

Using Audit Programs to Improve Auditor Evidence Collection

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ABSTRACT: Auditors experience difficulty auditing accounts for which it is difficult to identify in advance all the evidence necessary to perform an effective audit. These accounts are challenging because they commonly require auditors to collect additional, relevant evidence in response to new information received during evidence collection. We address this experimentally by examining whether changing the focus of audit programs from plan-focused (i.e., focused on the planned audit procedures) to goal-focused (i.e., focused on the task goal) improves auditors' collection of relevant evidence that is not identifiable at audit program creation. We expect goal-focused auditors to remain open to more ways to achieve their goal. Consequently, we expect and find that goal-focused auditors collect more effective evidence than plan-focused auditors and follow up more effectively on this evidence. This suggests that a goal-focused approach improves audit quality on tasks requiring auditors to flexibly respond to new information.

Keywords: audit programs; audit planning; evidence collection; goals.

I. INTRODUCTION

Auditors experience difficulty when auditing accounts on which it is difficult to identify in advance all the necessary audit evidence, such as estimates (Griffith, Hammersley, and Kadous 2015a; Cannon and Bedard 2017) and accounts with elevated fraud risk (Hammersley 2011). These types of accounts are challenging because they commonly require auditors to collect non-standard evidence (Asare and Wright 2004), all of which cannot be specified in the audit program during the planning stage (Griffith, Hammersley, Kadous, and Young 2015b). Thus, when necessary evidence is difficult to identify in advance, auditors must remain flexible and follow up on cues they encounter during the audit that indicate additional evidence is relevant and necessary. However, the Public Company Accounting Oversight Board (PCAOB) indicates that auditors sometimes do not “respond appropriately to potential issues identified during the audit” (PCAOB 2009, 14) or adequately take into account new evidence that is available during the audit (PCAOB 2014).

Regulators and academics have suggested that auditors' use of step-by-step audit programs may be a root cause of these problems (Canadian Public Accountability Board [CPAB] 2014; Griffith et al. 2015a). Step-by-step programs list specific procedures to be performed that address risks identified during the audit planning stage (McDaniel 1990; Asare and Wright

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Supplemental material can be accessed by clicking the link in Appendix C.

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2004; Griffith et al. 2015b). Auditing standards require auditors to develop a plan in response to identified risks (PCAOB 2010a); practitioners typically use audit programs to ensure that audit risk is reduced to the planned level when all procedures listed in the program are performed (McDaniel 1990, BDO Seidman 2004). Audit programs improve efficiency, effectiveness, and consistency of performance on some tasks (McDaniel 1990). However, since step-by-step programs represent a detailed plan for carrying out the audit, they may impede auditors' collection of additional, relevant evidence in response to new information (Griffith et al. 2015b).

In this study, we examine two research questions. First, we investigate whether changing the focus of the audit program improves auditors' collection of relevant evidence that cannot be identified during planning. Specifically, we examine whether auditors who use goal-focused audit programs (e.g., those that focus on meeting the goal of a task, such as evaluating the reasonableness of an estimate assumption) are more likely to collect relevant, previously unplanned evidence than auditors who use plan-focused audit programs (e.g., those that focus on performing a list of planned procedures to meet that same goal, such as step-by-step programs). Second, since plan-focused audit programs have benefits (McDaniel 1990), it is important to consider whether auditors' performance can be enhanced while retaining these programs. Thus, we also examine whether an intervention that prompts auditors to think abstractly about why their task is important improves the performance of auditors who use plan-focused programs.

We draw on psychology literature about planning effectiveness. Most of these studies focus on the benefits of making plans, but a growing literature documents conditions under which having a general task goal is more effective than specific plans to achieve the same goal. Critically, people with a general task goal remain open to more ways to achieve their goal, while people with specific plans are so focused on their plans that they are less likely to notice alternative ways to achieve their goal (Parks-Stamm, Gollwitzer, and Oettingen 2007; Bayuk, Janiszewski, and Leboeuf 2010; Masicampo and Baumeister 2012). Thus, general task goals have advantages over specific plans when essential steps needed to achieve a goal cannot be specified in advance. We expect that auditors who use goal-focused audit programs under these conditions will be more likely to collect relevant, previously unplanned evidence and to follow up more effectively on this evidence than auditors who use plan-focused audit programs.

Further, people can mitigate the drawbacks of having specific plans by thinking abstractly about *why* they perform a task, which activates their higher-level goals. Higher-level goals are broader than general task goals. Activation of higher-level goals slows down people's performance of planned actions and re-focuses them on overarching goals that motivate their specific plans (Bayuk et al. 2010; Wieber, Sezer, and Gollwitzer 2014). Thus, we also expect that plan-focused auditors who think abstractly will collect more relevant, unplanned evidence and follow up more effectively on this evidence, than plan-focused auditors who do not.

To test our predictions, we perform a 2×2 online experiment and manipulate audit-program focus (plan-focused versus goal-focused) and the presence of a prompt to think abstractly (no prompt versus abstract prompt). Experienced auditors evaluate the client's revenue projections. We hold constant information availability by telling all auditors that their task goal is to evaluate the reasonableness of the revenue projections and by describing six procedures that are planned to test these projections. Plan-focused auditors produce and use an audit program that focuses on the planned procedures and goal-focused auditors produce and use an audit program that focuses on the general task goal. Auditors receiving the abstract prompt receive an intervention that focuses them on why their task is important and, thus, on higher-level goals.

Next, auditors receive new information about risks that were not identifiable when the audit program was created. After reviewing this information, auditors collect evidence by selecting from a population of audit procedures and examining the evidence revealed by each procedure. The population of procedures includes the planned procedures and some unplanned procedures, including target and irrelevant procedures. The target procedures allow auditors to investigate the newly introduced risks and reveal target issues that strongly suggest that the revenue projections are overstated. We measure the number of target procedures selected and the number of target issues auditors want to discuss with their manager.

We find that goal-focused auditors choose more target procedures and want to discuss more target issues with their manager than plan-focused auditors. Although goal-focused auditors' judgments of the reasonableness of the revenue projections are not different from those of plan-focused auditors, goal-focused auditors collect more relevant evidence and communicate more relevant information to their managers. This is important because auditors have discretion about what information to communicate to supervisors (Rich, Solomon, and Trotman 1997). Further, supervisors' judgments are influenced by the mix of information received from subordinates (e.g., Agoglia, Kida, and Hanno 2003). We corroborate this in a supplemental experiment, which shows that experienced managers who receive the target evidence judge the revenue projections as less reasonable and are more concerned about the target issues than managers who do not receive this evidence. Thus, goal-focused auditors improve audit quality by providing a higher quality set of information to their supervisors who, in turn, make better judgments. We find no evidence that thinking abstractly improves plan-focused auditor performance, despite a successful manipulation.

In supplemental analyses, we also show that goal-focused auditors pay more attention to risks introduced after the audit program was set, do not neglect planned procedures, and do not select more irrelevant procedures. Further, plan-focused auditors often engage in a rote search for evidence. Indeed, 44 percent of plan-focused auditors only select planned procedures and 17 percent of plan-focused auditors select the planned procedures *in the order listed* on the plan-focused program, even though evidence order was randomized for each auditor.

Our study contributes to theory and practice by addressing one of the problems with auditing that has been most difficult to solve because adding a new checklist or audit program step is not effective for ensuring collection of as yet unidentified, but necessary audit evidence (Griffith et al. 2015b). Instead, improving performance on tasks that require auditors to flexibly respond to new information likely requires new approaches. Our study suggests that goal-focused programs are a promising innovation that can help improve performance when auditing accounts for which it is difficult to identify all relevant evidence in advance, such as estimates and higher fraud-risk accounts. Our study makes the following contributions to the literature.

First, we contribute to the audit programs literature. While early work showed audit programs increase performance consistency (McDaniel 1990), Asare and Wright (2004) show that starting with a standard audit program interferes with auditors' ability to *plan* effective non-standard fraud procedures compared to starting with a blank page. We extend Asare and Wright (2004) by holding constant the task goal and procedure information auditors receive and showing that the focus of audit programs affects auditors' evidence collection decisions.

Second, we contribute to the complex estimates literature by identifying a change in audit program structure that can be deployed to improve auditors' information search when auditing accounts for which relevant, unplanned evidence is likely to emerge. Prior work has identified changes to auditors' general cognitive approaches or motivations that improve estimate audit quality. For example, Griffith et al. (2015b) show that a deliberative mindset, a general cognitive orientation that operates independently of the task, improves auditors' use of incidentally encountered evidence already in their possession. Rasso (2015) finds that changing how abstractly auditors construe incoming evidence helps auditors suspend judgment and increases the amount of additional evidence requested. Kadous and Zhou (2019) show that making auditors' intrinsic motivation salient increases their attention to and processing of evidence already in their possession. In contrast, we show that changing the structure of a common audit tool, the audit program, to be more goal-focused improves auditors' information search by increasing their attention to opportunities to deviate from planned procedures; this is useful when conditions are right for relevant, unplanned evidence to emerge. Thus, each of these interventions helps improve a different dimension of performance when auditing estimates, under different circumstances. Since problems with estimates are not monolithic, making progress in this area requires us to continue cataloging these problems and identifying methods that improve different dimensions of performance. We add to the literature by identifying a change to the audit program that increases auditors' flexibility when searching for evidence.

Third, when contrasted with the effectiveness of the goal-focused program, the ineffectiveness of the abstract prompt, despite a successful manipulation, has important theoretical implications. Supplemental analyses suggest that goal-focused programs are effective because they *remove* the barrier to performance (i.e., a focus on performing planned procedures) from the audit program that guides auditors' search for evidence. In contrast, thinking abstractly is designed to *disrupt* the cognitive drawbacks of using plan-focused programs. After ruling out several alternative explanations for why the abstract prompt was ineffective, we conclude that thinking abstractly is simply insufficient to overcome the drawbacks of plan-focused programs. Combined with our evidence about rote evidence collection by plan-focused auditors, this suggests that plan-focused audit programs have powerful, difficult to overcome effects.

