

THE EFFECTS OF USING PROCESS ACCOUNTABILITY AND OUTCOME
ACCOUNTABILITY ON SUSCEPTIBILITY TO DIRECTIONAL GOALS:
AN EXAMINATION OF MANAGEMENT'S MEMORY IN FINANCIAL REPORTING

BY

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ABSTRACT

Managers are often held accountable for either or both the decision outcome and the decision process, with implications for the influence of motivated reasoning in their judgments and decisions. I review these implications in the context of managers' memory for the *source* of information. Integrating psychology theory, I examine how the type of accountability (outcome or process) interacts with managers' situational preferences to influence management's accuracy and confidence in its memory for the source of information. In the experiment, participants assume the role of managers and review evidence—preference-consistent and preference-inconsistent—regarding a potential environmental liability provided by both a more reliable source and a less reliable source. Compared to process-accountable participants, outcome-accountable participants: 1) make less accurate source attributions, 2) report a greater difference in confidence between preference-consistent and preference-inconsistent source attributions, and 3) display lower confidence calibration for preference-consistent source attributions. When participants are held accountable for both decision process and decision outcome, they display lower source attribution accuracy and calibration compared to participants accountable only for the decision process. My dissertation contributes to our understanding of the relation between motivated reasoning and memory, and suggests accountability affects managers' objectivity in financial reporting.

Keywords: accountability, motivated reasoning, source attribution, confidence, financial reporting

To my family and friends

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CHAPTER 1: INTRODUCTION

Managers rely heavily on others as sources of information (e.g., Auster and Choo 1994; de Alwis et al. 2006; O'Reilly 1982), with the *source* of information itself being an indicator of the extent to which managers should rely on the information. Other things being equal, information from more reliable sources should be given greater weight in financial reporting judgments and decisions than information from less reliable sources (e.g., Birnbaum and Stegner 1979; McGinnies and Ward 1980; Pornpjtakpan 2004). Therefore, the manager's ability to correctly recall the source of remembered information (i.e., source attributions) can influence the overall quality of management judgment and decision making. I examine how the type of accountability (outcome or process) interacts with managers' situational preferences to influence their source attributions and confidence in source attributions.

Managers are often held accountable for either or both the decision outcome or decision process. Integrating accountability theory (e.g., Lerner and Tetlock 1999; Siegel-Jacobs and Yates 1996; Tetlock 1983) and motivated reasoning (e.g., Boiney et al. 1997; Kunda 1990) suggests that outcome accountability enhances managers' preferences, leading to biased reasoning in their judgment and decision making, while process accountability likely mitigates susceptibility to bias. Incorporating Johnson et al.'s (1993) source monitoring framework from psychology, my theory further suggests that managers' situational preferences are less likely to influence source attribution accuracy and confidence when managers are held accountable for the decision process rather than for the decision outcome. However, I also examine a boundary condition for these benefits, providing insights into the consequences of being held accountable for more than one type of accountability, as is often the case in naturalistic settings.

Investigating managers' memory is important because, like experts in other disciplines, managers rely on their memories in the performance of their daily activities (e.g., Birnberg and Shields 1984; Heitger 2007; Libby and Trotman 1993; Moeckel and Plumlee 1989). For example, I anticipate managers rely on their memories to some extent in determining applicable financial reporting requirements and when they are triggered, such as with reporting or adjustment of a deferred tax asset valuation allowance. In determining this allowance, managers consider various factors (e.g., sales contracts, asset fair values, loss carryforwards, expected future earnings, private information, etc.) over long periods of time (Kumar and Visvanathan 2003; Miller and Skinner 1998; SFAS 109). This requires memory for this information as well as the sources of information. Further, managers need to not only consider information individually, but also consider any patterns in that information. Baron (2006) indicates entrepreneurs identify business opportunities by using their cognitive frameworks, developed through experience, to identify patterns in their changing environment. Similarly, I anticipate managers use their cognitive frameworks, developed through their business, industry, and company experience, to identify patterns relevant to financial reporting. Such pattern recognition and interpretation requires use of memory.

Memory errors can influence the overall quality of management judgment and decision making. For example, managers who rely on their memory for historical activity data anchor on their incorrect initial beliefs of how activities impact costs (Heitger 2007), lowering activity cost estimation accuracy. Memory for the source of information in particular plays an important role as accurate source attributions generally lead to more accurate beliefs and actions (e.g., Gordon et al. 2005; Johnson et al. 1993). For example, Hodge (2001) demonstrates that, due to information integration, investors inaccurately attribute a hyperlinked unaudited optimistic

voluntary disclosure to previously reviewed audited financial statements, resulting in inflated assessments of disclosure credibility and the company's earnings potential.

I report an experiment in a financial reporting and decision making setting to test my theory, examining a management going concern assessment. This setting is motivated by the Financial Accounting Standards Board's (FASB) issuance (October 2008) of a proposed accounting standard (*Going Concern*) to formalize management's responsibility to assess the ability of its company to continue as a going concern.¹ I use a 3 x 2 x 2 mixed design, with one between-participants variable and two within-participants variables. The independent variable manipulated between-participants is *accountability*. The independent variables manipulated within-subjects are *evidence consistency with preferences* (hereafter, *evidence type*) and *source reliability*. Participants complete a source recognition task, provide confidence ratings, make a going concern judgment, and assess source reliability.

The experiment results partially support my predictions about source attribution accuracy and confidence. First, I predict and find that participants accountable only for the decision process make more accurate source attributions than do participants accountable only for the decision outcome. I find that this reduction in accuracy is, at least in part, because of a significantly stronger tendency to incorrectly attribute preference-consistent information to the more reliable source and a significantly stronger tendency to incorrectly attribute preference-inconsistent information to the less reliable source or as new. Second, regarding confidence in source attributions, I predict and find that participants report a greater difference in confidence between preference-consistent and preference-inconsistent source attributions when participants are held accountable only for the decision outcome. Similar to the accuracy results, I find a

¹As of the FASB's last project update of January 20, 2011, the proposed standard was renamed *Disclosures about Risks and Uncertainties and the Liquidation Basis of Accounting* to reflect the broadened scope of this project.

significant difference in confidence calibration for preference-consistent source attributions (but not for preference-inconsistent source attributions) between participants accountable only for the decision outcome and those accountable only for the decision process.

Finally, my research questions examine the potential limitations of participants being held accountable for the decision process as well as the decision outcome. I find that the accuracy and calibration improvements observed under decision process accountability are mitigated by the addition of outcome accountability, with the accuracy and calibration of participants held accountable for both outcome and process approximating that of participants held accountable for only decision outcome.

Although my examination of the hypotheses and research questions demonstrate improvements for source attribution accuracy and confidence for participants accountable only for the decision process, consistent with theory, it is not clear whether these benefits are because process accountability is present or outcome accountability is absent. I report two sets of supplemental analyses to address this issue, namely comparisons to the control (not accountable) condition and power analyses. Results from the supplemental analyses are more suggestive of the absence of outcome accountability rather than the presence of process accountability leading to my observed findings.² These results suggest that a downside of outcome accountability is that it can enhance directional goals, leading to greater motivated reasoning in judgments and decisions.³ Related implications should be considered when companies determine the type of accountability to implement, including in the design of their management incentive schemes.

² As discussed below, there is a particularly strong preference and goal commitment in a going concern setting. This may have contributed to the inability to distinguish the process only condition from the control condition. In my discussion of future research, I note how the use of a different setting with a preference and goal commitment not as strong as that in a going concern setting will help address this possibility.

³ Given the similarity of the process only accountability condition and control condition, the results also suggest that the increased effort with process accountability does not also increase bias in that effort.

There are two potential concerns with the going concern setting used in my dissertation experiment: 1) the significance of the role of memory and 2) the potential overwhelming effect of a particularly strong preference and goal commitment. To address these concerns, I plan to conduct a follow-up study, involving a similar environmental liability issue but without any going concern implications. This follow-up study is described in more detail in my discussion of future research.

My hypotheses and research questions are stated in terms of source attributions and are examined in a related lab setting. However, I do not see any reason why my theory would not generalize to other aspects of memory or justification behavior in general (e.g., pattern recognition, mental models, or information interpretation) and to other judgment and decision making settings (e.g., managerial accounting or audit), given four key setting factors are present—use of memory, the potential for both outcome and process accountability, a general preference, and a task where information is gathered from various sources. Examples of potential generalizations are described further in my discussion of future research.

This dissertation makes two theoretical contributions. First, I contribute to our understanding of accountability by examining the impact of the type of accountability (outcome or process) on the influence of directional goals on source attribution accuracy and confidence in source attributions. Doing so adds to our understanding of the relation between motivated reasoning and memory, extending prior accounting and psychology research (e.g., Boiney et al. 1997; Moeckel and Plumlee's 1989). This also extends psychology research (e.g., Gordon et al. 2005) by demonstrating a feature common to the accounting judgment and decision making setting (i.e., accountability) impacts source attribution errors. That is, with outcome

accountability promoting further commitment to the directional goal, I examine the potential for process accountability to act as a debiasing mechanism.

Second, I extend the application of motivation reasoning theory by examining another mechanism through which motivated reasoning may affect memory—accuracy (rather than type) of information recalled. Prior accountability research in accounting generally does not examine memory (e.g., Buchman et al. 1996, DeZoort et al. 2006, Perkins 2003, and Turner 2001). Those studies that do generally examine only the bias in the type of information recalled (e.g., expectation and preference consistency—Tan 1995; preference consistency—Wilks 2002) and not errors in the accuracy of what is recalled. Exceptions are Ricchiute (1997 and 1999), finding that auditors are more likely to correctly recognize information that was present and incorrectly recognize information that was not present given information consistency with their prior judgments. I extend this research by also examining how preference consistency affects the pattern of source attributions. In addition, Thayer (2011) finds that investors—who are aware of whether analysts' reports will be consistent or not with their preferences—conduct a biased information search of those reports to confirm their preferences. I extend Thayer (2011) by examining the impact of motivated reasoning on source attributions and confidence when managers have reviewed both preference-consistent and preference-inconsistent information. I also extend that research by examining the potential for accountability to reinforce or mitigate the influence of motivated reasoning.

Finally, the results of my dissertation research should have practical implications for financial reporting. Specifically, I demonstrate that the type of accountability affects the objectivity of management's evidence evaluation for financial reporting judgment and decision making. Therefore, my results suggest that financial statement users will likely have more

accurate financial information on which to base their resource allocation decisions when managers are accountable for the decision process rather than the decision outcome. Results also suggest potential benefits from further investigating the impact of emphasizing process over outcome when more than one type of accountability is present in the naturalistic decision setting.

The remainder of this dissertation proceeds as follows. Chapter 2 develops the hypotheses. Chapter 3 describes the experimental method and Chapter 4 reports the results. Chapter 5 discusses limitations and future research goals. Chapter 6 summarizes and concludes.

CHAPTER 2: BACKGROUND AND HYPOTHESIS DEVELOPMENT

In this chapter, I first define accountability and review potential situations in which accountability can vary for company management. By doing so, I demonstrate the relevance of accountability to management judgment and decision making. I then provide background on key theories for my dissertation—motivated reasoning, source monitoring, and accountability. Integrating these theories as a basis for my predictions, I next develop my hypotheses for how decision outcome accountability and decision process accountability will interact with directional goals to influence source attribution accuracy and confidence. Finally, I discuss a potential boundary condition of being held accountable for both decision outcome and decision process, which I examine in my research questions.

2.1 ACCOUNTABILITY AND MANAGERS

Accountability refers to the expectation that one may need to justify one's views to others, with much research suggesting that it can influence the use of cognitively demanding strategies as well as the focus of the cognitive strategies employed by decision makers across a variety of settings (e.g., Lerner and Tetlock 1999; Tetlock 1985). Company managers make many financial judgments and decisions, and are likely held accountable for various aspects of their judgments, including both the resulting outcome (e.g., accuracy of an estimated liability) as well as the judgment process applied (e.g., adequacy of procedures used to estimate the liability).

For example, the extent to which managers are held accountable for their decision outcome versus their decision process may depend on the inside versus outside director composition of a company's board of directors. Generally, inside directors have a superior amount and quality of firm information than outside directors (Baysinger and Hoskisson 1990, Shepardson 2011). Given this, a board dominated by outside directors may emphasize outcome

accountability in review and evaluation of its management as ex post financial outcomes (e.g., stock price or budget targets) are easier to implement and verify. A board with more inside directors may emphasize ex ante process accountability in review and evaluation because these directors have superior information, including direct observations of management's decision making process (Baysinger and Hoskisson 1990).⁴ In addition, the extent to which managers are held accountable for their decision outcome versus their decision process by auditors may vary. The continued emphasis on improving auditors' judgment process (e.g., KPMG 2011) suggests that in some areas (e.g., fair value estimation) auditors will emphasize understanding management's decision process. However, this may also depend on the audit firm, as the extent to which auditors examine details and management's assumptions vary (Rafferty 2009).

Thus, it is also possible that managers' accountability will vary by individual accounting item. For example, I conjecture that the implementation of fair value accounting lends itself to such natural variation. If the fair value of an accounting item (e.g., a Level 1 financial instrument) is well-defined because there is an actively traded market, then outcome accountability may be emphasized. However, if an accounting item (e.g., a Level 3 financial instrument) does not have a ready market, fair value assessments would likely be based on earnings and cash flow projections or professional appraisals. In such situations, process accountability may be emphasized.

Prior research in both psychology (e.g., Siegel-Jacobs and Yates 1996; Simonson and Staw 1992) and accounting (e.g., DeZoort et al. 2006; Perkins 2003; Turner 2001) has tended to

⁴ The comparison of outside versus inside director is generally stated. I acknowledge that outside director's information disadvantage may be mitigated, for example, if these directors manage companies in similar industries or regulatory/competitive environments, are former company executives, only serve on one board, or are able to gain insights from inside directors. Therefore, the intent is not to indicate that a focus on outcome accountability will always occur if a board is primarily composed of independent directors, but only that this could occur under some circumstances. This is similarly true for the generalization for inside directors.

theorize and examine the effects of outcome accountability separately from process accountability. Therefore, in examining the influence of accountability on management's financial judgments and decisions, I consider how outcome accountability and process accountability are each expected to impact the influence of management's directional goals, before expanding to the interactive effects between these two types of accountability. In doing so, I first draw on motivated reasoning and source monitoring theories, and suggest how their interaction is likely influenced by accountability to predict effects on source attributions and confidence in source attributions.

