limited concurrent research on coaching (Andiola et al. 2018) and client coordination (Hatfield et al. 2019) by providing evidence about how these behaviors can be promoted. By studying the construct of auditor proactivity, we also show that this wide range of distinct behaviors share similarities and can be brought about by common factors.

Our paper also contributes to the management literature on proactive behaviors. Prior management studies indicate that autonomy is an antecedent to proactive behaviors (Grant and Ashford 2008). We extend these studies by showing that effects of autonomy on proactive behaviors depend on two other important factors: tacit knowledge and regulatory focus. We examine the interactive effects of these factors in an audit setting, however we expect our results to generalize to other professional settings where employees’ work is complex, proactivity requires specialized knowledge, and the costs of proactivity are salient.

While our main objective is to test theory and provide evidence on what factors facilitate auditor proactivity, our findings can potentially be leveraged by audit firms to improve proactivity. The nature of proactivity suggests that encouraging proactive behaviors in practice can be challenging as firms are not able to provide auditors with related directives in advance. Instead, auditors need to act on their own to identify potential issues and respond proactively. We demonstrate that proactive behaviors can be promoted through autonomy, tacit knowledge, and a promotion focus, in the absence of explicit directives. We expect that audit firms can potentially cultivate work conditions that include each of these determinants of proactivity.

Regarding autonomy, we expect that features of the audit environment have the potential to limit auditors’ sense of autonomy. For example, auditors should adhere to auditing standards,
and typically follow step-by-step audit programs (Madsen 2011; Hammersley and Ricci 2018). Thus, in order for auditors to experience a heightened sense of autonomy, it is important for audit firms or team leaders to encourage autonomy—for instance, by encouraging independent thinking or by fostering a culture that encourages team members to participate in key decision-making processes and gives team members discretion in managing their work to the extent that is allowed by professional standards and firm policy.

Regarding tacit knowledge, firms can attempt to attract and train high tacit knowledge auditors through their hiring and professional development processes. For example, prior research suggests higher tacit knowledge supervisors are more likely to nurture junior auditors and help them develop their own tacit knowledge (Bol et al. 2018). Finally, firms can encourage auditors to adopt a promotion focus by, for example, making positive outcomes more salient in their reward and recognition systems. This may be particularly relevant for the auditing profession since auditors are often held accountable for adverse outcomes (rather than rewarded for positive outcomes) (Peecher et al. 2013).
REFERENCES


Figure 1: The Effects of Autonomy, Tacit Knowledge, and Manipulated Regulatory Focus on Auditor Proactivity

Panel A. The Effects of Autonomy and Tacit Knowledge When Auditors are Prevention Focused

Panel B. The Effects of Autonomy and Tacit Knowledge When Auditors are Promotion Focused

Notes:
This figure summarizes the joint effects of autonomy and tacit knowledge on auditor proactive behaviors when auditors have a prevention focus (Panel A) and a promotion focus (Panel B). The dependent measure, Total Proactive Behaviors, is the sum of proactive behaviors that auditors indicated that they would like to perform. We manipulate autonomy by describing a more (less) autonomous culture and providing auditors with more (less) discretion in managing their work. We manipulate regulatory focus by asking auditors in the prevention-focused (promotion-focused) condition to list three negative (positive) outcomes of poor (excellent) job performance that auditors have incentive to avoid (achieve). We measure auditor tacit knowledge by adapting questions from Bol et al. (2018) and performing a median split to group participants into conditions.
**Figure 2: The Effects of Autonomy, Tacit Knowledge, and Measured Regulatory Focus on Auditor Proactivity**

Panel A. The Effects of Autonomy and Tacit Knowledge When Auditors are Prevention Focused

Panel B. The Effects of Autonomy and Tacit Knowledge When Auditors are Promotion Focused

**Notes:**
This figure summarizes the joint effects of autonomy and tacit knowledge on auditor proactive behaviors when auditors have a prevention focus (Panel A) and a promotion focus (Panel B). See Figure 1 for description of the dependent variable, *Total Proactive Behaviors*, and independent variables, *autonomy* and *tacit knowledge*. We measure *regulatory focus* by asking auditors to rate how much they focus on “avoiding potential costs” and “achieving potential benefits” associated with performing activities that may not be explicitly required by their supervisor. We then calculate a difference score by subtracting auditors’ cost rating from their benefits rating and perform a median split of the different score to group auditors into promotion focus and prevention focus conditions.
Table 1: The Effects of Autonomy, Tacit Knowledge, and Manipulated Regulatory Focus on Auditor Proactivity