Finally, we contribute to the debate in psychology over the drawbacks of specific plans (see Masicampo and Baumeister 2012). Prior psychology studies examine the effect of having task goals versus rehearsing specific plans to achieve those goals. However, in auditing, plans are complex, likely have information content about what auditors should do, and are not typically rehearsed. Thus, unlike psychology studies, we hold constant auditors' goals and plans, examine the effect of changing the *focus* of the audit plan, and do not ask auditors to rehearse their plans. Although these choices create tension, we show that specific plans can be detrimental in settings such as auditing, where people have a professional responsibility to update their risk assessments and procedures in response to new information (PCAOB 2010b).

II. THEORY AND HYPOTHESIS DEVELOPMENT

We propose that it is often difficult to identify all of the steps that will be necessary to effectively audit an account during the planning stage. This issue is pronounced for complex estimates and accounts with elevated fraud risk, but is relevant to any account for which auditors must flexibly respond to new information. Complex estimates are challenging because auditors begin with an incomplete understanding of all of the embedded assumptions and the sensitivity of the estimate to these

assumptions (Griffith et al. 2015b). As auditors gain a deeper understanding of estimates, they need to update the types of evidence they search for and evaluate (Griffith et al. 2015a). Similarly, fraud situations are difficult because auditors begin with a limited understanding of the effects of identified fraud risks and cannot evaluate management intent during planning (Hamilton 2016). Auditors must adapt the audit approach to accommodate fraud cues that surface during evidence evaluation (Austin 2019). Although estimates and fraud situations typically require flexibility, other accounts can also require flexibility. For example, when there are changes to process structures or control systems or when management discloses important issues to auditors late in the year (McCracken, Salterio, and Gibbins 2008), it may be difficult to fully populate the audit program. Thus, understanding how audit program use affects audit quality in these situations is also important.

Psychology theory shows that people who make specific plans explaining when, where, and how they plan to act are often more likely to achieve their goals (Gollwitzer and Brandstätter 1997; Gollwitzer 1999; Gollwitzer and Sheeran 2006). They show heightened attention to the goal pursuit opportunities specified in their plans (Gollwitzer 1999; Gollwitzer, Fujita, and Oettingen 2004; Gollwitzer and Sheeran 2006), freeing up cognitive resources that would otherwise be dedicated to searching for opportunities to act (Masicampo and Baumeister 2012). Further, people with specific plans automatically initiate the actions specified therein (Gollwitzer 1999; Gollwitzer et al. 2004; Gollwitzer and Sheeran 2006). While pursuing their goals, people with specific plans do not have to think carefully about what to do since they have already decided (Masicampo and Baumeister 2012). Thus, specific planning is often beneficial because it helps people get started on their goals and avoid distractions (Gollwitzer and Sheeran 2006).

Although specific plans are often beneficial, growing evidence shows that under certain conditions general task goals have advantages over specific plans. People with general task goals attend to and are open to performing a broader set of goal pursuit activities than people with specific plans (Parks-Stamm et al. 2007; Bayuk et al. 2010; Masicampo and Baumeister 2012). People with general task goals are also more likely to recognize unplanned opportunities to achieve their goals than people with specific plans who tend to focus all of their attention on the goal pursuit opportunities specified in their plan (Ordóñez, Schweitzer, Galinsky, and Bazerman 2009). This is especially true when the unplanned opportunities are difficult to identify (Parks-Stamm et al. 2007). Further, even if people with specific plans notice unplanned opportunities to pursue their goals, they devalue them because they feel committed to following their plans (Bayuk et al. 2010; also see discussion of Häfner's thesis in Gollwitzer, Parks-Stamm, Jaudas, and Sheeran [2008]). Thus, a general task goal has advantages over a specific plan in settings where essential steps needed to achieve a goal cannot be identified at the time plans are made.

When critical audit procedures cannot be identified prior to the start of testing, we expect that plan-focused programs contain a barrier to effective evidence collection. Specifically, we expect auditors who use plan-focused audit programs to concentrate on carefully completing the steps stated in the program, at the expense of noticing and acting upon new risks that arise during testing. In contrast, we expect the general task goal contained in goal-focused programs to remove this barrier to performance, enabling auditors to flexibly consider a variety of different means by which they can effectively perform their task. Thus, we expect auditors who use goal-focused audit programs to be more attentive to new risks that arise during testing and more open to collecting relevant, unplanned evidence in response to these risks. We expect:

H1: Goal-focused auditors will be more likely to collect relevant, previously unplanned evidence than plan-focused auditors.

We next turn to research examining how people can maintain a specific plan without missing out on unplanned opportunities to achieve their goals. This is important because step-by-step audit programs are common in practice. The goals literature widely recognizes that goals are organized hierarchically (Carver and Scheier 1982; Vallacher and Wegner 1987; Trope and Liberman 2010). People have higher-level goals (e.g., to be healthy) that they break down into general task goals (e.g., exercising). Further, they identify specific actions they can take in order to pursue their general task goals (e.g., going to the gym after work today). Thus, although plan-focused auditors focus on completing a series of actions (i.e., audit procedures), these actions relate to a general task goal (e.g., evaluating the reasonableness of a model assumption) and to higher-level goals the task serves (e.g., identifying misstatements in the financial statements). People's higher-level goals convey information about the central features or meaning of a task (i.e., why a task is performed), and omit specific details about what will be done to complete a task (i.e., how a task is performed; Trope and Liberman 2010).

Thinking abstractly about why a task is performed activates higher-level goals and, critically, these goals can unconsciously remain active while people follow a specific plan (Bayuk et al. 2010). Further, thinking abstractly about why a task is important mitigates the drawbacks of following specific plans. Thinking abstractly slows down people's automatic initiation of planned actions, allowing them to consider unplanned opportunities to achieve their goals (Wieber et al. 2014). Further, since thinking abstractly activates people's higher-level goals, it re-focuses them on what motivated the specific plan, making it easier for them to recognize the connection between unplanned actions and their overarching goals. Thus, thinking

abstractly before following a specific plan helps people overcome their tendency to devalue unplanned opportunities to pursue their goals (Bayuk et al. 2010).¹

Together, the literature suggests that auditors who use plan-focused audit programs can overcome their narrow focus on the planned procedures by first thinking abstractly about why it is important to perform their task. Auditors who think abstractly about their higher-level goals (e.g., to identify misstatements in the financial statements) should be more likely to make connections between their overarching goals and relevant unplanned evidence. This should reduce the automaticity of their evidence collection and increase the intentionality with which they choose evidence; this should also reduce their tendency to devalue relevant evidence that is not part of the audit plan. Thus, we expect abstract thinking to activate auditors' higher level goals and this will mitigate the drawbacks of using a plan-focused program. We expect:

H2: Plan-focused auditors who think abstractly about their task will be more likely to collect relevant, previously unplanned evidence than plan-focused auditors who do not think abstractly.

Finally, we consider how thinking abstractly affects evidence collection by auditors using goal-focused programs. Psychology research on planning does not lead to clear predictions about how thinking abstractly affects people focused on a general task goal. Planning research shows that thinking abstractly can motivate people to work harder on their general task goal by reinforcing their commitment to this goal (Wieber et al. 2014) or lead to inaction by prompting indecisiveness about how to go about pursuing higher-level goals (Bayuk et al. 2010). However, this literature does not identify conditions under which thinking abstractly is more likely to lead to increased motivation rather than inaction. Broader literature on abstract mental representations suggests that thinking abstractly can help people see the big picture (Wakslak, Trope, Liberman, and Alony 2006). However, we do not expect auditors using goal-focused programs to be subject to the "tunnel vision" that abstract thinking disrupts because these programs lack the narrow focus on planned procedures present in plan-focused programs. Thus, we do not expect goal-focused auditors who think abstractly to collect more relevant, unplanned evidence than goal-focused auditors who do not think abstractly, but we do not make any formal predictions about performance across these conditions.

Judgment and Decision Performance

After collecting evidence, auditors evaluate the evidence, prepare information for supervisor review, and communicate potential issues to supervisors (Griffith et al. 2015a). Importantly, auditors have discretion about what to communicate and selectively present evidence to convince supervisors of their views (Rich et al. 1997). Auditors also have incentives to be efficient and avoid conflicts with client management; this can make them hesitant to follow up on evidence contradicting management's assertions (Coram, Ng, and Woodliff 2004; Bennett and Hatfield 2013; Brazel, Jackson, Schaefer, and Stewart 2016). Indeed, auditors sometimes engage in motivated reasoning, where they underweight information contradicting management's assertions (Hackenbrack and Nelson 1996; Kadous, Kennedy, and Peecher 2003; Austin, Hammersley, and Ricci 2020). Alternatively, auditors may underweight contradicting evidence if they do not recognize the importance of it. Thus, auditors who collect more relevant, unplanned evidence may fail to evaluate it appropriately or follow up on the evidence.

Nevertheless, on average, we expect that auditors who collect more relevant, unplanned evidence will make higher quality judgments and follow up on the evidence more effectively than auditors who do not collect this evidence. Auditors who collect better evidence should gain a better understanding of potential audit issues than auditors who do not. Further, we expect that auditors with a better understanding of potential audit issues will better understand the implications of the evidence for management's proposed accounting and, despite the potential for motivated reasoning, this will translate into more concern about a potential misstatement. All else equal, auditors who are more concerned should follow up by communicating more relevant information to their supervisors. Since supervisors' judgments are influenced by the mix of information received by their subordinates (Ricchiute 1999; Yip-Ow and Tan 2000; Agolia et al. 2003, Tan and Trotman 2003), audit effectiveness likely improves when auditors communicate a more complete set of evidence to their supervisors. We expect:

H3: Goal-focused auditors will make higher quality judgments and follow up on evidence that contradicts management's assertions more effectively than plan-focused auditors.