2.2 MOTIVATED REASONING, SOURCE MONITORING, AND ACCOUNTABILITY

Motivated reasoning theory describes how directional goals influence the methods people apply in accessing, constructing, and evaluating their beliefs (Kunda 1990). That is, people use strategies that will most likely lead to a particular conclusion, within a reasonableness constraint necessary to maintain an illusion of objectivity. Consistent with motivated reasoning, prior research in psychology demonstrates that decision makers bias their managerial judgments as needed to support a desired outcome (Boiney et al. 1997). Also, prior research in accounting demonstrates that preferred outcomes can influence investors' judgments (e.g., Hales 2007; Thayer 2011) and that client and audit firm preferences can influence auditors' judgments (e.g., Hackenbrack and Nelson 1996; Peecher 1996; Wilks 2002).

Gordon et al. (2005) demonstrate that preferences also influence source attributions. They examine the source monitoring framework, which is a theoretical framework from psychology for understanding how people identify (i.e., attribute) the source of their memories, knowledge, and beliefs (Johnson et al. 1993). Gordon et al. find that wishful thinking affects

source attributions, with undergraduate students more likely to attribute desirable predictions to a more reliable source and undesirable predictions to a less reliable source.

Returning to a financial reporting setting, managers often have situation specific financial reporting preferences and directional goals. For example, in many circumstances, managers have directional preferences about net income (e.g., increase to meet analyst forecasts) or liquidity (e.g., increase to meet debt covenants).⁵ However, whether results similar to Gordon et al.'s (2005) would occur in such financial reporting settings is an open empirical question. On the one hand, results may not be similar because Gordon et al. use a minimally involving task for which participants have no reason to believe their judgments would have any personal consequences. Therefore, participants may not have exerted significant cognitive effort and, thus, were perhaps more likely to use wishful thinking as a cue for source judgments. Financial reporting judgment and decision making is relatively more effortful, with the review and integration of related pieces of information in order to make an overall decision. On the other hand, results may be similar to Gordon et al.'s because accounting research has shown that motivated reasoning influences even professional participants' judgments and decisions (e.g., Hackenbrack and Nelson 1996; Peecher 1996; Wilks 2002). These studies, however, demonstrate this influence through mechanisms such as aggressive interpretation of accounting standards and biased evidence search, weighting, and evaluation. Therefore, whether motivated reasoning will influence managers' source attribution is uncertain when other mechanisms are available to achieve directional goals.

⁵ In other circumstances, managers may have different directional preferences about net income (e.g., decrease to create "cookie jar reserves") or liquidity (e.g., decrease when facing labor renegotiations). This research focuses on the impact of a main or overriding directional preference on source attributions, but future research could examine issues of how motivated reasoning affects source attributions under conflicting directional preferences.

Further, accountability is another factor expected to influence whether results similar to Gordon et al.'s (2005) will occur in an applied accounting setting. Gordon et al. do not consider accountability which is often present in a management judgment and decision making setting. In a typical financial reporting task, participants could easily perceive how either the outcome or the process used to complete such a task would have significant consequences for the manager.

2.3 EFFECTS OF ACCOUNTABILITY ON SOURCE ATTRIBUTIONS AND ACCURACY

The focus of outcome accountability and process accountability differs. With outcome accountability, the focus is on the result of the decision and its subsequent accuracy or effectiveness, rather than on how the decision is determined. Holding decision makers accountable for a decision outcome provides an incentive for them to produce a response which will be positively evaluated (Siegel-Jacobs and Yates 1996), and increases the escalation of commitment to a decision along with the need for self-justification and defense of that decision (e.g., Lerner and Tetlock 1999; McNamara et al. 2002). With process accountability, the focus is on the quality of the process that a decision maker uses in arriving at a response, rather than on the decision outcome (Siegel-Jacobs and Yates 1996). When held accountable for the decision process, decision makers are motivated to exert greater cognitive effort in a more careful and balanced way (Lerner and Tetlock 1999), which leads to better encoding of information and facilitates its accurate retrieval and recall (Tetlock 1983). Therefore, process accountability tends to mitigate judgment biases (e.g., recency—Kennedy 1993; common error bias—Libby et al. 2004), improve consensus and self-insight (Johnson and Kaplan 1991), increase evidence

review (Turner 2001), and mitigate escalation of commitment (McNamara et al. 2002) relative to no accountability or being informed about accountability only after evidence review.⁶

If source attributions are biased due to motivated reasoning, this prior research suggests that outcome accountability will reinforce and process accountability will mitigate the influence of managers' situational preferences on source attributions. As a result, I expect process-accountable managers to have higher source attribution accuracy than outcome-accountable managers. I therefore test the following hypothesis regarding source attributions:

H1: When managers are accountable only for the decision process, their source attributions are more accurate compared to those of managers accountable only for the decision outcome.

The overall source attribution accuracy difference between outcome accountability and process accountability is, at least in part, a natural consequence of the extent of bias underlying source attributions. That is, the greater the tendency to misremember source attributions to be consistent with preferences, the lower will be source attribution accuracy. Therefore, also based on the above reasoning, I predict that outcome-accountable managers will misremember source attributions to be consistent with their preferences to a greater extent than will process-accountable managers. Thus, I examine the following additional hypotheses regarding source attributions:⁷

⁶ Limited research has found process accountability may not always improve decision making. For example, Conlon and Wolf (1980) suggest that high decision visibility (i.e., decision maker's felt need to justify decision to others) emphasizes the decision maker's dominant project allocation strategy. Therefore, decision visibility can improve decision making if the dominant strategy is precision or hinder decision making if the dominant strategy is escalation. Thus, to the extent to which my participants' dominant strategy is to achieve a positive going concern assessment, process accountability may reinforce this dominant strategy and bias against finding support for my predictions.

⁷ Other attribution patterns would include outcome-accountable managers having 1) a reduced tendency to incorrectly attribute preference-consistent information to a less reliable source and 2) a reduced tendency to incorrectly attribute preference-inconsistent information to a more reliable source. Because these types of errors are preference-inconsistent, outcome-accountable managers have an incentive to avoid such errors—that is, to be

H2a: Managers accountable only for the decision outcome will have a greater tendency to incorrectly attribute preference-consistent information to a more reliable source compared to managers accountable only for the decision process.

H2b: Managers accountable only for the decision outcome will have a greater tendency to incorrectly attribute preference-inconsistent information to a less reliable source or as new compared to managers accountable only for the decision process.

2.4 EFFECTS OF ACCOUNTABILITY ON SOURCE ATTRIBUTION CONFIDENCE

The impact of source attribution bias may be limited if managers recognize its potential and adjust their confidence in their judgments accordingly. However, prior psychology research suggests that confidence assessments are biased to rationalize judgments and decisions. For example, individuals bias their assessed confidence in their choice in order to justify their selection (Koriat et al. 1980). Also decision makers motivated to reach a particular conclusion demonstrate confidence bolstering by increasing their confidence in their biased judgments, and are at least as confident as non-motivated decision makers in their biased estimates (Boiney et al. 1997).

However, accountability for the decision process has been found to improve confidence calibration in non-memory contexts. For example, when individuals expect to explain why and how they use information or the type of information used to make their judgments, their calibration improves compared to nonaccountable participants and participants accountable only for the decision outcome (e.g., Siegel-Jacobs and Yates 1996; Tetlock and Kim 1987). This may be due to increased integrative complexity in information processing, consistent with Koriat et

accurate for these cases. Thus, in these cases, outcome-accountable managers and process-accountable managers both have an accuracy goal. Because the focus of my research is to contrast outcome accountability and process accountability and I do not have a theoretical basis for predictions when these two types of accountabilities lead to similar goals, I do not examine these types of attributions.

al.'s (1980) suggestion that overconfidence errors occur when individuals focus on choice-consistent information, rather than contradictory information. This is also consistent with Siegel-Jacobs and Yates' (1996) suggestion that individuals exhibit better calibration when they give more thought to the usefulness of available information as this increases sensitivity to the level of uncertainty present for each judgment.

This prior research suggests that outcome accountability and process accountability will differentially affect the influence of managers' situational preferences on confidence in memory. Specifically, I predict outcome accountability will promote confidence assessments in source attributions consistent with preferences—i.e., greater confidence in preference-consistent source attributions relative to preference-inconsistent source attributions. However, process accountability will mitigate this difference. I therefore examine the following hypothesis regarding memory confidence:

H3: Managers accountable only for the decision outcome have greater relative confidence in their preference-consistent source attributions than in their preference-inconsistent source attributions compared to managers accountable only for the decision process.

Based on this prior research, I also predict process accountability will improve confidence calibration for source memories compared to outcome accountability. Thus, I examine the following additional hypothesis regarding memory confidence:

H4: When managers are accountable only for the decision process, their confidence in source attributions is better calibrated compared to that of managers accountable only for the decision outcome.

2.5 BOUNDARY CONDITION: EFFECTS OF ACCOUNTABILITY FOR BOTH DECISION OUTCOME AND DECISION PROCESS

The effect of decision makers being held accountable for both their decision outcome and their decision process is unclear. Although research in accounting (e.g., DeZoort et al. 2006; Perkins 2003; Turner 2001) and psychology (e.g., Siegel-Jacobs and Yates 1996; Simonson and Staw 1992) examine, directly or indirectly, both outcome accountability and process accountability, these studies generally do not examine the two types of accountability in combination. An exception is Brtek and Motowidlo (2002), a psychology study that compares the effects of outcome accountability and process accountability on the validity of interview judgments. The authors hypothesize and find two significant main effects, but do not discuss or find an interaction.

Nevertheless, prior psychology research provides reason to believe that there are circumstances where an interaction will occur. Specifically, Lundgren and Prislin (1998) find that when an accuracy motivation is added to a defensive (directional) motivation, biased processing is preserved. Parallel reasoning likely applies to process accountability (which provides an accuracy motivation) and outcome accountability (which provides a directional motivation). Adding process accountability to outcome accountability may limit the benefits of process accountability such that biased processing continues.

McNamara et al.'s (2002) archival study may also provide some insights. McNamara et al. (2002) suggest that loan officers maintain an undesirable decision commitment because acknowledging a bad decision outcome (deterioration of a borrower's credit risk) triggers increased monitoring of the borrower. Increased monitoring of the borrower may imply increased monitoring of the loan officer's decision process. Although McNamara et al.'s focus is on outcome accountability potentially triggering process accountability, their study supports that

decision makers may still focus on outcome accountability despite process accountability also being present.

While this prior research is suggestive (McNamara et al. 2002) and exploratory (Lundgren and Prislin 1998), it also does not examine confidence. Thus, I examine the following research questions regarding source attributions and confidence:

RQ1: When managers are accountable for both outcome and process, does the accuracy of their source attributions approximate that of either managers accountable only for the decision process or managers accountable only for the decision outcome?

RQ2: When managers are accountable for both outcome and process, is their confidence in source attributions similarly calibrated as that of either managers accountable only for the decision process or managers accountable only for the decision outcome?

In the next chapter, I describe the experimental methods used to examine my hypotheses and research questions.

CHAPTER 3: RESEARCH METHOD

In this chapter, I first discuss my participants and their appropriateness for this study and compensation. I then describe my setting, including key features that make it appropriate for examining my hypotheses and research questions. Finally, I describe my experimental method, including the 3 x 2 x 2 mixed design, dependent measures, and experimental procedures.

3.1 PARTICIPANTS

Participants are 78 undergraduate students recruited from a senior-level auditing course at a large public university. The use of undergraduate business student participants in this study (as well as master's level business student participants in a planned follow-up experiment) is appropriate as my dissertation concerns the evaluation of my theory. I do not anticipate that any factor that differentiates students and managers will interact with the elements of the theory investigated or in such a way that it would threaten my ability to attribute the change in dependent variables to the manipulated independent variables (key considerations in determining the appropriateness of participants—Peecher and Solomon 2001). For example, despite managers' experience, I anticipate they have directional goals and are subject to motivated reasoning as demonstrated with other professionals (e.g., auditors—Wilks 2002). This is also consistent with findings that more experienced MBA and manager participants are subject to other decision making biases (e.g., winner's curse—Dyer et al. 1989; outcome effect—Tan and Lipe 1997).⁸ Further, my dissertation is intended to increase understanding of underlying factors that may influence the determination of a technical judgment (e.g., going concern assessment);

⁸ Another factor that supports the generalizability of an experiment's findings is whether *experimental realism* is achieved, i.e., did participants perceive the experiment as realistic (e.g., Dobbins et al. 1988). Although participants provided limited comments regarding the experiment in general, several comments indicated participants viewed the experiment as realistic and interesting.

however, the technical judgment itself is not the focus of my dissertation. I anticipate this increased understanding will generalize to managers.

Three additional reasons also support the use of student participants in my dissertation research. First, these students are likely training to become managers or for positions in which they will interact with managers. Therefore, they should have a sufficient understanding of the general financial reporting issues managers face and their consequences, and should be aware of managers' related preferences and incentives. In addition, both undergraduate business students (e.g., Coletti et al. 2005; Hannan et al. 2006) and MBAs' (e.g., Libby et al. 2004) judgments and decisions have been used in prior accounting research to proxy for managers' judgments and decisions. Second, a test of my theory requires that participants understand a manager's preference for a positive going concern assessment. The description in the case materials and a subsequent reinforcement task will enhance or develop all participants understanding of this particular preference. Developing such an understanding is consistent with Libby et al.'s (2002) indication that researchers can train student subjects to possess an attribute of interest. Finally, my study examines accountability and its influence on information processing. Student participants have been used in accountability research in both psychology (e.g., Siegel-Jacobs and Yates 1996; Tetlock and Kim 1987) and accounting (e.g., Kennedy 1993; Libby et al. 2004). Student participants are appropriate in studies that focus on general cognitive abilities (Libby et al. 2002).