Panel A. Mean (Std. Dev.) of Total Proactive Behaviors

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<th>Manipulated Regulatory Focus</th>
<th>Lower Tacit Knowledge</th>
<th>Higher Tacit Knowledge</th>
<th>Collapsed Across Knowledge</th>
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<td>Lower Autonomy</td>
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<tr>
<td>Prevention Focus</td>
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<td>1.14 (0.94)</td>
<td>1.22 (0.99)</td>
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<tr>
<td></td>
<td>n = 17</td>
<td>n = 22</td>
<td>n = 36</td>
</tr>
<tr>
<td>Collapsed Across Focus</td>
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<td>1.34 (0.94)</td>
<td>1.40 (0.93)</td>
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Panel B. ANOVA Model

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<td>Regulatory Focus</td>
<td>1</td>
<td>1.55</td>
<td>1.51</td>
<td>0.22</td>
</tr>
<tr>
<td>Autonomy × Tacit Knowledge</td>
<td>1</td>
<td>2.91</td>
<td>2.85</td>
<td>0.09</td>
</tr>
<tr>
<td>Autonomy × Regulatory Focus</td>
<td>1</td>
<td>0.07</td>
<td>0.06</td>
<td>0.80</td>
</tr>
<tr>
<td>Tacit Knowledge × Regulatory Focus</td>
<td>1</td>
<td>0.00</td>
<td>0.00</td>
<td>0.99</td>
</tr>
<tr>
<td>Autonomy × Tacit Knowledge × Regulatory Focus</td>
<td>1</td>
<td>3.05</td>
<td>2.99</td>
<td>0.09</td>
</tr>
<tr>
<td>Residual</td>
<td>149</td>
<td>1.02</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Panel C. Hypothesis Tests

<table>
<thead>
<tr>
<th>Contrast</th>
<th>t_149</th>
<th>p -value</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: (D - C) &gt; (B - A)</td>
<td>1.69</td>
<td>0.05</td>
</tr>
<tr>
<td>H2: (H - G) &gt; (F - E)</td>
<td>0.24</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Notes:
This table reports descriptive statistics (Panel A), the three-way ANOVA model (Panel B), and test of hypotheses (Panel C) for Total Proactive Behaviors. The dependent measure, Total Proactive Behaviors, is the sum of proactive behaviors that auditors indicated that they would like to perform. We manipulate autonomy by describing a more (less) autonomous culture and providing auditors with more (less) discretion in managing their work. We manipulate regulatory focus by asking auditors in the prevention-focused (promotion-focused) condition to list three negative (positive) outcomes of poor (excellent) job performance that auditors have incentive to avoid (achieve). We measure tacit knowledge by adapting questions form Bol et al. (2018) and performing a median split to group participants into conditions.
Table 2: The Effects of Autonomy, Tacit Knowledge, and Measured Regulatory Focus on Auditor Proactivity

Panel A. Mean (Std. Dev.) of Total Proactive Behaviors

<table>
<thead>
<tr>
<th>Measured Regulatory Focus</th>
<th>Lower Tacit Knowledge</th>
<th>Higher Tacit Knowledge</th>
<th>Collapsed Across Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Prevention Focus</td>
<td>1.17 (1.10)</td>
<td>1.22 (0.93)</td>
<td>1.44 (0.92)</td>
</tr>
<tr>
<td>n = 18</td>
<td>n = 27</td>
<td>n = 18</td>
<td>n = 21</td>
</tr>
<tr>
<td>Promotion Focus</td>
<td>1.59 (1.37)</td>
<td>1.57 (0.94)</td>
<td>1.36 (0.95)</td>
</tr>
<tr>
<td>n = 17</td>
<td>n = 14</td>
<td>n = 25</td>
<td>n = 15</td>
</tr>
<tr>
<td>Collapsed Across Focus</td>
<td>1.37 (1.24)</td>
<td>1.34 (0.94)</td>
<td>1.40 (0.93)</td>
</tr>
<tr>
<td>n = 35</td>
<td>n = 41</td>
<td>n = 43</td>
<td>n = 36</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
</tr>
</tbody>
</table>