¹ Importantly, thinking abstractly is different from using goal-focused programs. Goal-focused programs modify the structure of the audit program, the tool auditors use to guide their information search, by removing the narrow focus on planned procedures present in plan-focused programs. The general task goal in goal-focused programs enables auditors to flexibly consider alternative ways to perform their task and encourages auditors to search for evidence by performing whatever procedures they deem necessary to accomplish their task goal. In contrast, thinking abstractly does not involve any structural changes to the audit program. Auditors who think abstractly can populate their audit programs with planned procedures and use these plan-focused programs to guide their search for evidence. However, thinking abstractly about the overarching purpose of the task (e.g., why it is important) before using plan-focused programs should disrupt the "tunnel vision" typically induced by these programs by helping auditors make connections between their overarching goals and unplanned, relevant evidence.

H4: Plan-focused auditors who think abstractly about their task will make higher quality judgments and follow up on evidence that contradicts management's assertions more effectively than plan-focused auditors who do not think abstractly.

III. RESEARCH METHOD

We perform a 2×2 experiment and manipulate audit-program focus (plan-focused versus goal-focused) and the presence of a prompt to think abstractly about why the task is important (no prompt versus abstract prompt). We obtained data from auditors at eight audit firms, including each of the Big 4 firms. We collected our data online using a Qualtrics survey and our final dataset contains 123 responses.² The auditors in our final data set include 115 seniors and 8 managers. Their average experience is 47 months, with a range of 18 to 144 months. Experienced seniors are appropriate participants because these auditors regularly evaluate the reasonableness of complex estimate assumptions (Griffith et al. 2015a) and have significant responsibility for directing the search for evidence (Hammersley, Johnstone, and Kadous 2011).³

Task

Auditors evaluated the reasonableness of the client's revenue projections, a key input to a fair value estimate used in the client's goodwill impairment test. We heavily adapted our task from prior research (e.g., Griffith et al. 2015b; Austin et al. 2020; Kadous and Zhou 2019). As illustrated in Figure 1, the case began with background information about an electronics-manufacturer client and the client's step one goodwill impairment test. The client estimated the fair value of a reporting unit using a discounted cash flow model and concluded that the fair value exceeded the book value and, thus, goodwill was not impaired. We instructed auditors that their task was to evaluate the revenue projections used in the model. We explained that the audit team had already tested the other aspects of the model and found no exceptions.

Next, auditors planned the audit of the revenue projections. We told all auditors that their goal was to evaluate the reasonableness of the revenue projections and that they had a planning discussion with their manager, which identified six audit procedures to perform.⁴ After reviewing this information, auditors produced an audit program according to our instructions (described below), completed the abstract-prompt if assigned to the prompt condition, and reviewed a summary of the CFO's comments about the revenue projections. Importantly, the CFO's comments introduced new risks that were not identifiable when auditors produced their audit program. The CFO explained that the company recently moved up its planned release date for a new product because a competitor was working on a similar product, thus seeding risks related to: (1) the competing product interfering with the anticipated success of the new product and (2) the company's ability to develop, produce, and release the new product according to its revised timeline. Information available later in the case showed that the company's fair value estimate and its ability to pass the step one test were sensitive to small changes in the revenue projections and, thus, the timely success of the new product.

After reviewing the CFO's comments, auditors proceeded to their main task, testing the revenue projections. With their audit program visible at the top of their screen, auditors selected from a population of 12 audit procedures and examined the evidence revealed by each procedure they selected (see Appendix A). They performed this process iteratively, repeating it until they indicated that they were finished.^{5,6} The population of procedures contained the six *planned procedures* that were identified during the discussion with the manager, two unplanned *target procedures* that provided further information about the

² We obtained institutional review board approval for this study. Auditors opened the link to our study 191 times and 142 auditors finished the study. We eliminated data from the following 19 auditors, although inferences are unchanged and all significant results continue to hold at $p < 0.10$ if we use data from all 142 auditors who finished the study: one staff who does not have the knowledge and experience to perform the task, nine auditors who skipped significant portions of the study (one who did not write anything in response to the abstract prompt and eight who skipped the main task of selecting procedures and examining evidence), six auditors who spent eight or fewer minutes on the entire study (retained participants spent a median of 34 minutes), and three auditors who did not follow our instructions to complete the task in one sitting as evidenced by spending over ten minutes on a single screen *after* receiving the manipulations (retained participants include 12 who were likely idle *before* receiving the manipulations). A binary logistic model shows that the likelihood of exclusion does not differ across conditions (main effect and interaction p 's all > 0.219), suggesting that random assignment is preserved after these exclusions.

³ All significant results continue to hold at $p < 0.10$ if we eliminate data from the managers in our dataset. Additionally, including months' experience as a covariate does not impact our inferences.

⁴ The procedures identified during the planning discussion were: (1) tie out current projections by product to the DCF model, (2) perform a lookback analysis, (3) corroborate the projections with someone outside of accounting, (4) perform a sensitivity analysis, (5) review the industry outlook and macro-economic indicators, and (6) review the company's analysis of its growth rate compared to a peer group of firms.

⁵ Auditors could select an unlimited number of procedures and could select procedures multiple times. We expected them to naturally balance performing a quality audit of the projections with quickly completing the testing.

⁶ On the first iteration, we randomized the order in which we presented the 12 audit procedures. On all future iterations, we presented the audit procedures in their initial order.

FIGURE 1
Task Overview

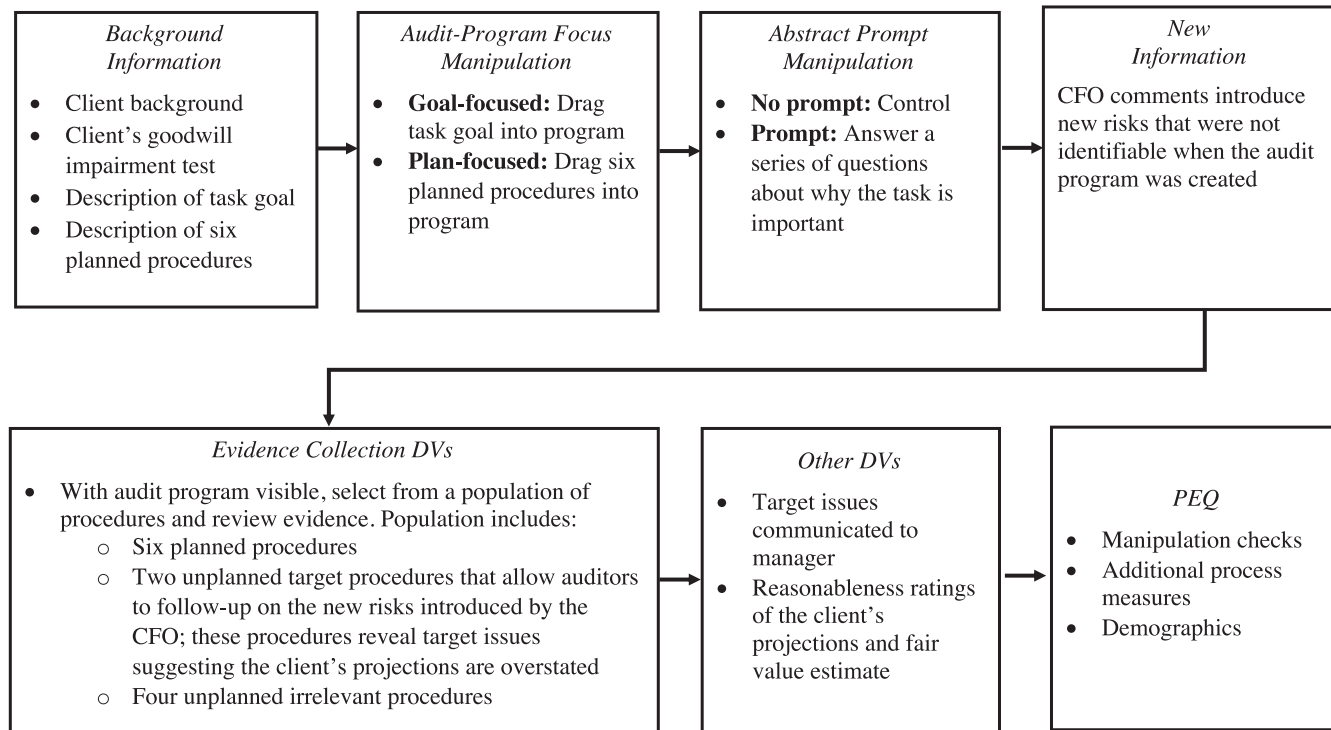


Figure 1 provides an overview of our task, which was administered online. Auditors evaluated the reasonableness of the client's revenue projections, a key input to a fair value estimate used in the client's goodwill impairment task.

risks seeded in the CFO's comments (i.e., "Review analyst coverage of the competitor" and "Inquire with production about its production schedule"), and four unplanned *irrelevant procedures* that focused on accounts receivable. The labels assigned to the target procedures were sufficient to imply that these procedures would reveal information about the seeded risks, creating an opportunity for auditors to deviate from their plans. While selecting procedures, auditors could return to information provided earlier.

Auditors who selected the planned procedures received additional cues related to the risks introduced by the CFO. These procedures revealed that there was a marketing backup plan in place in case of a delay in the new product release, that the company's ability to pass the step one test was sensitive to changes in the revenue projections, and that the client's expected growth rate was higher than all its peers except the one with the competing product. We designed this evidence to be consistent with aggressive revenue projections, but open to interpretation and not clearly diagnostic of a problem. The sensitivity cue also allowed auditors to infer whether their concerns with the revenue projections would impact the reasonableness of the fair value. Auditors who followed up on the newly introduced risks by selecting target procedures received evidence strongly suggesting that the revenue projections were overstated. That is, the target procedures revealed two *target issues*: (1) analyst coverage of the competitor revealed that the competitor's new product would beat the client's to market and (2) inquiring with production revealed that the production manager was skeptical about the client's ability to achieve a timely release of the new product due to a history of production problems and an unresolved supply chain issue.