Participants completed the study for extra course credit, and also had the opportunity to receive one of six \$10 gift certificate prizes. Participants attended one of ten experimental sessions. Generally between-participants conditions were held in separate sessions, except for two sessions where participants were randomly assigned to the two or three (respectively)

between-participants conditions administered. When more than one between-participants condition was held during the same session, participants were separated by condition either in different rooms and/or different sections of the same room.

3.2 SETTING

Addressing my hypotheses and research questions requires a setting that involves four key features: 1) use of memory, 2) the potential for both outcome and process accountability, 3) a general preference, and 4) a task where information is gathered from various sources. One such setting is management's going concern assessment. First, similar to an auditor's going concern assessment which involves memory (e.g., Rau and Moser 1999; Ricchiute 1997; Ricchiute 1999), management's going concern assessment will also likely involve memory.⁹ Second, given the requirement to make a formal assessment and the general process described, the proposed going concern standard emphasizes management is accountable for its decision process. Also, management is accountable for the decision outcome because of the potential consequences due to important stakeholders' reactions to the going concern decision itself and its subsequent accuracy.¹⁰ Third, management has a general preference for a positive going concern assessment (i.e., to find that its company is viable), with several factors contributing to this directional goal. For example, a positive assessment is preferred by important constituents such as stockholders (e.g., Geiger and Rama 2003; Venuti 2004). Conversely, a negative assessment may have a detrimental impact on the manager's reputation and on the company's operations

⁹ As previously noted, the selection of this setting is motivated by the FASB proposed standard. However, there is a potential concern that memory will play less of a role in a management going concern assessment because this is expected to be a well-documented process in the post-SOX environment. Therefore, there are other more routine financial reporting decisions where managers are more likely to rely on memory (and other key features are present) that may be better-suited for my investigation. In my chapter on future research, I describe one way of addressing this concern with a planned follow-up study in a setting without going concern implications.

¹⁰ Ultimately, the relative degree to which the standard holds management accountable for its decision outcome versus its decision process in its going concern assessment is an empirical question influenced by various factors.

including, for example, an inability to obtain funds or an increase in cost of capital given lower creditor confidence, possibly leading to a self-fulfilling prophecy (Geiger and Rama 2003; Venuti 2004).¹¹ Fourth, managers will likely gather information from various sources in making their going concern assessments.

In the experiment, participants assume the role of a company manager (i.e., chief financial officer) responsible for making a management going concern assessment for his/her company. The going concern evidence items describe one issue, a potential environmental liability related to underground storage tanks located on the company's property. Specifically, the case describes how the company recently became aware of the existence of the underground storage tanks, and in order to estimate its potential environmental liability, the company obtains information from two sources (an outside environmental engineer and the company plant engineer). The sources provide information regarding the nature and extent of any hazardous substances present, potential risks, and costs for clean-up and other remedial actions.¹² The materials explain that the resolution of this issue will have a significant impact on the company's ability to remain viable.¹³

¹¹ There is a concern that this preference may be particularly strong as the going concern assessment also determines the basis of accounting applied to the financial statements. Therefore, process accountability may not have an effect. This concern and its possible mitigation will be addressed in a planned follow-up study described in my chapter on future research.

¹² Prior research (e.g., Ricchiute 1997; Weidman et al. 2010) and environmental liabilities guidance (e.g., SOP 96-1; USEPA 1996) aided in development of evidence items and other aspects of the experimental materials (e.g., Goodwin 1999; Gordon et al. 2005; Peecher 1996; Reimers and Fennema 1999; Ricchiute 1999; Wilks 2002). However, significant original development of materials was necessary given the setting, nature of the hypotheses, how they are examined, and the focus on management's judgments and decisions. For validation, the experimental materials were reviewed by a former auditor familiar with both going concern assessments and environmental remediation issues to ensure the reasonableness and clarity of the materials, that all evidence items are relevant to the main going concern issue, and that source reliability descriptions convey what is intended. In addition, the experimental materials were reviewed by two Department of Civil and Environmental Engineering (CEE) faculty members and a CEE graduate student familiar with environmental remediation issues to ensure that all evidence items are realistic and clearly explained.

¹³ Environmental issues may be resolved over a long time period. In order for the environmental issue presented in this experiment to be relevant for the current going concern assessment, participants are informed that all major items have been identified and that any remaining uncertainties will be resolved in the next 4-8 months.

3.3 METHOD

3.3.1 DESIGN

The experiment is a 3 x 2 x 2 mixed design. The independent variable manipulated between-participants at three levels is *accountability*.¹⁴ First, participants assigned to the *decision outcome only* accountability condition are informed that a score will be computed based on how closely their assessed likelihood that a company will continue to operate in the future approximates that of experienced professionals assuming a similar role as participants. Participants are also informed that they may be selected for a follow-up conference with a faculty member (who assumes the role of a member of the company's board of directors) to receive feedback about how their assessed likelihood compares to that of the experienced professionals. (The faculty member assumes this same role in the next two conditions as well.) In addition, participants are informed that \$10 gift certificate prizes will be awarded to top scorers. Finally, participants are asked to provide their names and contact information so that they could be contacted if necessary. (Contact information is also requested in the next two conditions.)

Second, participants assigned to the *decision process only* accountability condition are informed that a score will be computed based on how closely the reasoning behind their likelihood judgment approximates that of the experienced professionals. Participants are also informed that they may be selected for a follow-up conference with a faculty member to explain the reasoning behind their likelihood judgment. In addition, participants are informed that \$10 gift certificate prizes will be awarded to top scorers.

¹⁴ These manipulations were adapted from those used in prior accountability research in accounting (e.g., Kennedy 1993; Libby et al. 2004; Tan 1995) and psychology (e.g., Siegel-Jacobs and Yates 1996; Tetlock and Kim 1987).

Third, participants assigned to the *both decision outcome and decision process* accountability condition are informed that two scores will be computed 1) based on how closely their assessed likelihood approximates that of the experienced professionals and 2) based on how closely the reasoning behind their likelihood judgment approximates that of the experienced professionals. Participants are also informed that they may be selected for a follow-up conference with a faculty member to receive feedback about how their assessed likelihood compares to that of the experienced professionals and to explain the reasoning behind their likelihood judgment. In addition, participants are informed that \$10 gift certificate prizes will be awarded to top combined scorers.^{15 16}

The independent variables manipulated within-participants at two levels are *evidence type* and *source reliability*. For evidence type, all participants review two types of individual evidence items (one-half each): 1) positive going concern implication (preference-consistent) and 2) negative going concern implication (preference-inconsistent) (see Appendix A).¹⁷ For source reliability, all participants receive the names and source reliability descriptions for two sources: 1) more reliable source and 2) less reliable source (see Appendix B). Half of each of

¹⁵ The *decision process only* accountability condition seems less consistent with anticipated practice than is the *both decision outcome and decision process* accountability condition. That is, if management is held accountable for the decision process, they would likely also be held accountable for the decision outcome. However, holding participants accountable only for one type of accountability is more consistent with prior research in both accounting and psychology which does not explicitly manipulate accountability for the decision outcome along with accountability for the decision process (e.g., Johnson and Kaplan 1991; Kennedy 1993; Libby et al. 2004). In addition, although the *both decision outcome and decision process* accountability condition is more consistent with anticipated practice, it may bias against finding results for decision process accountability if participants focus on their accountability for the decision outcome. Given the advantages and disadvantages of each condition, both are included in the experiment. However, the *both decision outcome and decision process* accountability condition is used only to examine the research questions.

¹⁶ I also collected responses from participants who did not receive information about being held accountable. The significance of the results and related inferences of the planned contrasts used to examine the hypotheses and research questions remain unchanged if these responses are included as a between-participants condition in the ANOVAs. To simplify exposition, these responses will not be discussed further, except related to the supplemental analyses.

¹⁷ I also collected responses from participants for neutral going concern implication evidence items (i.e., inducing no preference as no going concern impact). The neutral evidence items are primarily used to provide a more realistic memory task by increasing the number of evidence items participants considered. These items are not used to examine the formal hypotheses and research questions, and will not be discussed further.

the two types of evidence items is provided by each source. There are eight versions of the case to vary which source is described first, which source provides which set of positive and negative evidence items, and which subset of evidence items (two of each evidence type) is presented as part of the original evidence or only on the source recognition test. However, the evidence items are the same across all three accountability conditions, and are randomized in the same way within each of the three accountability conditions.

3.3.2 DEPENDENT MEASURES

The main dependent measures focus on 1) source attributions and 2) confidence assessments. For the first main dependent measure, participants complete a source recognition test.¹⁸ Specifically, for each evidence item, participants indicate if the item was provided by either of the two potential sources or is new (i.e., check one of these options). Source attributions are used to determine source attribution accuracy—the overall proportion of the original evidence items attributed to the correct source. Source attributions are also used to determine two score measures—the number of preference-consistent evidence items incorrectly attributed to the more reliable source and the number of preference-inconsistent evidence items incorrectly attributed to the less reliable source or as new. For the second main dependent measure, participants indicate their confidence in each of their recognition task responses. Specifically, participants indicate their confidence in their response to each item on a 9-point

¹⁸ Given this proposal's focus is on managers' memory accuracy, selection of a recognition task, rather than a recall task, is consistent with prior accounting research examining memory accuracy (e.g., Lindberg and Maletta 2003; Moeckel and Plumlee 1989; Sprinkle and Tubbs 1998; Ricchiute 1999). In contrast, recall tasks are more commonly used in accounting research when the focus is on the type of memory information or memory organization (e.g., Choo and Trotman 1991; Tan 1995; Rau and Moser 1999). In addition, compared to recall, recognition 1) probes memory contents most directly without confounding by retrieval strategies, 2) allows the straightforward measurement of memory confidence, and 3) is less likely to produce an effect in tasks related to text and therefore provides a stronger test (as discussed in Moeckel and Plumlee 1989, Johnson 1994, and Ricchiute 1999, respectively).

scale ranging from 1 (completely uncertain) to 9 (completely certain). Dependent measures are examined overall, by preference consistency, and/or by accuracy.

3.3.3 PROCEDURES

The experiment is administered using three envelopes. There are two phases, separated by a distracter task intended to take no less than 5 minutes. See Appendix C for the experimental materials.

During Phase I, in envelope A, participants first read case instructions. Participants are also informed that they will later be asked to make additional judgments based on the information reviewed (i.e., during Phase II). Second, participants receive the accountability manipulation appropriate for their experimental condition. Third, participants read a brief description of the company and its founder and background information regarding their role as company managers responsible for making a going concern assessment. Participants also read background information regarding the potential environmental liability. Fourth, participants are informed of and reasons for the manager's general preference for the going concern assessment to enhance their understanding of this preference. Participants perform a preference reinforcement task in which they are asked to list three reasons why they would have the preference (e.g., similar to Wilks 2002). The first reason should be the most significant of those presented in the case, and the remaining reasons can be a reiteration of what is described in the case and/or their additional reasons. In addition, participants assess the strength of their preference. Fifth, participants who are held accountable again receive the accountability manipulation appropriate for their experimental condition, summarized consistent with their role as company managers. Sixth, participants review the two source descriptions which are counter-balanced. In addition, to enhance their understanding of differences in source reliability,

participants answer two questions to assess the relative education and experience of the two sources. Finally, participants review the evidence items provided by the two sources, and receive a brief reminder of the accountability manipulation appropriate for their condition. Once these tasks are completed, participants return the materials to envelope A before proceeding. (Also, envelope A is collected during the experiment.) Participants then begin Phase II.

During Phase II, in envelope B, participants first complete a distracter task (i.e., a maze) to clear their short-term memory. Second, participants receive a brief reminder of their role as a company manager and their responsibility to make a going concern assessment. Participants are also reminded that they reviewed evidence relevant to the going concern assessment which was provided by two sources. The descriptions of the two sources are repeated. Third, participants complete a source recognition test based on evidence items contained in the information reviewed in Phase I, and also indicate their confidence in the response to each item (related dependent measures noted above). The source recognition questions are provided in one random order. Once this task is completed, participants return the materials to envelope B before proceeding. Fourth, in envelope C, participants make their going concern judgments on a 100-point scale ranging from 0 (certain not to continue) to 100 (certain to continue), with midpoint 50 (completely uncertain). Additionally, in the two conditions where decision process accountability is present, participants are asked to explain the reasoning behind their going concern judgments. Fifth, participants assess the relative reliability (knowledge) of the two sources on a scale ranging from 1 (Source 1 much more knowledgeable) to 9 (Source 2 much more knowledgeable), with midpoint 5 (about the same knowledge). Sixth, participants assess the significance of the financial impact of the environmental issue on a scale ranging from 1 (not

at all significant) to 9 (extremely significant), with midpoint 5 (somewhat significant).¹⁹ Finally, participants answer debriefing, comprehension check, manipulation check, and demographic questions. In the next chapter, I present my findings.

¹⁹ The going concern and financial impact judgments are not required for examination of hypotheses and research questions.

CHAPTER 4: ANALYSES AND RESULTS

In this chapter, I first report results of the manipulation and comprehension checks and, based on those, which participants are included in the analyses. I then report the results of the tests of hypotheses and research questions. Finally, I describe and report the results for two supplemental analyses—control condition comparisons and power analyses—performed to provide additional evidence related to the primary results.

4.1 MANIPULATION AND COMPREHENSION CHECKS

All participants responded to three primary manipulation check questions to verify whether the between-participants accountability manipulation was successful. Responses to the manipulation checks indicate that manipulations were somewhat successful (Table 1, Panel A). First, 92.31% of all participants responded correctly that they were informed of a potential follow-up conference to discuss their responses. Second, 83.33% of all participants responded correctly that they were informed that responses would be evaluated and scored and the related criteria. Third, 71.79% of all participants responded correctly that they were informed of a potential gift certificate prize and its basis. The rate of correct responses did not vary significantly by condition.²⁰

In addition, all participants responded to two primary comprehension check questions to verify their understanding of (1) which of the two sources was more reliable (knowledgeable) and (2) management's preference for a going concern assessment for its company. Responses to the comprehension checks indicate that participants did not always understand which source was more reliable but understood management's preference for the going concern assessment (Table

²⁰ I use the Fisher's Exact Test to determine if the rate of correct responses for each manipulation and comprehension check varied significantly across all three conditions and across each pairing of conditions. There were no significant differences (all two-tailed $p \geq 0.140$).