Panel B. ANOVA Model

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p -value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomy</td>
<td>1</td>
<td>4.44</td>
<td>4.61</td>
<td>0.03</td>
</tr>
<tr>
<td>Tacit Knowledge</td>
<td>1</td>
<td>4.58</td>
<td>4.76</td>
<td>0.03</td>
</tr>
<tr>
<td>Regulatory Focus</td>
<td>1</td>
<td>5.92</td>
<td>6.15</td>
<td>0.01</td>
</tr>
<tr>
<td>Autonomy × Tacit Knowledge</td>
<td>1</td>
<td>3.96</td>
<td>4.11</td>
<td>0.04</td>
</tr>
<tr>
<td>Autonomy × Regulatory Focus</td>
<td>1</td>
<td>1.98</td>
<td>2.06</td>
<td>0.15</td>
</tr>
<tr>
<td>Tacit Knowledge × Regulatory Focus</td>
<td>1</td>
<td>0.01</td>
<td>0.01</td>
<td>0.93</td>
</tr>
<tr>
<td>Autonomy × Tacit Knowledge × Regulatory Focus</td>
<td>1</td>
<td>2.65</td>
<td>2.75</td>
<td>0.10</td>
</tr>
<tr>
<td>Residual</td>
<td>147</td>
<td>0.96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Panel C. Hypothesis Tests

<table>
<thead>
<tr>
<th>Contrast</th>
<th>t</th>
<th>p -value</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: (D - C) &gt; (B - A)</td>
<td>2.03</td>
<td>0.02</td>
</tr>
<tr>
<td>H2: (H - G) &gt; (F - E)</td>
<td>1.44</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Notes:
This table reports descriptive statistics (Panel A), the three-way ANOVA model (Panel B), and test of hypotheses (Panel C) for Total Proactive Behaviors. See Table 1 for description of the dependent variable, Total Proactive Behaviors, and independent variables, autonomy and tacit knowledge. We measure regulatory focus by asking auditors to rate how much they focus on “avoiding potential costs” and “achieving potential benefits” associated with performing activities that may not be explicitly required by their supervisor. We then calculate a difference score by subtracting auditors’ cost rating from their benefits rating and perform a median split of the different score to group auditors into promotion focus and prevention focus conditions. The above analyses are based on 155 participants who answered both the costs and benefits questions.
## Table 3: Descriptive Statistics of Individual Proactive Behavior

### Panel A. Mean (Std. Dev.) of Proactive Behaviors (Based on Manipulated Regulatory Focus)

<table>
<thead>
<tr>
<th>Manipulated Regulatory Focus</th>
<th>Lower Tacit Knowledge</th>
<th>High Tacit Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Autonomy</td>
<td>Higher Autonomy</td>
</tr>
<tr>
<td>Control Issue</td>
<td>0.32</td>
<td>0.16</td>
</tr>
<tr>
<td>Follow-up</td>
<td>(0.48)</td>
<td>(0.37)</td>
</tr>
<tr>
<td>Coordinate with Client</td>
<td>0.32</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td>(0.48)</td>
<td>(0.51)</td>
</tr>
<tr>
<td>Keep Staff</td>
<td>0.47</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>(0.51)</td>
<td>(0.45)</td>
</tr>
<tr>
<td>Coordinate with Client</td>
<td>0.21</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>(0.42)</td>
<td>(0.37)</td>
</tr>
<tr>
<td>Total Proactive Behaviors</td>
<td>1.32 (1.38)</td>
<td>1.58 (0.90)</td>
</tr>
<tr>
<td></td>
<td>n = 19</td>
<td>n = 19</td>
</tr>
</tbody>
</table>