Once auditors indicated that they were finished testing the projections, they described any additional procedures they wanted to perform. Next, they assessed the reasonableness of the revenue projections and the fair value, chose which action they would like to take next, and listed any issues they would like to discuss with their manager. Finally, auditors completed a post-experimental questionnaire containing manipulation checks and demographic questions.⁷

⁷ Once auditors indicated they were finished testing the projections, they could no longer view the evidence they examined. Thus, the judgments and decisions they made after evidence collection were based on their memory of the evidence they chose to examine. This is one of many differences between our instrument and those used in prior studies (e.g., Griffith et al. 2015b; Austin et al. 2020; Kadous and Zhou 2019).

Independent Variables

We manipulated two independent variables between participants: audit-program focus and abstract prompt. We manipulated audit-program focus at two levels (plan-focused versus goal-focused). All auditors reviewed information about the goal of their task (i.e., to evaluate the reasonableness of the revenue projections) and the planning discussion that yielded the six planned procedures. We focused plan-focused auditors on completing the planned procedures by having them drag each of the six planned procedures into the audit program; we focused goal-focused auditors on their goal by having them drag the goal of their task into the audit program (see Appendix B). To increase the salience of the audit program manipulation, we also reproduced auditors' audit programs on their screens while they were selecting audit procedures.

We also manipulated at two levels the presence of a prompt to think abstractly about why the task is important (no prompt versus abstract prompt). Our prompt is based on a manipulation developed by Freitas, Gollwitzer, and Trope (2004) that has been used in prior research on planning (e.g., Wieber et al. 2014, Bayuk et al. 2010). After creating their audit program and before reviewing the CFO's comments, we asked auditors receiving the prompt to describe a reason why it is important to test the revenue projections. On the next screen, we displayed their initial response and asked them to explain why their initial response is important (i.e., "You wrote '*initial response*.' Why is this important?"). Finally, on a third screen, we asked auditors to repeat this process once more. This exercise prompts auditors to think more abstractly about the importance of their task and, thus, activates their higher-level goals (e.g., detecting misstatements in the financial statements), which are broader than the task goal.

Dependent Variables

We measure three primary dependent variables. Our first dependent variable is the number of target procedures auditors select, which by design, ranges from 0 to 2.⁸ We use this measure to test H1 and H2. A higher number of target procedures selected indicates more effective evidence collection. Our second dependent variable is the number of target issues auditors want to discuss with their manager. After collecting evidence, we asked auditors to decide what they would like to do next regarding the fair value: (1) conclude the fair value is reasonable, (2) delay forming a conclusion until they can talk to their manager, (3) call their manager immediately, and (4) conclude the fair value is materially overstated. We then asked auditors to describe the reasons for their conclusion or the specific issues they want to discuss with their manager. We used this procedure to elicit issues that auditors wanted to discuss with their manager because prior research has shown that auditors overwhelmingly want to talk with their manager before reaching a final conclusion (i.e., auditors overwhelmingly choose the second or third option; cf. Griffith et al. 2015b; Austin et al. 2020).

We code the issues auditors list into five categories: (1) target issues, (2) sensitivity issues, (3) other concerns, (4) supporting items, and (5) other items. Target issues discuss the potential for the competing product to beat the client's product to the market, the production problems with the client's product, or closely related issues that provide context for these issues. Sensitivity issues focus on the sensitivity of the fair value to changes in the revenue projections. Other concerns focus on concerns about the revenue projections or the fair value that are not related to the target or sensitivity issues. Supporting items state or imply support for the reasonableness of the client's numbers. Other items are irrelevant, vague, or too far removed from the current task to be included in an above category.⁹

An author who was blind to condition and a research assistant who was blind to the research question and condition coded the issues data and all data for this experiment. The coders reconciled 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 analysis. The coders' initial agreement rate is 85.02 percent, which is reliably better than chance (Cohen's Kappa = 0.761, $p < 0.001$).

Finally, we ask auditors to assess the reasonableness of both the revenue projections and of the fair value on 11-point Likert scales anchored by 0 (not at all reasonable) and 10 (extremely reasonable). We use the total number of target issues auditors want to discuss with their manager and their reasonableness assessments to test H3 and H4. A higher number of target issues and lower reasonableness assessments are consistent with better performance.

⁸ For this measure, and all other measures involving counts of the number of procedures selected, we do not include repeated selections of the procedures in our measures.

⁹ Examples of target issues include "potential that GOL is coming to the market with their new product next month, which would inherently devalue the assumption of management that they will be the 'first mover . . .'" and "The concerns about receiving key components of the product and the possibility of a delayed launch also trigger an issue." Examples of sensitivity issues include "Further, the FV vs. BV, as currently presented by management, is relatively close. And as we saw in the sensitivity analysis, a mere .5% decrease in the growth rate has a significant impact on projections and even suggests that goodwill may be impaired . . ." Examples of other concerns include "The forecast of revenue might be too high given the current macroeconomic situation." Examples of supporting items include "Based on the discounted cash flow model and the projections, the fair value appears to approximate the book value such as to not indicate impairment" and "Revenue projections are reasonable." Examples of other items include "Large AR write off" and "I need to discuss with manager before I make the final decision."

IV. RESULTS

Manipulation Checks

To determine whether goal-focused auditors were more focused on the task goal of evaluating the revenue projections than plan-focused auditors, we asked auditors to report their commitment to achieving their goal of evaluating the reasonableness of the revenue projections on an 11-point Likert scale ranging from 0 (not at all committed) to 10 (extremely committed). Consistent with a successful manipulation, a planned contrast based on an ANOVA model (not tabulated) shows that goal-focused auditors are more committed to their goal (mean = 8.18) than plan-focused auditors (mean = 7.56; $t_{118} = 2.00$, $p = 0.024$, one-tailed).¹⁰

To evaluate whether auditors who received the abstract prompt represented their task more abstractly than auditors who did not, we asked all auditors the following question in the post-experimental questionnaire: "Imagine you are speaking with a friend who doesn't know what an audit is. How would you describe the task you just performed to them?" We examined how auditors described their task and we coded their responses into three categories: (1) low-level purpose—focused exclusively on auditing the revenue projections or how they performed this task; (2) moderate-level purpose—linked the task of auditing the revenue projections to the goal of evaluating the fair value estimate, goodwill, or the goodwill impairment test; and (3) high-level purpose—linked the task of auditing the revenue projections to the broader goal of identifying material misstatements or ensuring financial statement users receive reliable information. The coders' initial agreement rate was 80.31 percent and Cohen's Kappa is 0.684 ($p < 0.001$).

Using the final coded data, we compute a mean abstractness rating for each condition. Items coded as low, moderate, and high-level purpose are coded as 1, 2, and 3, respectively. An ordinal logistic model (not tabulated) reveals that, consistent with expectations, auditors who receive the prompt describe a higher-level purpose (mean = 1.86) than auditors who do not (mean = 1.66, $Z = 1.78$, $p = 0.037$, one-tailed). Thus, as expected, the abstract prompt encouraged auditors to think about the broader importance of their task.¹¹

Hypotheses Testing—Evidence Collection

Hypothesis 1 predicts that goal-focused auditors will be more likely to collect relevant, previously unplanned evidence than plan-focused auditors. We test H1 by examining the number of target procedures auditors select. Table 1 provides descriptive statistics for the number of target, planned, and irrelevant procedures auditors select (Panel A), a Poisson loglinear model on the number of target procedures (Panel B), and planned contrasts based on our Poisson model (Panel C). As expected, goal-focused auditors select more target procedures (mean = 1.20) than plan-focused auditors (mean = 0.67, $Z = 2.95$, $p = 0.002$, one-tailed).¹² This supports H1; goal-focused audit programs increase the likelihood that auditors collect relevant evidence that could not be identified when the audit program was created.

Hypothesis 2 predicts that plan-focused auditors who think abstractly will be more likely to collect relevant, previously unplanned audit evidence than plan-focused auditors who do not. We test H2 by examining the simple effect of the abstract prompt on the number of target procedures within the plan-focused condition. Table 1 (Panel C) provides the relevant contrast. Contrary to expectations, plan-focused auditors who think abstractly do not select significantly more target procedures (mean = 0.68) than plan-focused auditors who do not (mean = 0.65; $Z = 0.11$, $p = 0.456$, one-tailed). This does not support H2; abstract thinking does not overcome the effects of using plan-focused audit programs.¹³

¹⁰ This analysis excludes data from one auditor who did not respond to the question. In all analyses in the paper, we include data from all auditors who responded to the variable under analysis, which accounts for the small differences in numbers of observations across analyses performed. We use one-tailed tests for directional predictions. Unless otherwise indicated, tests are two-tailed.

¹¹ We also verified that auditors followed instructions when responding to the prompt itself. We expected the prompt to cause auditors to think about their broader audit quality goals, such as identifying material misstatements in the financial statements or ensuring financial statement users receive reliable information. Auditors' responses to the prompt suggest that approximately 56.3 percent of auditors who received the prompt were focused on these broader goals at the end of the exercise. The remaining auditors were focused on related, but slightly lower-level goals, such as evaluating the reasonableness of the fair value estimate, goodwill, or the client's goodwill impairment test (34.4 percent), remained narrowly focused on auditing the revenue projections (6.2 percent), or were focused on other goals (3.1 percent). This suggests that the majority of auditors followed instructions.

¹² We also perform this analysis separately for each target procedure using binary logistic models (not tabulated). Goal-focused auditors are more likely to review analyst coverage of the competitor (mean = 71 percent) than plan-focused auditors (mean = 40 percent; $Z = 3.53$, $p < 0.001$, one-tailed) and are more likely to inquire with production (mean = 63 percent) than plan-focused auditors (mean = 39 percent, $Z = 2.73$, $p = 0.003$, one-tailed).