1, Panel B). First, 75.64% of all participants correctly identified the more reliable source. Second, 97.44% of all participants correctly identified management's preference. The rates of correct responses did not vary significantly by condition.

Including only participants who passed all five primary manipulation and comprehension checks would result in insufficient data for analyses. Therefore, participants could fail the one manipulation check regarding the potential for a prize and its basis, and still be included in the analyses, if they passed the remaining four manipulation and comprehension checks (Table 1, Panel C).²¹

4.2 TEST OF HYPOTHESES AND RESEARCH QUESTIONS

Table 2 through Table 5 report descriptive statistics for each of my dependent measures by Accountability condition (Panel A), ANOVA results (Panel B), and planned contrasts for the primary tests of my hypotheses and research questions (Panels C and D, respectively).²² I report one-tailed p-values unless otherwise indicated.²³ In addition, Appendix D through Appendix F provide detailed descriptive tables related to each dependent measure, documenting how cells are combined to lead to the values reported in the tables and used in contrast testing.

4.2.1 ACCURACY IN SOURCE ATTRIBUTIONS

The first two hypotheses and the first research question examine participants' accuracy in their source attributions. Source attribution accuracy is defined as the overall proportion of the original evidence items each participant correctly identified as old that were attributed to the

²¹When I instead analyze responses from all available 78 participants, the significance of several results weakens from significant to marginally significant (H1; H2b; H4) or insignificant (H3; RQ1; RQ2).

²² ANOVAs are run on all three accountability conditions, whereas the planned contrasts compare only the accountability conditions relevant to examining the specific hypothesis or research question.

²³ In Tables 2 through 5, n represents the number of participants who have both satisfied the manipulation/comprehension check criteria for analysis and provided responses that meet the definition of the dependent measure under consideration. Therefore, n may vary across dependent measures.

correct source. Detailed descriptive statistics are provided in Appendix D and analyses are presented in Table 2.^{24 25}

H1 predicts that when managers are accountable only for the decision process, their source attributions are more accurate compared to those of managers accountable only for the decision outcome. Table 2, Panel C reports the results of the planned contrast used to test H1 (also see Figure 1). Consistent with H1, participants in the decision outcome condition have lower source attribution accuracy (mean = 0.679) than participants in the decision process condition (mean = 0.857) ($\chi^2 = 7.00$, $p = 0.004$). This finding supports H1.

RQ1 examines whether the source attribution accuracy of managers held accountable for both outcome and process approximates that of managers accountable only for the decision process or managers accountable only for the decision outcome. Table 2, Panel D reports the results of the planned contrasts used to examine RQ1 (also see Figure 1). Participants held accountable for both outcome and process made less accurate source attributions than did participants held accountable only for their decision process ($\chi^2 = 3.96$, two-tailed $p = 0.047$). In contrast, participants held accountable for both outcome and process and participants held accountable only for their decision outcome display similar source attribution accuracy ($\chi^2 = 0.83$, two-tailed $p = 0.363$). Taken together, these findings suggest that the accuracy improvement observed under decision process accountability is mitigated by the addition of

²⁴ In source monitoring research, source memory accuracy is commonly determined based on the proportion of questions correctly identified as old that are then attributed to the correct source (e.g., Hashtroudi et al. 1989). Other measures are used (e.g., number of items) in the source monitoring paradigm depending on the research focus. However, my dependent measure is the proportion measure which is also consistent with the measures used in Gordon et al. 2005, a key paper to my study.

²⁵ My dependent variable is an average of binary variables. Some argue that a traditional analysis of variance should not be used with binary variables. To address this concern, I analyze data using a categorical analysis of variance. The procedure used performs categorical data modeling of data that can be represented by a two-dimensional contingency table, fitting linear models to functions of response frequencies.

outcome accountability, with the accuracy of participants held accountable for both outcome and process approximating that of participants held accountable for only decision outcome.

H2 predicts that managers accountable only for the decision outcome will have a greater tendency to incorrectly attribute preference-consistent information to a more reliable source (H2a)²⁶ and to incorrectly attribute preference-inconsistent information to a less reliable source or as new (H2b)²⁷ compared to managers accountable only for the decision process. Detailed descriptive statistics are provided in Appendix D and analyses are presented in Table 3.

Participants' incorrect responses are classified by preference-consistency and accountability condition in Table 3, Panel A. Table 3, Panel C reports the results of the planned contrasts used to test H2 (also see Figure 2). In support of H2a, participants in the decision outcome condition have a greater tendency to incorrectly attribute preference-consistent evidence items to a more reliable source (mean = 0.643) compared to participants in the decision process condition (mean = 0.214) ($t = 1.70, p = 0.048$). In support of H2b, participants in the decision outcome condition have a greater tendency to incorrectly attribute preference-inconsistent evidence items to a less reliable source or as new (mean = 0.643) compared to participants in the decision process condition (mean = 0.214) ($t = 1.86, p = 0.035$).

4.2.2 CONFIDENCE IN SOURCE ATTRIBUTIONS

The remaining two hypotheses and research question examine participants' confidence in their source attributions. H3 predicts that managers accountable only for the decision outcome have greater relative confidence in their preference-consistent source attributions than in their

²⁶ This error could occur in two ways: a participant could (1) correctly identify the item as previously viewed but incorrectly attribute the item to the more reliable source, or (2) incorrectly identify the item as previously viewed and then attribute the item to the more reliable source.

²⁷ This error could occur in two ways: a participant could (1) correctly identify the item as previously viewed but incorrectly attribute the item to the less reliable source, or (2) incorrectly identify the item as new but item previously viewed and provided by the more reliable source.

preference-inconsistent source attributions compared to managers accountable only for the decision process. Detailed descriptive statistics are provided in Appendix E and an example confidence calculation is provided in Appendix G, Panel A. Analyses are presented in Table 4. For H3, the preference consistency of source attributions is determined by *participants' responses*. That is, source attributions are preference-*consistent* if participants either a) identify the source of preference-consistent evidence items as the more reliable source or b) identify the source of preference-inconsistent evidence items as the less reliable source. Source attributions are preference-*inconsistent* if participants either a) identify the source of preference-inconsistent evidence items as the more reliable source or b) identify the source of preference-consistent evidence items as the less reliable source. I then compute the *difference* between each participant's confidence in preference-consistent source attributions and his or her confidence in preference-inconsistent source attributions. Because people are generally more confident in accurate source attributions than in inaccurate source attributions (e.g., Johnson et al. 1996) with the potential for ceiling effects in confidence assessments for accurate source attributions, I examine H3 separately for accurate and inaccurate source attributions (Table 4).²⁸

Table 4, Panel C reports the results of the planned contrasts to test H3 (also see Figure 3). For accurate source attributions, the confidence difference score for participants in the decision outcome condition (mean = 0.194) is greater than the confidence difference score for participants in the decision process condition (mean = -1.150) ($t = 1.50, p = 0.075$). For inaccurate source attributions, the confidence difference score for participants in the decision outcome condition

²⁸ Participants' responses determine how attributions are classified. Thus, there is an issue of non-independence, with classifications potentially differing across confidence levels (i.e., an item selection artifact). This is a potential limitation in interpreting H3 results; however, such item selection artifacts are a general issue for papers in which participants' responses determine classifications (e.g., see discussion in Butler et al. 2009, Hawley and Johnston 1991, and Horton 1987).

(mean = 1.194) is greater than the confidence difference score for participants in the decision process condition (mean = -0.633) ($t = 2.06, p = 0.027$). These findings support H3.

H4 predicts that when managers are accountable only for the decision process, their confidence in source attributions is better calibrated compared to that of managers accountable only for the decision outcome. Calibration is determined based on the calibration index²⁹ (e.g., Murphy 1973; Siegel-Jacobs and Yates 1996; Tetlock and Kim 1987). A smaller calibration index indicates better calibration. Because the effects on calibration may potentially differ depending on preference consistency, I examine H4 (and RQ2) separately for preference-consistent and preference-inconsistent source attributions. For H4, the preference consistency of source attributions is determined by the *evidence items* only. That is, source attributions are *preference-consistent* if they relate to preference-consistent evidence items, and source attributions are *preference-inconsistent* if they relate to preference-inconsistent evidence items. Detailed descriptive statistics (for H4 and RQ2) are provided in Appendix F and an example calibration index calculation is provided in Appendix G, Panel B. Analyses are presented in Table 5. Table 5, Panel C reports the results of the planned contrast of interest used to test H4 (also see Figure 4). In support of H4, participants in the decision process condition are better calibrated (mean = 0.074) compared to participants in the decision outcome condition (mean = 0.165) ($t = 2.01, p = 0.026$) for preference-consistent source attributions. However, inconsistent with H4, participants in the decision process condition (mean = 0.144) have similar calibration as participants in the decision outcome condition (mean = 0.157) for preference-inconsistent source attributions ($t = 0.29, p = 0.387$).

²⁹ The calibration index is calculated as $(1/N)\sum_j N_j(f_j - \hat{d}_j)^2$, where N refers to the total number of confidence assessments made, N_j refers to the number of times a particular confidence assessment level is selected, f_j refers to the corresponding probability for a particular confidence assessment level, and \hat{d}_j refers to the proportion of times the response is accurate for a particular confidence assessment level.

RQ2 examines whether the confidence of managers held accountable for both outcome and process is calibrated similarly to managers accountable only for the decision process or managers accountable only for the decision outcome. Table 5, Panel D reports the results of the planned contrasts used to examine RQ2 (also see Figure 4). Recall that the findings from RQ1 suggest that the accuracy improvement observed under decision process accountability is mitigated by the addition of outcome accountability, with the accuracy of participants held accountable for both outcome and process approximating that of participants held accountable for only decision outcome. A similar pattern is present for RQ2 examining confidence for preference-consistent source attributions. Participants held accountable for both outcome and process are marginally less calibrated than participants held accountable for only the decision process ($t = -1.59$, two-tailed $p = 0.119$), and do not calibrate differently from participants held accountable for only the decision outcome ($t = 0.54$, two-tailed $p = 0.594$). For preference-inconsistent source attributions, participants' calibration did not differ across conditions (both contrasts two-tailed $p \geq 0.616$).

4.3 SUPPLEMENTAL ANALYSES

The hypotheses tests above focus on comparing source attribution accuracy and bias and appropriateness of confidence in source attributions for participants accountable only for the decision outcome versus only for the decision process. Although the results reported above generally suggests improvement if managers are held accountable for the decision process rather than the decision outcome, it is unclear whether these benefits are due to the *presence* of process accountability or the *absence* of outcome accountability. Therefore, I perform supplementary analyses using a control condition (in which neither process nor outcome accountability are present) as described in more detail below. In addition, it is unclear whether insignificant

differences found for the research questions tests (and the control condition supplemental analyses) are due to insufficient power. Therefore, I also report power analyses to determine what sample sizes would be needed to detect significant differences, if present.

4.3.1 CONTROL CONDITION ANALYSES

To provide some evidence on whether improvements noted in the main results are due to the presence of process accountability or the absence of outcome accountability, I conduct supplementary analyses (untabulated) comparing the control (not accountable) condition to the process only accountability condition.³⁰ If participants accountable only for the process demonstrate significant improvement over control condition participants, this would suggest that benefits are due to the presence of process accountability. If not, this would suggest that benefits are due to the absence of outcome accountability.³¹ Generally, I find insignificant differences between participants in the control and decision process only conditions based on the supplemental analyses performed, which I describe below in more detail. Therefore, the source of the benefits is more likely due to the absence of outcome accountability.³²

The supplemental analysis for H1 related to source attribution accuracy indicates that participants in the decision process only condition have similar source attribution accuracy (mean = 0.857) as participants in the control condition (mean = 0.825) ($t = 0.034$, two-tailed $p = 0.561$). Also, the supplemental analysis for H2a related to attributions of preference-consistent

³⁰ I do not perform a supplemental analyses for H3 (confidence difference) because the control condition only has one observation. Therefore, the limited sample size for the control condition would limit the meaningful interpretation of the H3 supplemental results.

³¹ As noted previously in footnote 16, the significance of the results and related inferences of the planned contrasts used to examine the hypothesis and research questions remain unchanged if control condition responses are included as a between-participants condition in the ANOVAs.

³² I also confirm that differences between the control condition and outcome only accountability condition are generally significant. Specifically, difference is significant for H1, H2a, H2b, and H4 preference-inconsistent, but not for H4 preference-consistent. Analysis of H3 is omitted due to insufficient data, as described in footnote 30. Overall, these results also support that benefits are more likely due to the absence of outcome accountability.

evidence items indicates that participants in the decision process condition have a similar tendency to incorrectly attribute preference-consistent evidence items to a more reliable source (mean = 0.214) compared to participants in the control condition (mean = 0.200) ($t = 0.06$, two-tailed $p = 0.950$). Further, the supplemental analysis for H2b related to attributions of preference-inconsistent evidence items indicates that participants in the decision process condition have a similar tendency to incorrectly attribute preference-inconsistent evidence items to a less reliable source or as new (mean = 0.214) compared to participants in the control condition (mean = 0.267) ($t = -0.24$, two-tailed $p = 0.808$).

The supplemental analyses for H4 related to calibration indicates for *preference-consistent* evidence items, participants in the decision process condition have similar calibration (mean = 0.074) as participants in the control condition (mean = 0.104) ($t = -0.66$, two-tailed $p = 0.511$). However, for *preference-inconsistent* evidence items, participants in the decision process condition are less calibrated (mean = 0.144) compared to participants in the control condition (mean = 0.064) ($t = 1.97$, two-tailed $p = 0.053$).