### Panel B. Mean (Std. Dev.) of Proactive Behaviors (Based on Manipulated Regulatory Focus)

<table>
<thead>
<tr>
<th>Manipulated Regulatory Focus</th>
<th>Lower Tacit Knowledge</th>
<th>High Tacit Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Autonomy</td>
<td>Higher Autonomy</td>
</tr>
<tr>
<td>Control Issue</td>
<td>0.12</td>
<td>0.23</td>
</tr>
<tr>
<td>Follow-up</td>
<td>(0.33)</td>
<td>(0.43)</td>
</tr>
<tr>
<td>Coordinate with Client</td>
<td>0.41</td>
<td>0.36</td>
</tr>
<tr>
<td></td>
<td>(0.51)</td>
<td>(0.49)</td>
</tr>
<tr>
<td>Keep Staff</td>
<td>0.59</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>(0.51)</td>
<td>(0.51)</td>
</tr>
<tr>
<td>Coordinate with Client</td>
<td>0.24</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>(0.44)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Total Proactive Behaviors</td>
<td>1.35 (1.11)</td>
<td>1.14 (0.94)</td>
</tr>
<tr>
<td></td>
<td>n = 17</td>
<td>n = 22</td>
</tr>
</tbody>
</table>
Panel B. Mean (Std. Dev.) of Proactive Behaviors (Based on Measured Regulatory Focus)

<table>
<thead>
<tr>
<th>Measured Regulatory Focus</th>
<th>Lower Tacit Knowledge</th>
<th>High Tacit Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Autonomy</td>
<td>Higher Autonomy</td>
</tr>
<tr>
<td>Control Issue</td>
<td>0.17</td>
<td>0.15</td>
</tr>
<tr>
<td>Follow-up</td>
<td>(0.38)</td>
<td>(0.36)</td>
</tr>
<tr>
<td>Coordinate with Client</td>
<td>0.39</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>(0.50)</td>
<td>(0.49)</td>
</tr>
<tr>
<td>Keep Staff Up-to-Date</td>
<td>0.44</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>(0.51)</td>
<td>(0.49)</td>
</tr>
<tr>
<td>Staff Development</td>
<td>0.17</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>(0.38)</td>
<td>(0.27)</td>
</tr>
<tr>
<td>Total Proactive Behaviors</td>
<td>1.17</td>
<td>1.22</td>
</tr>
<tr>
<td></td>
<td>(1.10)</td>
<td>(0.93)</td>
</tr>
<tr>
<td></td>
<td>n = 18</td>
<td>n = 27</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Promotion Focus</th>
<th>Lower Tacit Knowledge</th>
<th>High Tacit Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Autonomy</td>
<td>Higher Autonomy</td>
</tr>
<tr>
<td>Control Issue</td>
<td>0.29</td>
<td>0.29</td>
</tr>
<tr>
<td>Follow-up</td>
<td>(0.47)</td>
<td>(0.47)</td>
</tr>
<tr>
<td>Coordinate with Client</td>
<td>0.35</td>
<td>0.57</td>
</tr>
<tr>
<td></td>
<td>(0.49)</td>
<td>(0.51)</td>
</tr>
<tr>
<td>Keep Staff Up-to-Date</td>
<td>0.65</td>
<td>0.64</td>
</tr>
<tr>
<td></td>
<td>(0.49)</td>
<td>(0.50)</td>
</tr>
<tr>
<td>Staff Development</td>
<td>0.29</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>(0.47)</td>
<td>(0.27)</td>
</tr>
<tr>
<td>Total Proactive Behaviors</td>
<td>1.59</td>
<td>1.57</td>
</tr>
<tr>
<td></td>
<td>(1.37)</td>
<td>(0.94)</td>
</tr>
<tr>
<td></td>
<td>n = 17</td>
<td>n = 14</td>
</tr>
</tbody>
</table>

Notes:
This table reports descriptive statistics of four seeded proactive behaviors based on manipulated regulatory focus (Panel A) and measured regulatory focus (Panel B). The four seeded proactive behaviors are: “Control issue follow-up” that measures whether auditors follow up on the control issue indicated by the revenue substantive tests; “Coordinate with client” that measures whether auditors prioritize sample selection to accommodate the client’s limited availability; “Keep staff up-to-date” that measures whether auditors keep the staff up-to-date on new accounting policy; and “Staff development” that measures whether auditors invest in the staff’s professional development. “Total Proactive Behaviors” is the sum of these four seeded proactive behaviors. The independent variables in Panel A and B are described in Table 1 and Table 2, respectively.