¹³ Auditors could describe additional procedures they wanted to perform. Only 32 of 123 auditors describe additional procedures; the number of additional procedures written does not differ across conditions (main effect and interaction p 's all > 0.193). We code these procedures into two categories: (1) diagnostic procedures that would provide evidence about the target issues and (2) non-diagnostic procedures. The coders' initial agreement rate is 95.45 percent and Cohen's Kappa is 0.891 ($p < 0.001$). Only 14 of 123 auditors describe diagnostic procedures. A Poisson loglinear model on the number of diagnostic procedures shows no significant main effect of audit-program focus ($\chi_1^2 = 0.20$, $p = 0.658$) or abstract prompt ($\chi_1^2 = 1.15$, $p = 0.284$), but a significant interaction ($\chi_1^2 = 5.40$, $p = 0.025$). Within the goal-focused condition, auditors who receive the abstract prompt write fewer diagnostic procedures (mean = 0.03) than auditors who do not (mean = 0.27, $\chi_1^2 = 6.64$, $p = 0.010$). Given the small number of auditors who wrote diagnostic procedures, we caution against drawing inferences from this evidence.

TABLE 1
Audit Procedures

Panel A: Audit Procedures—LS Mean (SE) [n]

<u>Abstract Prompt</u>	<u>Audit-Program Focus:</u>		<u>Mean</u>
	<u>Plan-Focused</u>	<u>Goal-Focused</u>	
No Prompt			
Target	0.65 (0.16)	1.33 (0.20)	0.93 (0.13)
Planned	5.46 (0.46)	5.21 (0.40)	5.34 (0.30)
Irrelevant	0.69 (0.16)	0.97 (0.17)	0.82 (0.12)
[n]	[26] A	[33] B	[59]
Abstract Prompt			
Target	0.68 (0.16)	1.08 (0.17)	0.86 (0.12)
Planned	5.04 (0.42)	4.64 (0.36)	4.83 (0.28)
Irrelevant	0.79 (0.17)	0.64 (0.13)	0.71 (0.11)
[n]	[28] C	[36] D	[64]
Mean			
Target	0.67 (0.11)	1.20 (0.13)	
Planned	5.24 (0.31)	4.92 (0.27)	
Irrelevant	0.74 (0.12)	0.79 (0.11)	
[n]	[54]	[69]	

Panel B: Target Procedures—Poisson Loglinear Regression

<u>Source of Variation</u>	<u>df</u>	<u>χ^2</u>	<u>p-value</u>
Audit-program focus	1	8.72	0.003
Abstract prompt	1	0.18	0.670
Audit-program focus \times Abstract prompt	1	0.38	0.540

Panel C: Target Procedures—Planned Contrasts Based on Poisson Loglinear Regression

	<u>Z</u>	<u>One-Tailed p-value</u>
Test of H1: $(B + D)/2 > (A + C)/2$	2.95	0.002
Test of H2: $C > A$	0.11	0.456

Table 1 reports statistics for the number of target, planned, and irrelevant audit procedures auditors select. *Audit-program focus* is manipulated at two levels. Auditors in the plan-focused condition produce an audit program that includes the six procedures they planned with their manager. Auditors in the goal-focused condition produce an audit program that includes the goal of their task. *Abstract prompt* is manipulated at two levels. Auditors in the abstract prompt condition receive an intervention that prompts them to think abstractly about why their task is important. Auditors in the no prompt condition do not receive this intervention. *Target Procedures* is the number out of two possible procedures that auditors select that are relevant to the revenue projections but had not been planned. *Planned Procedures* is the number out of six possible procedures auditors select that they planned with their manager. *Irrelevant Procedures* is the number out of four possible procedures that auditors select that focus on the valuation of accounts receivable.

Hypotheses Testing—Judgment and Decision Performance

Hypothesis 3 predicts that goal-focused auditors will follow up on evidence that contradicts management's estimate more effectively than plan-focused auditors. We first test H3 by examining the number of target issues that auditors want to discuss with their manager.^{14,15} These issues are important because preparing information for supervisor review and communicating potential issues to their supervisors map well to the task auditors perform in practice (Griffith et al. 2015a). Further, since supervisors are influenced by the mix of evidence provided by their subordinates (e.g., Agoglia et al. 2003), the issues auditors communicate have implications for audit quality. Table 2 provides descriptive statistics for target issues (Panel A), an ANOVA model on target issues (Panel B), and planned contrasts (Panel C). As expected, goal-focused auditors describe significantly more target issues (mean = 1.08) than plan-focused auditors (mean = 0.62; $t_{114} = 2.37$, $p = 0.010$, one-tailed). This supports H3.^{16,17}

Hypothesis 3 also predicts that goal-focused auditors will make higher quality judgments than plan-focused auditors. Thus, we examine auditors' judgments of the reasonableness of the revenue projections and the fair value. These judgments are clean measures of auditors' level of comfort with the estimates but, unlike target issues, do not capture auditors' critical thinking (e.g., what auditors are concerned about and what they would do; Austin et al. 2020). Table 3 provides descriptive statistics for auditors' judgments (Panel A), ANOVAs for each of the two judgments (Panels B and C, respectively), and planned contrasts for each of the two judgments (Panels D and E, respectively). Planned contrasts show that goal-focused auditors do not evaluate the revenue projections as significantly less reasonable (mean = 5.60) than plan-focused auditors (mean = 5.70, $t_{118} = 0.32$, $p = 0.375$, one-tailed) and do not evaluate the fair value as significantly less reasonable (mean = 5.42) than plan-focused auditors (mean = 5.68, $t_{118} = 0.80$, $p = 0.213$, one-tailed). Although goal-focused auditors are more likely to select the target procedures, obtain the target evidence, and communicate the target issues to their manager, their reasonableness ratings do not reflect significantly more concern than those of plan-focused auditors.¹⁸ We next perform two additional analyses related to auditors' reasonableness judgments.

Reasonableness of the fair value, conditional on attention to the sensitivity information. Concern about the reasonableness of the fair value stems from a pattern of problematic evidence. In order to fully appreciate the implications of the target evidence for the reasonableness of *the fair value*, auditors need to combine the target evidence with a sensitivity analysis showing that the fair value is highly sensitive to small changes in the revenue projections (i.e., evidence from one of the planned procedures). However, auditors had to select the sensitivity analysis from the possible procedures and not all auditors examined this analysis or processed it deeply. This likely explains why studies using significant variations of our instrument (Griffith et al. 2015a, Kadous and Zhou 2019), which gave participants salient access to sensitivity information, find significant effects on reasonableness assessments.

We consider *ex post* whether the fair value judgments decrease (i.e., improve) if we focus on auditors who were more attentive to the sensitivity analysis. As shown in Table 4, there is a steady increase in the difference between goal-focused and plan-focused auditors' reasonableness judgments as auditors' attention to the sensitivity analysis increases. Further, when we exclude auditors who did not select the sensitivity procedure and auditors who quickly examined the sensitivity analysis (i.e., auditors in the bottom quartile of time spent [< 12 seconds] examining this analysis), we find that goal-focused auditors judge the fair value as significantly less reasonable (mean = 5.01) than plan-focused auditors (mean = 5.80, $t_{76} = 1.85$, $p = 0.034$,

¹⁴ Given that our target issues are not substitutes for one another, reporting more target issues is better. When auditors report more target issues, their manager has a more complete set of information on which to base judgments. Thus, we analyze the mean target issues, rather than the ratio of target issues to target procedures.

¹⁵ Eighty-five percent of auditors decided to talk to their manager: 41.5 percent decided to delay forming a conclusion until they could talk to their manager, 43.9 percent decided to call their manager immediately, and 14.6 percent concluded that the fair value was reasonable. We find no differences across conditions in these decisions.

¹⁶ This result is driven primarily by the simple effect of audit program-focus within the no prompt condition (one-tailed $p = 0.006$) rather than the simple effect of audit program-focus within the abstract prompt condition (one-tailed $p = 0.242$), although the ANOVA interaction is not significant. The effect is weaker in the abstract prompt condition because, as discussed in supplemental analyses, the abstract prompt appears to marginally interfere with the effectiveness of the goal-focused program. Importantly, the simple effect of audit-program focus within the no prompt condition is a clean test of our theory about audit program-focus because it examines audit program-focus in a setting where our abstract thinking intervention does not exert any moderating effects.

¹⁷ Further supporting H3, inferences are unchanged if we use an alternative measure that counts the number of target *and* sensitivity issues auditors want to discuss with their manager. Untabulated analyses also show that goal-focused auditors are more likely to return to prior case information while selecting procedures and examining evidence. Goal-focused auditors are more likely to return to the company background information (mean = 20 percent) than plan-focused auditors (mean = 5 percent, $Z = 2.48$, $p = 0.007$, one-tailed) and are marginally more likely to return to the step one analysis and discounted cash flow model (mean = 29 percent) than plan-focused auditors (mean = 17 percent, $Z = 1.53$, $p = 0.064$, one-tailed). This suggests that goal-focused auditors are more likely to follow up on evidence contradicting management's estimate by integrating it with existing information.

¹⁸ Target issues communicated are significantly negatively correlated with reasonableness of the revenue projections ($r = -0.222$, $p = 0.016$). Thus, an untabulated path model, which demonstrates good fit, suggests that the effect of audit program focus on target issues flows through to auditors' reasonableness ratings. Target issues communicated are not significantly negatively correlated with the reasonableness of the fair value ($r = -0.111$, $p = 0.232$).