Based on the above supplemental analyses, participants in the decision process only condition generally have similar responses as participants in the control condition. These results support that benefits observed with decision process only (compared to decision outcome only) are due to the absence of outcome accountability rather than the presence of process accountability. However, given managers are often held accountable for either or both the decision outcome and the decision process, my results are also suggestive of the potential need to de-emphasize outcome accountability and emphasize process accountability when both types of accountability are present.³³

³³ Although a reasonable conjecture, this potential implication is not directly tested in my dissertation, thus providing an opportunity for future research. For example, a future study could compare the combined “decision

4.3.2 POWER ANALYSES

One possible explanation for the insignificant differences found for the control condition supplemental analyses (comparing responses to the process only condition) and for the research questions (comparing responses from participants accountable for both outcome and process to responses from those accountable for outcome only) is that the related sample sizes are not large enough to reject the null hypotheses of no difference. To examine this possibility, I perform power analyses (untabulated) to determine what sample sizes would be needed to detect significant differences, if present.³⁴ For sensitivity, analyses are performed at varying power levels, ranging from 0.80 to 0.95, in 0.05 increments. The dependent variables for H1 and RQ1 are proportions. Therefore power analyses for two independent proportions are used related to H1 and RQ1.³⁵ Otherwise, two-sample t-test power analyses are performed.^{36 37} The larger the indicated sample size, the more likely it is that a difference is insignificant and that insufficient power is not the issue. The smaller the indicated sample size, the more likely it is that the difference is significant and that insufficient power is the issue, suggesting that increasing sample sizes in a planned follow-up experiment may result in finding significant differences.

outcome and decision process” condition as manipulated in this study (which likely includes both outcome and process equally) to other combined outcome and process accountability conditions that place differential emphasis on each component (e.g., one which de-emphasizes outcome, or one which emphasizes process) in order to examine the impact of emphasis on source attribution accuracy and confidence.

³⁴ The primary purpose of a power analysis is to help plan a future study. However, power analyses are also used here to provide suggestive evidence regarding whether the current study has sufficient power to detect significant differences between applicable conditions.

³⁵ An example of SAS code used for the H1 control condition versus process only condition two independent proportions power analysis is as follows: `proc power; twosamplefreq test = fisher groupproportions = (.825 .857) power = .8 .85 .9 .95 npergroup = .; run;`

³⁶ An example of SAS code used for the H2a control condition versus process only condition two-sample t-test power analysis is as follows: `proc power; twosamplemeans test = diff_satt meandiff = .014 groupstddevs = .414 |.426 power = .8 .85 .9 .95 npergroup = .; run;`

³⁷ I do not perform power analyses for H3 (confidence difference) because the control condition only has one observation. Therefore, the limited sample size for the control condition would limit the meaningful interpretation of the H3 supplemental results.

I find that very large sample sizes would be required based on all power analyses performed, which I describe below in more detail. This suggests that insufficient power is not the issue.

The H1 power analysis for source attribution accuracy indicates the estimated number of participants required per condition to detect a potential significant difference between the control condition and the process only accountability condition ranges from 2,108 (power = 0.80) to 3,449 (power = 0.95). This suggests there is not a power issue and the control condition and process only condition are not significantly different for H1. Similarly, the RQ1 power analysis for source attribution accuracy indicates the estimated number of participants required per condition to detect a potential significant difference between the both outcome and process accountability condition and the outcome only accountability condition ranges from 817 (power = 0.80) to 1,332 (power = 0.95). This also suggests there is not a power issue and the both condition and outcome only condition are not significantly different for RQ1.

The H2a power analysis for the tendency to incorrectly attribute preference-consistent evidence items to a more reliable source indicates the estimated number of participants required per condition to detect a potential significant difference between the control condition and the process only accountability condition ranged from 14,132 (power = 0.80) to 23,397 (power = 0.95). This suggests there is not a power issue and the control condition and process only condition are not significantly different for H2a. Similarly, the H2b power analyses performed for the tendency to incorrectly attribute preference-inconsistent evidence items to a less reliable source or as new indicates the estimated number of participants required per condition to detect a potential significant difference between the control condition and the process only accountability condition ranged from 1,095 (power = 0.80) to 1,811 (power = 0.95). This also suggests there is

not a power issue and the control condition and process only condition are not significantly different for H2b.

The H4 power analysis for calibration indicates the estimated number of participants required per condition to detect a potential significant difference between the control condition and the process only accountability condition for *preference-consistent* source attributions ranged from 237 (power = 0.80) to 392 (power = 0.95). For preference-consistent source attributions, this suggests there is not a power issue and the control condition and the process only accountability condition are not significantly different for H4.

The RQ2 power analyses performed for calibration indicate the estimated number of participants required per condition to detect a potential significant difference between the both outcome and process accountability condition and the outcome only accountability condition for *preference-consistent* source attributions ranges from 469 (power = 0.80) to 775 (power = 0.95) and for *preference-inconsistent* source attributions ranges from 399 (power = 0.80) to 660 (power = 0.95). For preference-consistent and preference-inconsistent source attributions, this suggests there is not a power issue and the both condition and outcome only condition are not significantly different for RQ2.

Another possible explanation for the insignificant differences, not captured by the above power analyses, is that there are an insufficient number of repeated measures in my experiment. In the next chapter, I discuss future research that might address this possibility. For example, a follow-up experiment could increase the number of original and new evidence items for the source monitoring recognition task. In addition to the follow-up experiment, the next chapter discusses other potential limitations of my study and opportunities for future research.

CHAPTER 5: DISCUSSION AND FUTURE RESEARCH

My study provides evidence on the implications for the influence of motivated reasoning in judgments and decisions when managers are held accountable for either or both the decision outcome and the decision process. I begin this chapter with a discussion of the implications and limitations of my experiment. I identify two potential concerns with my experiment and other limitations that provide an immediate opportunity for future research, which I discuss below as shorter term research goals. In addition, my dissertation has the potential for broader applications, which I describe below in longer term research goals.

5.1 DISCUSSION OF EXPERIMENT FINDINGS AND LIMITATIONS

My results generally indicate that, compared to process-accountable participants, outcome-accountable participants make less accurate source attributions, report greater differences in confidence consistent with preferences, and have lower calibration. In addition, results indicate that, compared to process-accountable participants, participants accountable for both outcome and process make less accurate source attributions and have lower calibration. Given managers are often held accountable for either or both the decision outcome and the decision process, an implication of these results is that motivated reasoning will influence judgments and decisions less when outcome accountability is absent and process accountability is present.

However, there are two potential concerns with the going concern setting in my dissertation that provide an opportunity for future research. First, one may question whether memory has a significant role in the going concern assessment. In making this assessment, management would be required to “take into account available information about the foreseeable future, which is generally, but not limited to, 12 months from the end of the reporting period”

(FASB Project Update – *Going Concern*). In the post-SOX environment, with an emphasis on the adequacy of the financial reporting information system, management’s going concern assessment may be expected to be a well-documented process, implying less reliance on memory. Therefore, one may believe that the prior research demonstrating that professionals rely on memory even when documentation is available (e.g., Birnberg and Shields 1984; Kida and Smith 1995; Libby and Trotman 1993; Moeckel and Plumlee 1989), and that the going concern assessment involves memory (Rau and Moser 1999; Ricchiute 1997; Ricchiute 1999) may no longer apply to the current financial reporting environment. However, the post-SOX requirements that support this concern are not yet applicable to a significant number of public companies (i.e., SOX section 404 compliance for non-accelerated filers remains pending).

Second, the preference for a positive going concern assessment is particularly strong because it determines the basis of accounting to be applied to the financial statements (i.e., going concern versus liquidation basis). The resulting strength of the goal commitment may overwhelm any potential effects of process accountability. For example, Kadous et al. (2003) find that when auditors have a strong goal commitment, requiring a quality assessment is a threat to reaching their directional goal. As a result, auditors increase their efforts to justify the preference, resulting in less objectivity. This is consistent with McNamara et al.’s (2002) finding that loan officers’ judgments about borrowers’ credit risk are overly-favorable when indicating a decline in creditworthiness would trigger negative personal consequences. A similar effect could occur in the management going concern assessment setting. That is, given management’s strong preference and goal commitment, accountability for the decision process may represent a threat to managers reaching their directional goal of a positive going concern assessment. Therefore, they may increase their efforts to justify their preference resulting in biased processing. This

argument biases against finding significant differences related to process accountability for my hypotheses and research questions. A planned follow-up study to address these concerns is described below in my discussion of shorter term research goals.

My study is subject to several other limitations that can be addressed by modifying materials, also included in my discussion of shorter term research goals below. First, sample sizes are limited. A contributing factor is low rates of correct responses on some manipulation and comprehension checks. An additional factor contributing to this is that participants completed the distracter task faster than anticipated, perhaps leading to a less difficult memory task and, thus, a limited number of inaccurate responses (e.g., used to examine confidence). Second, as discussed related to the supplemental power analyses, an insufficient number of repeated measures may have contributed to insignificant differences. Finally, the accountability manipulation involves comparison to experienced professionals assuming a similar role as participants. Although this was intended to reinforce the preference, it is possible the comparison introduced an unintended accuracy goal. As noted in my discussion of shorter term research goals below, these limitations will also be addressed by modifying materials.

Of course, any experiment will also include natural limitations because it represents a simplification of the real world context. For example, despite post-task responses indicating that participants found the current experiment to be generally realistic and interesting, the evidence items presented to participants were limited in number, and participants may have believed that the evidence items were insufficient for making the going concern and financial impact judgments. As a second example, I only use one preference in this study, but managers can have multiple preferences. A future research study with a richer data set could examine additional preferences. However, these issues often focus on the mundane realism of the experimental

context, rather than on notable mediators or moderators. Therefore, in terms of my longer term research goals, I instead focus on the generalizability of my study in terms of broader memory concepts, such as pattern recognition, and in terms of other decision makers, such as in audit settings. I provide an initial discussion of each below in the section on longer term research goals.

5.2 SHORTER TERM RESEARCH GOALS

As noted, my application of a going concern setting in the experiment leads to two potential concerns: 1) the significance of the role of memory and 2) the potential overwhelming effect of a particularly strong preference and goal commitment. To address these concerns, I recommend a follow-up study, described below, involving a similar environmental liability issue but without the related going concern implications. In addition, materials will be adapted to address several other limitations of the current study discussed above (i.e., sample size, number of repeated measures, and comparison group).

5.2.1 SETTING

In the follow-up experiment, participants will assume the role of a company manager responsible for evaluating a potential contingent liability for his/her company. There are various types of contingent liabilities (e.g., related to receivables collectability, product warranty, environmental liabilities, and litigation), and their evaluation is important for many companies (e.g., Barth and McNichols 1994; Kennedy et al. 1998). As with the going concern setting applied in my experiment, the contingent liability setting is also an interesting context for my study, but avoids the two concerns about memory significance and overwhelming preferences potentially present in the going concern setting.

First, contingencies involve uncertainty as to their outcome and there is some latitude in applying the applicable financial reporting standard. Statement of Accounting Standards (SFAS) No. 5 (*Accounting for Contingencies*) indicates the financial reporting for contingent liabilities depends on two criteria: 1) the likelihood that a liability has been incurred and 2) whether the amount of the liability can be reasonably estimated. Application of these criteria requires considerable judgment. The specific contingent liability examined in this study is a potential environmental liability (similar to that noted above in the experiment). Although an environmental liability is common for many companies, its evaluation is non-routine. Therefore, this evaluation involves more uncertainty and subjectivity relative to some other types of contingent liabilities (e.g., collectability of receivables). Thus, the use of memory—a key feature for my study—is also supported in this contingent liability evaluation as prior research on managers' information seeking behavior indicates that managers prefer verbal communication when there is high uncertainty in the task environment, and this is particularly true of higher management levels faced with greater ambiguity and uncertainty (e.g., de Alwis et al. 2006; O'Reilly 1982). Therefore, this new setting avoids the potential concern regarding the continuing significance of memory in the going concern setting.

Second, as noted previously, the preference for a positive going concern assessment is particularly strong because it also determines whether a company's financial statements will be reported on a going concern versus liquidation basis. Therefore, the resulting strength of the goal commitment may overwhelm any potential effects of process accountability. The contingent liability setting will not have any implications for a going concern assessment, only for whether the liability should be recognized or disclosed. Therefore, this new setting avoids the potential concern regarding an overwhelming preference and goal commitment.

The contingent liability setting also provides the other key features necessary for my study. That is, the determination of a potential contingent liability may be influenced by management's general preference to find that its company has not incurred a reportable loss. For example, this would support the company's compliance with debt covenants and positively impact the company's financial ratios. In addition, managers will likely gather information from various sources in evaluating a contingent liability, and gather more types of information from various sources—internal and external to a company—in a non-routine evaluation (e.g., environmental liability) than they would in a more routine evaluation (e.g., collectability of receivables). Finally, the contingent liability evaluation will likely involve both types of accountability. Managers are held accountable for the decision outcome because of the potential consequences due to reactions of important stakeholders. For example, a creditor may be willing to extend credit only at higher interest rates to compensate for increased company risk if the contingent liability is reportable. Managers are also held accountable for their decision process because there is a general expectation that management decisions are subject to review, as noted previously.

5.2.2 PARTICIPANTS

Participants will be master's level business students at a large public university.³⁸ For the 1 x 3 between-participants portion of the design, a minimum of 60 participants will be needed (20 per treatment condition). Participants will assume the role of a company manager responsible for determining the likelihood and estimability of a potential contingent liability for financial reporting purposes. The use of master's level business student participants in this study

³⁸ Preferred student participants are MBA students as they are more likely to have, or to a greater extent, the qualities discussed as reasons master's level business students are appropriate for this study. Related future research may involve actual manager participants, if available.

is appropriate for the same reasons noted in section 3.1. In addition to likely training to become managers or for positions in which they will interact with managers, they may also have some related business experience. Use of more advanced students who may attend more closely to task information and have a better understanding of management's preference may help improve passage of manipulation and comprehension checks, addressing the limitation regarding insufficient sample sizes.

5.2.3 MATERIALS AND PLANNED ANALYSES

The experimental design and case materials will be similar to that used in my dissertation experiment, with some modifications to eliminate references to a going concern impact and to focus instead on the determination of the potential contingent liability for financial reporting purposes. Therefore, descriptions will relate to the environmental liability likelihood and estimation judgments for the financial reporting decision. In addition, the manipulation of evidence type will be modified to indicate preference-consistent implication evidence suggests the liability is not likely or not estimable and preference-inconsistent implication evidence suggests the liability is likely or estimable. The comprehension and manipulation check questions will also be modified accordingly.