TABLE 2
Target Issues to Discuss with Manager

Panel A: Target Issues—LS Mean (SE) [n]

Abstract Prompt	Audit-Program Focus		Mean
	Plan-Focused	Goal-Focused	
No Prompt	0.60 (0.21) [25] A	1.33 (0.19) [30] B	0.97 (0.14) [55]
Abstract Prompt	0.64 (0.20) [28] C	0.83 (0.18) [35] D	0.74 (0.13) [63]
Mean	0.62 (0.14) [53]	1.08 (0.13) [65]	

Panel B: Target Issues—ANOVA Table

Source of Variation	df	MS	F	p-value
Audit-program focus	1	6.14	5.64	0.019
Abstract prompt	1	1.55	1.43	0.235
Audit-program focus × Abstract prompt	1	2.18	2.00	0.160
Error	114	1.09		

Panel C: Target Issues—Planned Contrasts Based on ANOVA

	t_{114}	One-Tailed p-value
Test of H3: $(B + D)/2 > (A + C)/2$	2.37	0.010
Test of H4: $C > A$	0.15	0.441

Table 2 reports the results for the total number of target issues that auditors want to discuss with their manager. See Table 1 for an explanation of the independent variables. *Target Issues* represents the number of issues that auditors want to discuss with their manager that focus on the key evidence revealed by the relevant, but unplanned, target procedures and closely related evidence.

one-tailed).¹⁹ While this *ex post* analysis should be interpreted cautiously, it suggests that goal-focused auditors can make higher quality judgments than plan-focused auditors when auditors are better equipped to recognize a problematic pattern of evidence.

Downstream effect of seniors' evidence collection on managers' reasonableness judgments. We conduct a small follow-up experiment to examine whether goal-focused seniors' superior evidence acquisition and communication can improve the quality of supervising *managers'* reasonableness judgments. Experienced managers and above ($n = 40$) evaluated the reasonableness of the revenue projections using the same case background and evidence used in our main study.^{20,21} In order to

¹⁹ Once auditors selected a procedure, they were required to stay on the evidence screen for ten seconds. Thus, the bottom quartile of time spent likely includes some who quickly “clicked through” the information.

²⁰ We eliminated data from the following 14 auditors, although except where noted inferences are unchanged and significant results continue to hold at $p < 0.10$ if we use data from all 54 auditors who finished the study: one senior who does not have the experience necessary, six newly promoted managers (i.e., those with 60 months' experience) whose experiences are likely similar to those of the auditors in our main study, and seven highly inattentive auditors who do not appear to have read the case materials. These seven inattentive auditors include: (1) four who spent less than one minute examining all the evidence in the study (retained auditors spent a median of seven minutes) and (2) three who incorrectly answered all three post-experimental comprehensive check questions; their inattention is corroborated by the fact that they spent fewer than ten seconds on screens containing key case information.

²¹ We made two minor modifications to update the materials. First, we modified the tax rate in the DCF model to reflect the 2018 change to the statutory rate. Second, we made slight changes to the GDP figures in the “industry outlook and macro-economic indicators” evidence item based on current data. All managers receive the same DCF and the same GDP figures, so these modifications are unlikely to drive differences across conditions.

TABLE 3
Reasonableness Judgments

Panel A: Reasonableness Judgments—LS Mean (SE) [n]

Abstract Prompt	Audit-Program Focus		Mean
	Plan-Focused	Goal-Focused	
No Prompt			
Revenue Projections	5.42 (0.35) [26] A	5.63 (0.31) [33] B	5.52 (0.23) [59]
Fair Value	5.59 (0.34) [26] A	5.49 (0.31) [33] B	5.54 (0.23) [59]
Abstract Prompt			
Revenue Projections	5.99 (0.34) [28] C	5.57 (0.30) [35] D	5.78 (0.23) [63]
Fair Value	5.76 (0.33) [28] C	5.35 (0.30) [35] D	5.56 (0.22) [63]
Mean			
Revenue Projections	5.70 (0.24) [54]	5.60 (0.22) [68]	
Fair Value	5.68 (0.24) [54]	5.42 (0.21) [68]	

Panel B: Reasonableness Revenue Projections—ANOVA Table

Source of Variation	df	MS	F	p-value
Audit-program focus	1	0.33	0.10	0.749
Abstract prompt	1	1.95	0.61	0.435
Audit-program focus × Abstract prompt	1	3.13	0.98	0.324
Error	118	3.19		

Panel C: Reasonableness Fair Value—ANOVA Table

Source of Variation	df	MS	F	p-value
Audit-program focus	1	1.96	0.64	0.426
Abstract prompt	1	<0.01	<0.01	0.971
Audit-program focus × Abstract prompt	1	0.74	0.24	0.624
Error	118	3.06		

Panel D: Reasonableness Revenue Projections—Planned Contrast Based on ANOVA

	t_{118}	One-Tailed p-value
Test of H3: $(B + D)/2 < (A + C)/2$	0.32	0.375
Test of H4: $C < A$	1.19	0.881

Panel E: Reasonableness Fair Value—Planned Contrast Based on ANOVA

	t_{118}	One-Tailed p-value
Test of H3: $(B + D)/2 < (A + C)/2$	0.80	0.213
Test of H4: $C < A$	0.35	0.638

(continued on next page)

TABLE 3 (continued)

Table 3 reports the results for auditors' judgments of the reasonableness of the revenue projections and fair value. See Table 1 for an explanation of the independent variables. *Reasonableness Revenue Projections* and *Reasonableness Fair Value* are measured on 11-point Likert scales ranging from 0 (not at all reasonable) to 10 (extremely reasonable). Lower values are indicative of higher judgment quality.

evaluate the projections and the related fair value, managers reviewed evidence collected by their senior. We manipulate the evidence the managers receive from their senior at two levels (target evidence absent versus present). Managers in the absent condition received evidence from the six planned procedures in our main study. Managers in the present condition received these same six items plus evidence from the two target procedures in our main study. Managers judged the reasonableness of the projections and fair value using the same Likert scales in our main study. Managers also responded to an open-ended question asking them to describe their primary concerns about the revenue projections or fair value. We coded managers'

TABLE 4
Ex Post Analysis of Fair Value Judgments
 LS Mean (SE) [n]

Attention to Sensitivity Information	Audit-Program Focus		Difference	t-stat	One-Tailed p-value
	Plan-Focused	Goal-Focused			
Full Sample— whether viewed or not	5.68 (0.24) [54]	5.42 (0.21) [68]	−0.26	0.80	0.213
Viewed ^a	5.71 (0.26) [48]	5.37 (0.24) [57]	−0.34	0.94	0.175
Viewed >11s	5.75 (0.27) [47]	5.29 (0.25) [53]	−0.46	1.25	0.107
Viewed >12s ^b	5.80 (0.32) [34]	5.01 (0.28) [46]	−0.79	1.85	0.034
Viewed >13s	5.77 (0.36) [28]	4.97 (0.29) [42]	−0.80	1.72	0.045
Viewed > 14s	5.76 (0.37) [27]	4.93 (0.30) [41]	−0.83	1.72	0.045
Viewed > 15s	5.80 (0.39) [25]	4.84 (0.31) [35]	−0.96	1.93	0.029
Viewed > 16s	5.85 (0.39) [23]	4.74 (0.31) [34]	−1.11	2.24	0.015
Viewed > 17s ^c	5.78 (0.40) [22]	4.72 (0.33) [31]	−1.06	2.05	0.023

Table 4 reports the results for auditors' judgments of the reasonableness of the fair value, conditional on auditors' attention to information indicating that the fair value was highly sensitive to small changes in the revenue projections. Auditors' fair value judgments are measured on 11-point Likert scales ranging from 0 (not at all reasonable) to 10 (extremely reasonable). Lower values are indicative of higher judgment quality.

^a Excludes auditors who did not select the sensitivity procedure.

^b Excludes auditors who did not select the sensitivity procedure and those in the bottom quartile of time spent examining the sensitivity analysis.

^c Excludes auditors who did not select the sensitivity procedure and those in the bottom half of time spent examining the sensitivity analysis.

See Table 1 for an explanation of the independent variables.

responses to this question into three categories: (1) overall supportive of management's position, (2) overall neutral, (3) overall critical of management's position.²²

We find that managers who receive the target evidence rate the revenue projections as significantly less reasonable (mean = 3.68) than managers who do not (mean = 4.71, $t_{38} = 1.91$, $p = 0.032$, one-tailed). Managers' judgments of reasonableness of the fair value follow a similar trend, but the difference across conditions is not significant (mean present = 3.89 and mean absent = 4.29, $t_{38} = 0.70$, $p = 0.246$, one-tailed).²³ Further, analysis of managers' open-ended responses suggests that managers who receive the target evidence are significantly more critical of management's position (mean = 2.94) than managers who do not (mean = 2.62, $Z = 2.09$, $p = 0.019$, one-tailed). Taken together, this provides evidence that senior auditors' superior collection of evidence can have downstream effects on managers' judgment quality.

To summarize, our data support H3. Goal-focused auditors follow up more effectively than plan-focused auditors. Although our main tests do not demonstrate an effect of program-focus on senior auditors' own reasonableness judgments, our two additional analyses suggest that goal-focused programs can improve audit judgment quality.

Hypothesis 4 predicts that plan-focused auditors who think abstractly will follow up on evidence that contradicts management's estimate more effectively and make higher quality judgments than plan-focused auditors who do not. We first test H4 by examining the simple effect of the abstract prompt on the number of target issues within the plan-focused condition. Table 2 (Panel C) provides the relevant contrast. Contrary to expectations, plan-focused-auditors who think abstractly do not communicate significantly more target issues to their manager (mean = 0.64) than plan-focused auditors who do not (mean = 0.60; $t_{114} = 0.15$, $p = 0.441$, one-tailed). Similarly, plan-focused auditors who think abstractly do not evaluate the revenue projections as less reasonable (mean = 5.99) than plan-focused auditors who do not think abstractly (mean = 5.42, $t_{118} = 1.19$, $p = 0.881$, one-tailed) and do not evaluate management's estimate of the fair value as less reasonable (mean = 5.76) than plan-focused auditors who do not think abstractly (mean = 5.59, $t_{118} = 0.35$, $p = 0.638$, one-tailed). This does not support H4.