Experimental materials will also be modified to address these limitations regarding sample sizes (by improving the distracter task and increasing number of repeated measures) and regarding comparison to experienced professionals (by modifying use or nature of comparison group). Otherwise, the method and planned analyses will be similar to that in the current study.

5.3 LONGER TERM RESEARCH GOALS

In terms of my longer term research goals, I would like to expand my dissertation to how the effects in my dissertation may generalize to two additional settings: manager pattern

recognition and auditor source memory. There are many tasks in which managers rely on their memory beyond straight recall of information. Therefore, my study could be extended to examine broader concepts of memory, such as pattern identification, mental models, or information interpretation. In addition, accurate source memory is important in terms of other decision makers, such as in audit settings. Auditors gather evidence from various sources, and the source of evidence itself is informative as to the extent of reliance they should place on that evidence. I discuss two potential future research extensions relating to manager pattern recognition and auditor source memory in brainstorming in more detail below.

5.3.1 MANAGER PATTERN RECOGNITION

A potential extension of my dissertation is to examine managers' pattern recognition. As discussed previously, I anticipate that through their business, industry, and company experience, managers develop cognitive frameworks that allow them to identify patterns in information relevant to their judgment and decision making. As with auditors, I anticipate pattern recognition is particularly important to managers' complex judgment and decision making (e.g., Bedard and Biggs 1991; Hammersley 2006; Morwitz and Schmittlein 1998). Future research could examine whether managers are more likely to recognize a pattern that has preference-consistent implications compared to preference-inconsistent implications, and if this is influenced by holding managers accountable for the decision outcome versus the decision process. For pattern recognition, it is important that all cues forming the pattern are perceived and appropriately processed (Craik and Lockhart 1972; Hammersley 2006). Therefore, if decision process accountability promotes more appropriate information processing relative to outcome accountability, pattern recognition may be more accurate or of higher quality with decision process accountability than with outcome accountability.

The four key features necessary to generalize my theory—the potential for both outcome and process accountability, a general preference, use of memory, and a task where information is gathered from various sources—would also be present in an examination of pattern recognition. As discussed previously, managers are commonly held accountable for their decision outcome and/or decision process and often have preferences for their judgment and decision making. These two features would also be present in examining pattern recognition, as long as the underlying task is appropriate. Pattern recognition itself is the use of memory and is necessary for complex management judgment and decision making. Finally, the cues combined in pattern recognition serve as sources of information.

In accounting research, pattern recognition has generally been examined in audit contexts (e.g., use in analytical review—Bedard and Biggs 1991; effect of auditor industry-specialization—Hammersley 2006). My suggested extension would contribute to this pattern recognition research stream by examining pattern recognition in managers' judgment and decision making, and if this is influenced by motivated reasoning and accountability.

5.3.2 AUDITOR SOURCE MEMORY

The focus of my dissertation is on managers' source attributions. However, another potential extension of my dissertation is to generalize my study to an audit setting. For example, future research could examine source attributions within the context of auditor brainstorming.

SAS No. 99 requires that auditors participate in a brainstorming session during the planning phase of the audit. The purpose of a brainstorming session is for members of the audit team—with varying levels of experience—to exchange ideas regarding how and where an entity's financial statements might be susceptible to material misstatement due to fraud. SAS No. 99 also requires documentation of the risks of material misstatement identified during the

brainstorming session. However, the extent of this documentation varies. For example, risks could be discussed and summarized in terms of general conditions that could give rise to fraud, or may be documented with a more specific memo of the specific risks identified, in addition to the summary information (Hammersley et al. 2010). Risk could also be documented by simply checking off items on checklists and standard audit programs (e.g., Hammersley et al. 2010). More limited documentation may be in response to auditor concerns about litigation exposure. For example, a SAS No. 99 practice aid cautions against documenting the specific fraud risk identified during brainstorming sessions (AICPA 2004; Reffett 2010). Subsequent to the brainstorming session, auditors assess initial fraud risk. The more limited the documentation of risk identified during brainstorming, the larger is the burden on auditors to recall the risks discussed (Hammersley et al. 2010).

The four key features necessary to generalize my theory are present in an auditor brainstorming setting. As discussed above, brainstorming involves the exchange of information among audit team members (i.e., various sources of information) and the use of memory. In addition, prior research has shown auditor judgments and decisions are influenced by motivated reasoning (e.g., Hackenbrack and Nelson 1996; Wilks 2002). I see no reason why this would not also apply in a brainstorming context. In addition, with brainstorming, auditors have the potential to be held accountable for the outcome (i.e., whether a fraud actually occurred) and/or process (i.e., basis for the fraud risk assessment).

Prior brainstorming research, for example, has examined the effect of brainstorming on fraud risk assessment (e.g., Carpenter 2007) and modification of audit procedures given high fraud risk (e.g., Hoffman and Zimbelman 2009). Brainstorming research has also examined how the specificity of identified risk documentation affects fraud risk assessment and evidence

evaluation (Hammersley et al. 2010). The extension of my study would contribute to this stream of research by examining motivated reasoning in brainstorming, in the context of source attributions. Misattribution of the source of an identified risk could lead to inappropriate consideration of that risk in making the risk assessment, all else equal. This could affect audit effectiveness and/or audit efficiency.

In the final chapter, I summarize my dissertation research and findings, and discuss my dissertation's theoretical contributions and practical implications.

CHAPTER 6: SUMMARY

My dissertation examines how the type of accountability (outcome or process) interacts with managers' situational preferences to influence management's accuracy and confidence in its memory for the *source* of information used in its financial reporting judgments and decisions. I integrate accountability theory, motivated reasoning, and a source monitoring framework from psychology to test my predictions and examine my research questions. I predict and find that participants accountable only for the decision process make more accurate source attributions than do participants accountable only for the decision outcome. A tendency to incorrectly attribute both preference-consistent information and preference-inconsistent information drives the reduction in accuracy. I also predict and find that participants report a greater difference in confidence between preference-consistent and preference-inconsistent source attributions when participants are held accountable only for the decision outcome compared to participants accountable only for the decision process. In addition, I predict and find that participants are better calibrated when they are held accountable only for the decision process rather than only the decision outcome, but only for preference-consistent source attributions.

Further, I examine a boundary condition for the benefits of using process accountability only when participants are held accountable for both their decision outcome and decision process. I find that participants accountable for both process and outcome have lower source attribution accuracy and are less calibrated for preference-consistent source attributions compared to participants accountable only for the decision process.

My dissertation contributes to our understanding of the relation between motivated reasoning and memory, extending prior accounting and psychology research. I also extend the application of motivation reasoning theory by examining another mechanisms through which motivated reasoning may affect memory—accuracy (rather than type) of information recalled.

Finally, my results have practical implications for improving financial reporting. That is, results suggest that if held accountable, managers focused on the decision process, rather than the decision outcome, are more objective in assessing supporting evidence for their financial reporting judgment and decision making. Thus, using process accountability rather than outcome accountability may improve the accuracy of information on which users base their resource allocation decisions.

My dissertation provides opportunities for both shorter term and longer term research. In the shorter term, I anticipate a follow-up study using a contingent liability setting without going concern implications. This will address two potential concerns with the going concern setting used in my dissertation experiment—the significance of the role of memory and the potential overwhelming effect of a particularly strong preference and goal commitment. In addition, experimental materials will be modified for this follow-up study to address other limitations related to sample size, number of repeated measures, and the comparison group. In the longer term, my dissertation research could be generalized to examine additional settings, e.g. manager pattern recognition and auditor source memory, and to examine justification behavior in general. Further, a future study with a richer data set could also examine additional preferences.

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APPENDIX A: EVIDENCE ITEMS^a

Panel A: Preference-Consistent Evidence Items

- Nick indicates that one tank did not completely leak and the remaining liquids must be removed. This process should be inexpensive because Holt already has the equipment required for the removal.
- Nick indicates the underground water source that supplies nearby communities is a confined aquifer, situated below a strong barrier. There is only a remote chance the drinking water supply has been contaminated.
- Andrew indicates there was little governmental regulation of underground storage tanks when the tanks were installed. Therefore, any fines and penalties for related non-compliance with environmental laws will be minimal.
- Andrew indicates a low cost emerging technology may be used for the soil cleanup effort. It is probable the Environmental Protection Agency will approve this approach given its promotion of improvements in remediation technology.

Panel B: Preference-Inconsistent Evidence Items

- Andrew indicates some of the underground storage tanks leaked. The leaked substance is a suspected carcinogen that has contaminated the surrounding soil and groundwater.
- Nick indicates a system to pump and treat the groundwater is needed. The common procedure for such groundwater cleanup is expensive.
- Andrew indicates the underground storage tanks should be permanently taken out of service. This process will be expensive because the tanks will need to be removed from the ground.
- Nick indicates no additional potential responsible parties that contributed to the leakage have been identified. The company most likely will be responsible for the entire cleanup costs.

Panel C: Neutral Evidence Items

- Nick indicates he attended a public forum regarding environmental conservation issues. The forum was well-organized and informative.
- Andrew indicates a helpful overview of the general environmental cleanup process has been developed. This can be distributed to interested employees.
- Andrew indicates the statutory authority for underground storage tank regulation is the Resource Conservation and Recovery Act. This can be accessed on the internet.
- Nick indicates his summary report will be completed shortly. The report is currently being finalized in word processing.

a Panels A, B, and C list the *preference-consistent* (i.e., positive going concern implication), *preference-inconsistent* (i.e., negative going concern implication), and *neutral* (i.e., inducing no preference as no going concern impact) evidence items, respectively. Preference-consistent and preference-inconsistent evidence items are used to examine the formal hypotheses and research questions. The neutral evidence items are primarily used to provide a more realistic memory task by increasing the number of evidence items participants considered. Half of each of the three types of evidence items is provided by each source. Evidence items were presented to participants in eight versions in order to vary which source is described first, which source provides which set of positive and negative evidence items, and which subset of evidence items (two of each evidence type) is presented as part of the original evidence or only on the source recognition test. However, the evidence items are the same across all accountability conditions, and are randomized in the same way within accountability condition (i.e., evidence items are intermingled and not presented by type as noted above).

APPENDIX B: SOURCE DESCRIPTIONS^a

Panel A: More Reliable Source

Nick Robinson (Environmental Engineer)

- Nick Robinson has over ten years experience in the environmental field, including experience in environmental risk, hazardous waste management, and environmental regulatory compliance. Nick has Bachelor's degree in Chemical Engineering and a Master's degree in Environmental Engineering. He is certified as a Hazardous Materials Specialist and as a Professional Engineer, and is a Certified Groundwater Professional. He has worked at a well-respected consulting firm for six years.

Panel B: Less Reliable Source

Andrew Lewis (Plant Engineer)

- Andrew Lewis has three years experience in maintenance and systems engineering, including experience in electronic control technology, waste heat recovery system, and various combustion and emission control systems. Andrew has a Bachelor's degree in Mechanical Engineering. He is a certified safety member with a Level 1 Basic Certification. He has worked at Holt for one year.

^a Panels A and B indicate the source reliability descriptions participants received for the *more* and *less* reliable sources, respectively. Source reliability is varied based on description of the source's experience and education, and whether the source is internal or external to the company.

APPENDIX C: EXPERIMENTAL MATERIALS

DECISION OUTCOME ONLY CONDITION ALTERNATE

Extra Credit Identification #: _____

Who, What, Why, Where, When

This research study is being conducted by Paula Sanders (Doctoral Candidate) under the supervision of Joel Pike (Assistant Professor) from the University of Illinois at Urbana-Champaign. This research will provide valuable insights into how managers judge a firm's ability to continue to operate. Your participation in this study is important, and I thank you for taking time to assist me with this research.

If you agree to participate, you will be asked to read company evidence, provide judgments based on that evidence, and answer brief questions about your judgments and experience. You will also be asked to provide demographic information and to perform a general task. Please read the information carefully and answer the questions in the order presented. Do not seek outside information while completing the study. I am only interested in your responses to the specific information provided. I estimate that you should be able complete this written part of the study in approximately 40 minutes. In addition, you may be selected for a follow-up conference with you and a member of the Department of Accountancy faculty (not your course instructor) who will assume the role of a Board of Directors member. If you are selected, this meeting will last no more than 5 to 10 minutes.

Risks & Benefits

Your participation is valuable in helping to learn more about how management judgments are made. You can request a summary of the results, which may help facilitate discussions with others about the implications of company information used in making judgments. There are no known risks or costs to participation beyond those encountered in ordinary life.

Remuneration

In return for your participation, you will have the opportunity to receive up to 10 extra credit points as arranged with your course instructor. Extra credit will be earned based on your correct responses to certain questions. However, if selected, you must be willing to participate in the follow-conference to receive the extra credit earned. Also in return for your participation, you will have the opportunity to win a gift certificate prize. You will be asked to sign a receipt for any prize received. There will be one \$10 gift certificate available for every 15 participants. These prizes will be awarded to participants with the top scores. Scores will be based on comparison of responses with those of experienced professionals. Winners will be notified by email no later than December 8. Participants can also confirm whether they have won one of the additional prizes by contacting Paula Sanders (psanders@illinois.edu; 217-265-8198) after December 8. If you do not wish your responses to be included in the study, you may still earn the extra course credit and be eligible for a prize by completing the experiment as an academic exercise and clearly indicating your choice on the front of any envelope containing your completed materials. However, you must submit a complete set of experimental responses and, if selected, be willing to participate in the follow-conference to be eligible for a prize.

Voluntariness

Your participation in this study is voluntary. You may decline to answer any questions or discontinue participation at any time without penalty. Your decision to participate, decline, or withdraw from participation will have no additional effect on your grades at, status at, or future relations with the University of Illinois.

Given that your instructor (Professor Joel Pike) is involved in supervising this study, he will not know which of you chose to participate in the study or not until after grades have otherwise been assigned. Therefore, after completing the study, I will send your TA a confirmation that you participated so that the TA can award your extra credit at the end of the semester. Your TA is not associated with this research study. Your instructor will not have access to any of your responses to the study questions that include any identifying information.

Confidentiality

The responses you provide will be treated as confidential. Responses will be kept in data files stored by the researcher. Publications or presentations of findings will include only aggregated or anonymous data.

Who to Contact

For questions about the study, please contact Paula Sanders (psanders@illinois.edu; 217-265-8198). You may also contact Professor Joel Pike (joelpike@illinois.edu; 217-244-8993). For questions about your rights as a participant, please contact the University of Illinois Institutional Review Board office (irb@illinois.edu; 217-333-2670).

A copy of this consent form will be available to take with you for your records.

Consent Agreement

I am at least 18 years of age or older. I have read and understood the above statement, and I agree to participate in this research study.

Signature

Printed Name

Date

If you would like to receive a brief summary of the research findings, please print your email address below. I expect the summary will be available during Spring 2011.

DECISION PROCESS ONLY CONDITION AND BOTH DECISION OUTCOME AND DECISION PROCESS CONDITION ALTERNATE

Extra Credit Identification #: _____

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CONTROL CONDITION ALTERNATE

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If you agree to participate, you will be asked to read company evidence, provide judgments based on that evidence, and answer brief questions about your judgments and experience. You will also be asked to provide demographic information and to perform a general task. Please read the information carefully and answer the questions in the order presented. Do not seek outside information while completing the study. I am only interested in your responses to the specific information provided. I estimate that you should be able complete this study in approximately 40 minutes.

Risks & Benefits

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Signature

Printed Name

Date

If you would like to receive a brief summary of the research findings, please print your email address below. I expect the summary will be available during Spring 2011.

GENERAL INSTRUCTIONS

Your primary goal while completing this case is to make a series of judgments based on and about the evidence provided. In addition, you will be asked a number of questions about your background and your experience.

The information included in the case is not intended to be completely representative of what would normally be available when you make judgments about a company. However, the amount of information provided should be sufficient for you to make reasonable judgments. Please make the best judgments you can. I am most interested in your responses to the information provided.

This study consists of three parts, each provided in a separate envelope (A, B, and C). **Note that the first part (Envelope A) contains three blue pages.^a In Envelope C, you will be asked to answer four questions to verify your understanding of the case facts provided on these three pages. You may receive up to ten (10) extra credit points based on your correct responses to these questions. You will not have access to Envelope A when you answer the questions in Envelope C. Therefore, please take your time and read the information carefully.**

You will need a pen or pencil. You will also be asked to indicate the time at various points during the study. Do not use any other materials, and do not discuss the study with another participant. Answer each question in the order presented, and to the best of your ability.

If you have any questions during the study, do not hesitate to ask me. However, I request that you do not discuss this study with your peers for approximately one month because they may be asked to participate in this study at a later date.

You may open Envelope A when instructed to do so and proceed with the case.

Thank you again for your participation in this study.

ENVELOPE A

INSTRUCTIONS

As you read the study information, try to experience the scenario described as vividly as possible by imagining what you would feel like and think about in your role and by imagining people you know as those in the scenario.

Assume you are the Chief Financial Officer (CFO) of Holt Semiconductor, Incorporated (Holt). Holt has an annual reporting period end date of December 31. It is now November 22, 2010. Based on the evidence presented in this envelope, you will be asked to assess whether Holt will continue to operate in the future at least, but not limited to, 12 months from the end of the reporting period. That is, you will need to evaluate whether Holt will continue to exist, rather than go out of business. Although you have made this assessment informally in the past, the Financial Accounting Standards Board recently issued an accounting standard that now *requires* management to formally assess the ability of its company to continue as a going concern.

DECISION OUTCOME ONLY CONDITION ALTERNATE

Specifically, you will be asked to indicate using a scale from 0 to 100, the likelihood that your company will continue to operate in the future. A score will be computed based on how closely your ASSESSED LIKELIHOOD that your company will continue to operate in the future approximates the assessed likelihood of experienced professionals. Similar to you, these professionals have also been asked to assume the role of one of Holt's C-Suite executives (e.g., CEO, COO). You will be evaluated based SOLELY on your assessed likelihood, NOT based on why and how you made your assessment. Furthermore, participants with the top scores will each be awarded a \$10 gift certificate.

At least 25% of participants have been randomly selected for a follow-up conference with a member of the Department of Accountancy Faculty (not your course instructor). The Faculty member will assume the role of a member of Holt's Board of Directors. If you were selected, you will receive feedback about your assessed likelihood from the Faculty member. You will be informed of any differences between your assessed likelihood and the experienced professionals' assessed likelihood. The follow-up conference will last approximately 5-10 minutes. You will find out if you were selected once you complete the written part of the study and turn in all materials. If selected, you will immediately go to another room for the conference. You must attend the follow-up conference to be eligible to receive extra credit. Please print your name, email address, and phone number in the space provided so that we can contact you if necessary.

DECISION PROCESS ONLY CONDITION ALTERNATE

Specifically, you will be asked to indicate the likelihood that your company will continue to operate in the future. A score will be computed based on how closely the REASONING behind your judgment of the likelihood that your company will continue to operate in the future approximates the reasoning of experienced professionals. Similar to you, these professionals have also been asked to assume the role of one of Holt's C-Suite executives (e.g., CEO, COO). You will be evaluated based SOLELY on your explanation of why and how you made your judgment, NOT based on your final assessed likelihood. Furthermore, participants with the top scores will each be awarded a \$10 gift certificate.

At least 25% of participants have been randomly selected for a follow-up conference with a member of the Department of Accountancy Faculty (not your course instructor). The Faculty member will assume the role of a member of Holt's Board of Directors. If you were selected, you will be asked to explain the reasoning behind your judgment. You will be asked to explain why and how you made your judgment. The follow-up conference will last approximately 15-20 minutes. You will find out if you were selected once you complete the written part of the study and turn in all materials. If selected, you will immediately go to another room for the conference. You must attend the follow-up conference to be eligible to receive extra credit. Please print your name, email address, and phone number in the space provided so that we can contact you if necessary.

BOTH DECISION OUTCOME AND DECISION PROCESS CONDITION ALTERNATE

Specifically, you will be asked to indicate using a scale from 0 to 100, the likelihood that your company will continue to operate in the future. A combined score will be computed based on **BOTH** 1) how closely your ASSESSED LIKELIHOOD that your company will continue to operate in the future approximates the assessed likelihood of experienced professionals, and 2) how closely the REASONING behind your judgment of the likelihood that your company will continue to operate in the future approximates the reasoning of the experienced professionals. Similar to you, these professionals have also been asked to assume the role of one of Holt's C-Suite executives (e.g., CEO, COO). You will be evaluated based BOTH on your assessed likelihood and on your explanation of why and how you made your judgment, EACH equally important in determining your combined score. Furthermore, participants with the top combined scores will each be awarded a \$10 gift certificate.

At least 25% of participants have been randomly selected for a follow-up conference with a member of the Department of Accountancy Faculty (not your course instructor). The Faculty member will assume the role of a member of Holt's Board of Directors. If you were selected, you will receive feedback about your assessed likelihood from the Faculty. You will be informed of any differences between your assessed likelihood and the experienced professionals' assessed likelihood. In addition, you will be asked to explain the reasoning behind your judgment to the Faculty member. You will be asked to explain why and how you made your judgment. The follow-up conference will last approximately 15-20 minutes. You will find out if you were selected once you complete the written part of the study and turn in all materials. If selected, you will immediately go to another room for the conference. You must attend the follow-up conference to be eligible to receive extra credit. Please print your name, email address, and phone number in the space provided so that we can contact you if necessary.

CONTROL CONDITION ALTERNATE

Your judgments will be totally confidential and only your responses to the four extra credit questions regarding case facts will be evaluated individually. Your responses to the remaining materials will be aggregated and averaged with the responses of others to determine general characteristics of judgment. You will not be contacted regarding your responses. Please do not identify yourself in any way on these materials.

Furthermore, participants will be randomly selected to receive a \$10 gift certificate each.

b

Name: _____

Email address: _____

Phone number: _____

HOLT SEMICONDUCTOR, INCORPORATED BACKGROUND INFORMATION

Holt Semiconductor, Incorporated

Holt, a publicly traded company, is a leader in the design and manufacture of semiconductors for the automotive, consumer, industrial, networking, and wireless markets. Semiconductors perform a broad variety of functions within electronic products and systems, such as processing data, storing information and converting or controlling signals. Holt has operated in the semiconductor industry for more than 50 years. The industry has changed significantly and Holt's many technological innovations have helped advance it.

Holt manufactures a substantial portion of its products at its own three manufacturing facilities. The manufacturing processes require many raw materials, such as silicon wafers, mold compound, packaging substrates and various chemicals and gases.

Holt's Founder

Holt Semiconductor, Inc. was founded by Lee Holt, affectionately called "Pop" by his employees and community and well-known for his big smile. Pop described the experience of starting and growing the company as "incredible...and nuts...and amazing. I totally loved it. It was a dream come true."

In addition to high quality products, Pop attributes Holt's success to valuing employees, customers, and community. Holt's work environment fosters cooperation, communication, and a sense of accomplishment for all employees. As a result, Holt's employees are extremely loyal. They have initiative and are both proud and excited about what they do. Many spend their entire careers at Holt. Employee loyalty and enthusiasm lead to exceptional customer service. Customers respect Holt not only for its product quality but also for its commitment to customer satisfaction. Promoting community, Pop based Holt's principal operations in his hometown of Boley, Texas. This brought new employment opportunities and helped to revitalize the local economy. Currently, Holt is the largest employer in Boley. Pop also supports his hometown and the larger community through various charitable endeavors.

Your Own Experience with Holt

You first started with Holt many years ago as a part-time summer employee while in high school. Pop noticed your hard work and enthusiasm. He became your mentor because of the potential he saw in you, even paying for your college education, including graduate school. However, Pop strongly encouraged you to explore other opportunities after graduation. Pop wanted you to live up to your potential—whatever that might be and wherever that might take you.

While in college, you would come back to help out at Holt during holidays and summer vacations, working in various departments and effectively learning the business from the bottom up. After completing your MBA, you worked in financial management at an electronics company while earning your CPA. Although you were grateful for that experience, you knew your heart and passion remained at Holt. You loved its challenge, creativity, and sense of family. Thus, after two years, you returned to Holt and to your community. Given your strong technical and managerial capabilities, your role in the company has grown over time, and now you are the CFO of Holt. You take pride in your job and in the fact that you were promoted from within the company to become CFO.

As CFO, you are now in charge of administrative, financial, and risk management operations. You maintain relationships with stockholders, financial institutions, and the investment community. You approve all reporting documents, including annual financial statements. You are also responsible for assessing Holt's ability to continue as a going concern, and base this assessment on your knowledge of relevant conditions and events.

HOLT SEMICONDUCTOR, INCORPORATED POTENTIAL ENVIRONMENTAL LIABILITY

Holt has always been in compliance with applicable environmental laws and regulations. However, you are now aware of a situation that may require recording a contingent liability³⁹ for estimated environmental contamination costs. This impacts your current assessment of Holt's ability to continue in operation.

Last February, you spoke with an employee from one of the company's manufacturing sites. He mentioned the discovery of an old underground tank field, comprised of three 10,000-gallon storage tanks. Holt installed the tanks which had once stored cleaning solvents and fuel used in manufacturing processes, but they have not been in use for many years. No one was sure if any of the tanks have leaked over the years. This is a concern, as the tanks are situated near an underground water source that feeds the water supply of nearby communities.

In order to determine if there has been any contamination to the surrounding soil and groundwater, and if so, estimate the related liability for environmental contamination costs, two sources have been separately collecting information and evaluating the situation since the tank field discovery. You hope the estimated contamination costs fall in the lower range of potential costs (e.g., costs estimated to be insignificant/minimal, inexpensive, or less costly) rather than the upper range of potential costs (e.g., costs estimated to be significant, expensive, or more costly). The higher the cost estimate, the more likely it is that Holt will need to seek additional financing to cover the potential environmental liability. Therefore, a significant liability would harm the company's business, financial condition, and results of operations.

All major items have been identified, and each source is ready to inform you of his respective findings. Based on their findings, you will need to determine the potential environmental liability's impact on the company's ability to continue in operation. You will also report the issue to the Environmental Protection Agency (EPA) within the next several weeks. The EPA is known to have a very rapid response to such issues, so you expect that any remaining uncertainties will be resolved in the following 4-8 months.

³⁹ A contingent liability is a potential obligation due to an existing situation that involves uncertainty as to its possible outcome and impact on a company. The uncertainty will ultimately be resolved when one or more future events occur.

HOLT SEMICONDUCTOR, INCORPORATED GOING CONCERN

Generally, a manager prefers to find that a company will continue to operate in the future.

In the past, there had never been any doubt that Holt would continue to operate in the future, and the company continues to perform well. As you think about making your current assessment of the likelihood that your company will continue in operation over at least the next 12 months, you know important company stakeholders prefer an assessment towards the high end of the likelihood scale.

However, you're concerned about the environmental liability's potential to move your assessment towards the low end of the scale and the negative implications this would have for employees and other company stakeholders.

For example, you hate to even think about this with the current economy, but hundreds of employees could lose their jobs. You're not immune to this either if the Board of Directors lacks confidence in you. Layoffs would hurt the morale of remaining employees, especially not knowing if they would be next to lose their jobs. In turn, this would affect productivity, innovation, loyalty, and eventually sales by impacting the great service customers have come to expect. If customers are unsure that the company will be around to stand behind its products, this could also affect the outcome of a bid Holt is currently making on a significant contract with a potential new customer. In addition, you are currently renegotiating a loan and hoping to obtain more favorable terms for Holt. However, lenders may be less willing to extend credit to Holt or only do so at higher interest rates to compensate for the perceived higher company risk. Suppliers may not even be willing to sell Holt anything on account—they might require cash on delivery. And, what about investors? Existing and potential investors would have lower confidence in the future prospects of Holt, decreasing their willingness to invest or maintain investments.

You're also worried that expressing uncertainty about Holt's ability to continue to operate may escalate what otherwise is a manageable problem into significant financial distress for the company. This escalation, rather than the environmental issue itself, could make going out of business more likely, a self-fulfilling prophecy. This would destroy the local community... and Pop's dream.