Supplemental Analyses

Process Measures and Mediation

Theory predicts that people with a general goal will show heightened attention to unplanned opportunities to achieve their goal (Parks-Stamm et al. 2007; Masicampo and Baumeister 2012). Thus, we expect that goal-focused auditors will be more likely than plan-focused auditors to notice the seeded risks contained in the CFO's comments about the projections. Post-experiment, we asked auditors two surprise recall multiple choice questions about the CFO's comments. Auditors could not return to the case while answering these questions, which measure whether the auditors recall that the company moved up the new product planned release date and that a competitor was developing a competing product. We sum the number of correct answers to construct a measure of auditors' attention to the seeded risks. Consistent with our theory, goal-focused auditors correctly recalled more seeded risks (mean = 1.32) than plan-focused auditors (mean = 0.93, $Z = 2.07$, $p = 0.020$, one-tailed).

In addition, theory predicts that people with specific plans will devalue unplanned opportunities to achieve their goal, *even if* they notice the opportunities (Bayuk et al. 2010). Thus, we expect that after controlling for auditors' attention to the seeded risks contained in the CFO's comments, goal-focused auditors should still be more likely to follow up on these risks than plan-focused auditors. We run a Poisson model on the number of target procedures selected while controlling for the sum of auditors' correct answers to the surprise recall questions. The covariate is significant ($\chi_1^2 = 6.04$, $p = 0.014$), and goal-focused auditors still select more target procedures (mean = 1.11) than plan-focused auditors (mean = 0.69 percent, $Z = 2.44$, $p = 0.008$, one-tailed). Thus, consistent with our theory, goal-focused auditors perform a more effective information search because they are more attentive to new risks that emerge after the audit plan has been set and because they are more willing to take action when they notice these risks.^{24,25}

²² Coders were blind to condition and had an initial agreement rate of 84 percent, which is better than chance ($p < 0.001$).

²³ An untabulated path model, which demonstrates good fit, provides evidence of an *indirect* effect of the target evidence on managers' perceptions of the reasonableness of the fair value through its effect on the reasonableness of the revenue projections ($p = 0.020$, one-tailed). Significance weakens if we include the inattentive auditors' data who completed the follow-up study ($n = 54$, $p = 0.104$, one-tailed).

²⁴ Consistent with this analysis, an untabulated path model shows that auditors' recall of the seeded risks partially mediates the relationship between audit program-focus and auditors' selection of target procedures. The model fits the data well ($\chi_2^2 = 0.74$, $p = 0.691$; CFI = 1.00; RMSEA = 0.00). The indirect path from audit-program focus to target procedures through auditors' recall of the seeded risks is significant ($p = 0.033$) and is consistent with our theory that a goal-focus operates by increasing auditors' attention to the seeded risks. The direct path from audit-program focus to target procedures also remains significant ($p = 0.007$) and is consistent with our expectation that, controlling for auditors' attention to the seeded risks, goal-focused auditors are still more likely to take action because they are less likely to devalue unplanned opportunities to effectively perform their task.

²⁵ We further distinguish our goal-focus construct from abstract thinking by noting that goal-focused programs do not increase abstract thinking. In fact, goal-focused auditors think *less* abstractly (mean abstractness = 1.64) than plan-focused auditors (mean abstractness = 1.93, $\chi_1^2 = 5.42$, $p = 0.020$). We also acknowledge that plan-focused auditors may have felt less responsible for performing unplanned procedures than goal-focused auditors. While this is consistent with the devaluation mechanism, future studies could consider the role of responsibility more directly.

Performance of Planned Audit Procedures

Since people with specific plans show heightened attention to the goal pursuit opportunities specified in their plans and automatically initiate planned actions (Gollwitzer 1999; Gollwitzer et al. 2004; Gollwitzer and Sheeran 2006), we consider whether plan-focused auditors are more likely to select the six planned audit procedures than are goal-focused auditors. We did not necessarily expect goal-focused auditors to neglect the planned audit procedures because these procedures are goal-relevant. Table 1 (Panel A) reports the number of planned procedures selected across conditions. A Poisson loglinear model (not tabulated) shows that the number of planned procedures plan-focused auditors select (mean = 5.24) is not significantly different from the number goal-focused auditors select (mean = 4.92, $\chi_1^2 = 0.64$, $p = 0.425$).²⁶

Performance of Irrelevant Audit Procedures

One concern with moving away from plan-focused audit programs is that auditors without a detailed guide might inefficiently choose to perform irrelevant procedures. We did not expect this to be the case because our theory predicts that having a general task goal should only increase the likelihood that they perform goal-relevant procedures. To test this expectation, we count the number of irrelevant procedures auditors select and we report these data in Table 1 (Panel A). A Poisson loglinear model (not tabulated) shows that the number of irrelevant procedures that goal-focused auditors select (mean = 0.79) is not significantly different from the number that plan-focused auditors select (mean = 0.74, $\chi_1^2 = 0.10$, $p = 0.755$). Thus, goal-focused auditors do not appear to be less efficient than plan-focused auditors.

Analysis of Rote Information Search Behavior

We examine the extent to which plan-focused auditors adhere to the plan-focused program in a rote fashion. We find that 24 of 54 plan-focused auditors (44.4 percent), but only 11 of 69 goal-focused auditors (15.9 percent), limit their information search to planned procedures. This difference is statistically meaningful ($\chi_1^2 = 12.90$, $p < 0.001$). Further, of the 24 plan-focused auditors that select only planned procedures, 19 (79.2 percent) select all six of the planned procedures and, despite the fact that we presented the procedures in a random order, nine (47.4 percent) of these auditors select the six procedures in the order that they were listed on the plan-focused audit program. In contrast, of the 11 goal-focused auditors that select only planned procedures, only three (27.3 percent) select all six of the procedures and none of these auditors select the six procedures in the order that they were listed on the plan-focused audit program. Again, these differences are statistically meaningful (select all six procedures $\chi_1^2 = 19.96$, $p < 0.001$, and in order $\chi_1^2 = 9.60$, $p = 0.002$, respectively). Together, this suggests that plan-focused auditors are more likely to search for evidence in a rote fashion than goal-focused auditors.

Task Difficulty and Effort

We examine whether goal-focused auditors worked harder than plan-focused auditors. We asked auditors to report how hard they worked on the task on a scale ranging from 0 (not at all hard) to 10 (extremely hard) and how difficult they perceived the task on a scale ranging from 0 (not at all difficult) to 10 (extremely difficult). Goal-focused auditors do not report working significantly harder (mean = 6.29) than plan-focused auditors (mean = 6.08, $F_{1, 114} = 0.25$, $p = 0.619$), do not report that their task is significantly more difficult (mean = 5.48) than plan-focused auditors (mean = 5.19, $F_{1, 103} = 0.59$, $p = 0.446$), do not spend significantly more time on the task (mean = 32.7 minutes) than plan-focused auditors (mean = 30.3 minutes, $F_{1, 107} = 1.11$, $p = 0.294$), and do not select significantly more total procedures (mean = 6.7) than plan-focused auditors (mean = 6.9, $F_{1, 119} = 0.39$, $p = 0.532$).²⁷ Overall, this suggests that goal-focused programs can increase audit quality without necessarily increasing effort.

Effect of the Abstract Prompt on Goal-Focused Auditors

We do not have a prediction about the impact of abstract thinking on goal-focused auditors. We observe *ex post* that goal-focused auditors who think abstractly do not select a different number of target procedures (mean = 1.08) than those who do not

²⁶ During evidence collection, goal-focused auditors could return to the planning discussion with their manager, which described the task goal and the six planned procedures. Goal-focused auditors were more likely to return to this information (mean = 38 percent) than plan-focused auditors (mean = 20 percent, $\chi_1^2 = 4.94$, $p = 0.026$). Thus, goal-focused auditors pursued their goal, in part, by ensuring they completed the planned procedures.

²⁷ The analysis of time excludes data from 12 participants for whom total time exceeds 60 minutes and, thus, likely includes idle time before participants received the manipulations. We continue to find no effect of audit program-focus on time if we exclude data from ten participants for whom total time exceeds 75 minutes ($p = 0.679$), if we exclude data from seven participants for whom total time exceeds 90 minutes ($p = 0.229$), and if we exclude data from four participants for whom total time exceeds 120 minutes ($p = 0.179$). Analysis based on our full sample is uninformative due to extreme outliers (i.e., four participants for whom total time exceeds 2, 6, 17, and 20 hours).

(mean = 1.33, $\chi_1^2 = 0.89$, $p = 0.346$). Further, goal-focused auditors who think abstractly report marginally fewer target issues (mean = 0.83) than those who do not (mean = 1.33, $F_{1, 114} = 3.78$, $p = 0.054$). Thus, if anything, thinking abstractly may interfere with the effects of goal-focused programs. While we caution against over-interpretation of a single, unpredicted result that is the second action in a logical sequence, we note that this result is consistent with Bayuk et al.'s (2010) concern that abstract thinking can lead to inaction when people are already focused on a general goal.

Effect of the Abstract Prompt on Plan-Focused Auditors

In this section, we consider support for four explanations for why the abstract prompt did not improve plan-focused auditor performance, despite a successful manipulation. First, it is possible that the abstract prompt wore off before it affected judgments. This is unlikely because, as we report with our manipulation checks, auditors who receive the abstract prompt respond to the post-experimental question about task purpose by describing higher-level goals than auditors who do not receive the prompt. Thus, the prompt appears to have had a lasting effect.

Second, it is possible that the abstract prompt was frustrating. This is unlikely because it does not appear that the prompt was overly burdensome or caused auditors to disengage. Auditors wrote an average of 65.2 words (median is 54) in response to the prompt. Auditors who receive the abstract prompt do not report working significantly harder (mean = 6.13) than auditors who do not receive the prompt (mean = 6.24, $F_{1, 114} = 0.07$, $p = 0.795$), do not report that their task was significantly more difficult (mean = 5.42) than auditors who do not receive the prompt (mean = 5.25, $F_{1, 103} = 0.20$, $p = 0.658$), and do not spend a different amount of time on the task (mean = 32.4 minutes) than auditors who do not receive the prompt (mean = 30.6 minutes, $F_{1, 107} = 0.62$, $p = 0.434$).²⁸ Further, of the 49 incomplete instruments we received, only three auditors dropped out immediately after we asked them to respond to the prompt. Taken together, this is inconsistent with a frustration argument.

A third possibility is that the abstract prompt was ineffective because thinking about higher-level goals distracts auditors from their main task. We see no evidence of this. Specifically, plan-focused auditors who receive the prompt are not more likely to select irrelevant procedures (mean = 0.79) than those who do not (mean = 0.69, $\chi_1^2 = 0.16$, $p = 0.690$) and are not more likely to write additional non-diagnostic procedures (mean = 0.36) than those who do not (mean = 0.42; $\chi_1^2 = 0.15$, $p = 0.699$). Instead, plan-focused auditors remain focused on completing the six steps of the planned audit program regardless of whether they receive the abstract prompt (mean planned procedures = 5.04) or not (mean = 5.46, $\chi_1^2 = 0.47$, $p = 0.495$).

The fourth possibility we consider is that the abstract prompt was ineffective because it was not sufficient to *disrupt* auditors' focus on performing planned procedures. This explanation has support in our data. The plan-focused program appears to be an impediment to performance that, as previously discussed, caused many plan-focused auditors to carry out the audit program in a rote fashion, making disrupting their plan very difficult. In contrast, the goal-focused program was effective because it *removed* this impediment to performance. This suggests that while our abstract prompt manipulation was successful, it was not sufficient for improving plan-focused auditor performance. Further, there is no significant association between abstract thinking, as *measured* by our manipulation check, and the number of target procedures selected by plan-focused auditors ($r = 0.143$, $p = 0.303$), corroborating our conclusion that abstract thinking is simply not sufficient for disrupting a focus on performing planned procedures.²⁹ Thus, we conclude that even when thinking more abstractly, auditors who use plan-focused programs struggle to flexibly deviate from their plans in order to collect relevant, unplanned evidence because of the barriers to performance these programs can create.

V. DISCUSSION AND CONCLUSION

Our study addresses a problem with audit quality that has been difficult to solve because adding a new checklist or audit program step is not effective for ensuring collection of as yet unidentified, but necessary audit evidence (Griffith et al. 2015b). Instead, improving performance on these tasks requires auditors to flexibly respond to new information. Our study suggests that goal-focused programs are a promising innovation that can help improve performance when auditing accounts for which it is difficult to identify all relevant evidence in advance, such as estimates and higher fraud-risk accounts. In these settings, auditors must remain open to information about additional risks and respond to this information by collecting additional, relevant

²⁸ The analysis of time excludes data from 12 participants for whom total time exceeds 60 minutes and, thus, likely includes idle time. See footnote 27 for rationale. Truncating at 75, 90, or 120 minutes yields the same inferences.

²⁹ Similarly, this conclusion remains true if we drop the subset of participants who did not respond to the abstract prompt by describing broader audit quality goals, such as identifying material misstatements in the financial statements or ensuring financial statement users receive reliable information. Plan-focused auditors who respond to the abstract prompt as expected still do not select significantly more target procedures (mean = 0.94) than plan-focused auditors who do not receive the prompt (mean = 0.64, $Z = 1.01$, $p = 0.156$, one-tailed) and there is still no association between the level of abstract thinking and selecting more target procedures ($r = 0.068$, $p = 0.666$).

evidence. We investigate whether changing the focus of the audit program improves auditors' collection of critical, unanticipated evidence.

We find that compared to auditors who use plan-focused audit programs, auditors who use goal-focused audit programs are more attentive to cues that suggest that additional evidence is necessary and are more likely to respond to these cues by collecting relevant, unplanned evidence. Due to their superior information acquisition, goal-focused auditors also choose to bring more key, contradictory evidence to the attention of their manager. We follow up on concerns about auditors' use of step-by-step audit programs (Griffith et al. 2015b) and show that shifting the focus of audit programs to general task goals improves performance when necessary audit procedures cannot be identified when the audit program is designed. Since step-by-step programs are the standard of practice, our study can potentially help practitioners and regulators consider whether alternative methods are more appropriate for some areas of the audit.

Future research will be necessary to determine how goal-focused audit programs could be implemented in practice and the related costs and benefits associated with this. Importantly, we designed a powerful manipulation in order to test our theory about audit program focus and we would not expect audit programs in practice to look exactly like we have operationalized them in this study. Nevertheless, our informal conversations with practitioners reinforce our belief that audit programs in practice can be designed to be focused relatively more on performing specific, predefined procedures or attaining task goals. Further, we expect that implementing goal-focused programs on the entire audit likely is not desirable, since we hypothesize that using this type of program is beneficial only when unforeseen evidence may exist. We do not expect a benefit from goal-focused programs on tasks for which all of the steps to be performed can be specified in advance. Thus, audit firms might consider designing special, more goal-focused programs for use in areas such as estimates, where flexibility is critical.

We also identify a theory-driven mechanism to improve plan-focused auditor performance, but find no evidence that having auditors think abstractly about their task improves their collection of relevant, unplanned evidence. Our data suggest that we successfully manipulated abstract thinking. This produces an important theoretical insight. The failure of abstract thinking to improve performance, in combination with evidence that many plan-focused auditors completed their task in a rote fashion, suggests that the barriers to effective evidence collection contained in plan-focused audit programs are strong and difficult to overcome. Since plan-focused audit programs have benefits, such as improving the consistency of performance (McDaniel 1990), future research should continue to look for ways to mitigate the drawbacks of using plan-focused programs in settings where flexibility is important to audit effectiveness.

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APPENDIX A

Evidence Collection Screen

Note: Auditors’ audit programs were visible at the top of this screen. Auditors selected from the following procedures, examined the evidence revealed by the selected procedure, and repeated this process iteratively until they selected “I am finished.” We indicate below whether each procedure represents a planned procedure, a target procedure, or an irrelevant procedure. These labels were not available to auditors. On the first iteration of the evidence collection process, we randomized the order in which the 12 procedures were presented. We preserved this order for all future iterations. The order below represents one of many possible orders.

Review Hawthorne’s analysis of its growth rate compared to a peer set of firms. (Planned)	Perform a sensitivity analysis. (Planned)
Inquire with Production about its production schedule. (Target)	Corroborate the projections with someone outside of accounting. (Planned)
Perform a lookback analysis: compare historical revenue projections by product to actuals. (Planned)	Review the electronics industry outlook and macro-economic indicators. (Planned)
Review Hawthorne’s analysis of its allowance for doubtful accounts. (Irrelevant)	Tie out current projections by product to the DCF model. (Planned)
Review Hawthorne’s write-offs of accounts receivable for the year. (Irrelevant)	Perform a ratio analysis of accounts receivable. (Irrelevant)
Analyze the aging of accounts receivable. (Irrelevant)	Review analyst coverage of GOL Stores. (Target)
<i>Review my notes from the meeting with Hawthorne’s Chief Financial Officer, James Ward.</i>	<i>Go back to Hawthorne’s Step 1 and Discounted Cash Flow Analyses.</i>
<i>Review my notes form the planning discussion with my manager.</i>	<i>Go back to the Company Background and Audit Materiality.</i>
I am finished collecting evidence.	

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APPENDIX B³⁰

Audit Program Manipulation

Planning the Audit of Hawthorne’s Revenue Projections

The **goal** you are trying to achieve is to evaluate the reasonableness of Hawthorne’s revenue projections.

Prior to fieldwork, you discussed the **planned audit procedures** for the revenue projections with your manager. Based on this discussion, you plan to: (1) tie out current projections by product to the DCF model, (2) perform a lookback analysis: compare historical revenue projections by product to actuals, (3) corroborate the projections with someone outside of accounting, (4) perform a sensitivity analysis, (5) review the electronics industry outlook and macro-economic indicators, and (6) review Hawthorne’s analysis of its growth rate compared to a peer group of firms.

Your firm recommends that you create an audit program before beginning fieldwork.

Note: Auditors in the **goal-focused** condition received the instructions below. The software required auditors to drag the goal they are trying to achieve into the audit program; they were not able to include any other information in the program.

Further, when auditing fair value assumptions, the audit program should include the **goal** you are trying to achieve.

Please drag the goal you are trying to achieve into the audit program displayed below:

Items	Goodwill Audit Program: Revenue projections
My goal is to evaluate the reasonableness of Hawthorne’s revenue projections.	

Note: Instead of the above instructions, auditors in the **plan-focused** condition received the instructions below. The software required auditors in this condition to drag each of the six planned audit procedures into the audit program in the order they are listed; they were not able to include any other information in the program.

Further, when auditing fair value assumptions, the audit program should include each of the **planned audit procedures**.

Please drag in order each of the planned audit procedures into the audit program displayed below:

³⁰ Appendix B is available, in its original format, as a downloadable Word document. Please see the link in Appendix C.

Items

1. Tie out current projections by product to the DCF model.
2. Perform a lookback analysis: compare historical revenue projections by product to actuals.
3. Corroborate the projections with someone outside of accounting.
4. Perform a sensitivity analysis.
5. Review the electronics industry outlook and macro-economic indicators.
6. Review Hawthorne's analysis of its growth rate compared to a peer group of firms.

Goodwill Audit Program: Revenue projections

APPENDIX C

accr-52880_Appendix B: <http://dx.doi.org/10.2308/accr-52800.s01>