**HOLT SEMICONDUCTOR, INCORPORATED
GOING CONCERN**

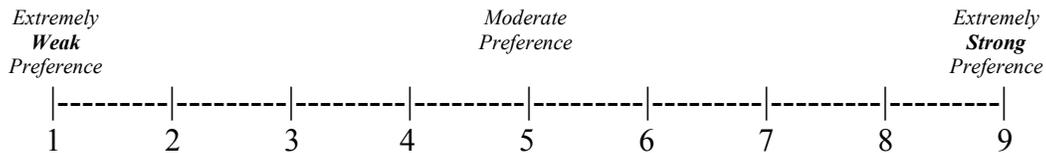
As the CFO of Holt, please list three reasons why you prefer to find that Holt will continue to operate in the future. List the reason you find most significant from the prior page discussion first. For the remaining two reasons, you can list additional significant reasons based on the prior page discussion or add your own reasons.

1. _____

2. _____

3. _____

As the CFO of Holt, how strong is your preference to find that Holt will continue to operate in the future? (Please indicate your response by placing an “x” on the scale provided below.)



REVIEW AND EVALUATION^c

DECISION OUTCOME ONLY CONDITION ALTERNATE

Your responses to the following information will be reviewed and evaluated based on how closely your **ASSESSED LIKELIHOOD** that your company will continue to operate in the future approximates the assessed likelihood of the other Holt C-suite executives. You will be evaluated based SOLELY on your assessed likelihood, NOT based on why and how you made your assessment.

Remember that, as Holt's CFO, you may be asked to meet with a member of Holt's Board of Directors. If so, you will receive feedback about your assessed likelihood from the board member. You will be informed of any differences between your assessed likelihood and the other executives' assessed likelihood. The meeting will last approximately 5-10 minutes.

DECISION PROCESS ONLY CONDITION ALTERNATE

Your responses to the following information will be reviewed and evaluated based on how closely the **REASONING** behind your judgment of the likelihood that your company will continue to operate in the future approximates the reasoning of the other Holt C-suite executives. You will be evaluated based SOLELY on your explanation of why and how you made your judgment, NOT based on your final assessed likelihood.

Remember that, as Holt's CFO, you may be asked to meet with a member of Holt's Board of Directors. If so, you will be asked to explain the reasoning behind your judgment to the board member. You will be asked to explain why and how you made your judgment. The meeting will last approximately 15-20 minutes.

BOTH DECISION OUTCOME AND DECISION PROCESS CONDITION ALTERNATE

Your responses to the following information will be reviewed and evaluated based on: 1) how closely your **ASSESSED LIKELIHOOD** that your company will continue to operate in the future approximates the assessed likelihood of the other Holt C-suite executives and 2) how closely the **REASONING** behind your judgment of the likelihood that your company will continue to operate in the future approximates the reasoning of the other Holt C-suite executives. You will be evaluated based BOTH on your assessed likelihood and on your explanation of why and how you made your judgment.

Remember that, as Holt's CFO, you may be asked to meet with a member of Holt's Board of Directors. If so, you will receive feedback about your assessed likelihood from the board member. You will be informed of any differences between your assessed likelihood and the other executives' assessed likelihood. In addition, you will be asked to explain the reasoning behind your judgment to the board member. You will be asked to explain why and how you made your judgment. The meeting will last approximately 15-20 minutes.

**HOLT SEMICONDUCTOR, INCORPORATED
EVIDENCE ITEMS^d**

Please read each evidence item on this page and the next carefully and consider its implications. Items are presented in random order; therefore, order does not provide any information about the importance of each item.

- Andrew indicates some of the underground storage tanks leaked. The leaked substance is a suspected carcinogen that has contaminated the surrounding soil and groundwater.
- Nick indicates he attended a public forum regarding environmental conservation issues. The forum was well-organized and informative.
- Andrew indicates a helpful overview of the general environmental cleanup process has been developed. This can be distributed to interested employees.
- Nick indicates a system to pump and treat the groundwater is needed. The common procedure for such groundwater cleanup is expensive.
- Andrew indicates the statutory authority for underground storage tank regulation is the Resource Conservation and Recovery Act. This can be accessed on the internet.
- Nick indicates that one tank did not completely leak and the remaining liquids must be removed. This process should be inexpensive because Holt already has the equipment required for the removal.

- Andrew indicates the underground storage tanks should be permanently taken out of service. This process will be expensive because the tanks will need to be removed from the ground.
- Nick indicates the underground water source that supplies nearby communities is a confined aquifer, situated below a strong barrier. There is only a remote chance the drinking water supply has been contaminated.
- Nick indicates his summary report will be completed shortly. The report is currently being finalized in word processing.
- Andrew indicates there was little governmental regulation of underground storage tanks when the tanks were installed. Therefore, any fines and penalties for related non-compliance with environmental laws will be minimal.
- Nick indicates no additional potential responsible parties that contributed to the leakage have been identified. The company most likely will be responsible for the entire cleanup costs.
- Andrew indicates a low cost emerging technology may be used for the soil cleanup effort. It is probable the Environmental Protection Agency will approve this approach given its promotion of improvements in remediation technology.

DECISION OUTCOME ONLY CONDITION ALTERNATE

REMEMBER you will be evaluated based SOLELY on your assessed likelihood, NOT based on why and how you made your assessment. As Holt's CFO, you may also be asked to meet with a member of Holt's Board of Directors. If so, you will receive feedback about your assessed likelihood from the board member.

DECISION PROCESS ONLY CONDITION ALTERNATE

REMEMBER you will be evaluated based SOLELY on your explanation of why and how you made your judgment, NOT based on your final assessed likelihood. As Holt's CFO, you may also be asked to meet with a member of Holt's Board of Directors. If so, you will be asked to explain the reasoning behind your judgment to the board member.

BOTH DECISION OUTCOME AND DECISION PROCESS CONDITION ALTERNATE

REMEMBER you will be evaluated based BOTH on your assessed likelihood and on your explanation of why and how you made your judgment. As Holt's CFO, you may also be asked to meet with a member of Holt's Board of Directors. If so, you will receive feedback about your assessed likelihood from the board member, and you will be asked to explain the reasoning behind your judgment to the board member.

CONTROL CONDITION ALTERNATE

REMEMBER your responses are totally confidential and will be aggregated and averaged with the responses of others. You will not be contacted regarding your responses.

**Please return this packet to Envelope A
and then open Envelope B. Envelope A and your consent form will
be collected by the attendant.**

ENVELOPE B

INSTRUCTIONS

On the following pages, please review the information and respond to the questions in the order presented.

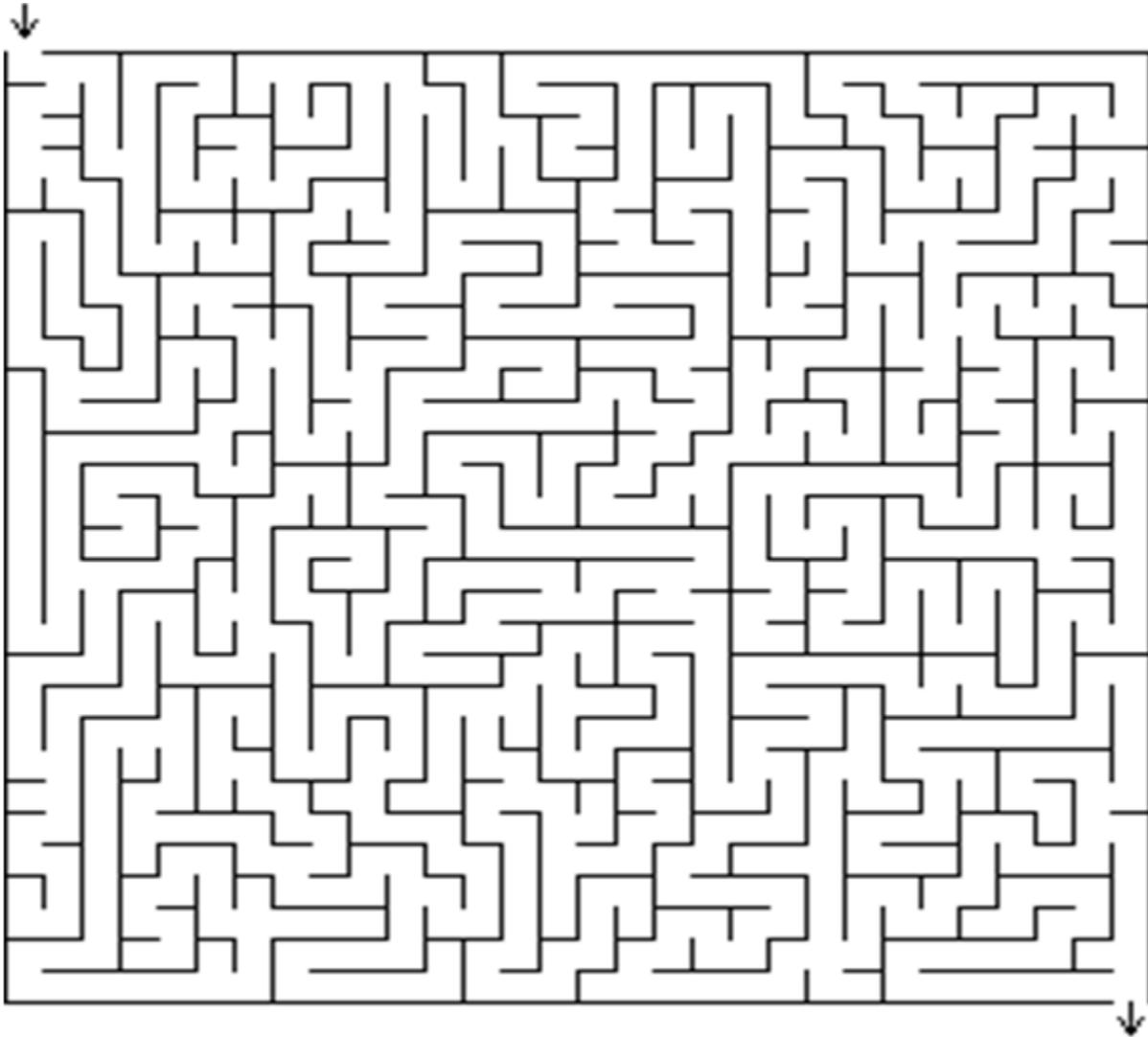
Please indicate your start time and end time in the spaces provided.

Start Time: _____

REFRESHER

Refresh and take a break by completing the maze below.

Take about 5 minutes to work on this task. If you cannot solve the maze within that time, move on to the next page. It is more important that you TRY to work through this exercise, not that you find the correct path.



Please indicate your end time in the space provided.

End Time: _____

HOLT SEMICONDUCTOR, INCORPORATED EVIDENCE INFORMATION REQUESTS

As CFO of Holt Semiconductor, Incorporated (Holt), you reviewed evidence relevant to assessing whether Holt will continue to operate in the future. This evidence was provided by two sources. Those two sources were as follows:

Nick Robinson (Environmental Engineer)

- Nick Robinson has over ten years experience in the environmental field, including experience in environmental risk, hazardous waste management, and environmental regulatory compliance. Nick has Bachelor's degree in Chemical Engineering and a Master's degree in Environmental Engineering. He is certified as a Hazardous Materials Specialist and as a Professional Engineer, and is a Certified Groundwater Professional. He has worked at a well-respected consulting firm for six years.

Andrew Lewis (Plant Engineer)

- Andrew Lewis has three years experience in maintenance and systems engineering, including experience in electronic control technology, waste heat recovery system, and various combustion and emission control systems. Andrew has a Bachelor's degree in Mechanical Engineering. He is a certified safety member with a Level 1 Basic Certification. He has worked at Holt for one year.

INSTRUCTIONS

Beginning on the next page are eighteen evidence items.^e Your task is twofold:

- (a) First, for each item, indicate whether it was previously provided by one of the two potential sources noted or is “new” – not recognized as being from the evidence items you reviewed in Envelope A.

For your reference, descriptions of the two potential sources are repeated at the bottom of each page.

- (b) Second, for each item, rate the degree of certainty you have in your response by placing an “x” on the scale provided. Your certainty rating should reflect how willing you would be to rely on your memory. If you would be willing to base your going concern assessment on what you remember having seen, you should indicate a high degree of certainty. If you would find it necessary to refer back to the evidence items to verify what you did or did not observe, you should indicate a low degree of certainty.

1a. No additional potential responsible parties that contributed to the leakage have been identified. The company most likely will be responsible for the entire cleanup costs.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

1b. How certain are you in your response?



2a. Attended a public forum regarding environmental conservation issues. The forum was well-organized and informative.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

2b. How certain are you in your response?



Nick Robinson (Environmental Engineer): a) over ten years experience in the environmental field, including experience in environmental risk, hazardous waste management, and environmental regulatory compliance; b) Bachelor's degree in Chemical Engineering and a Master's degree in Environmental Engineering; c) certified as a Hazardous Materials Specialist and as a Professional Engineer, and is a Certified Groundwater Professional; d) has worked at a well-respected consulting firm for six years

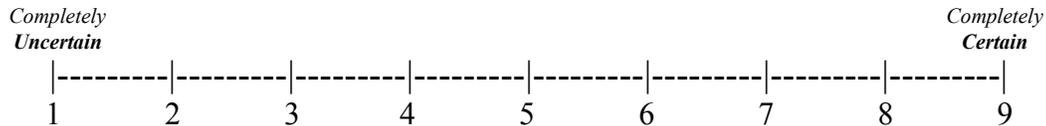
Andrew Lewis (Plant Engineer): a) three years experience in maintenance and systems engineering, including experience in electronic control technology, waste heat recovery system, and various combustion and emission control systems; b) Bachelor's degree in Mechanical Engineering; c) certified safety member with a Level 1 Basic Certification; d) has worked at Holt for one year

3a. Some of the machinery and equipment acquired for the remedial actions will have alternative uses in the company's normal operation. Therefore, the full cost of these items will not need to be included as part of the environmental cleanup cost.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

3b. How certain are you in your response?



4a. A helpful overview of the general environmental cleanup process has been developed. This can be distributed to interested employees.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

4b. How certain are you in your response?



Nick Robinson (Environmental Engineer): a) over ten years experience in the environmental field, including experience in environmental risk, hazardous waste management, and environmental regulatory compliance; b) Bachelor's degree in Chemical Engineering and a Master's degree in Environmental Engineering; c) certified as a Hazardous Materials Specialist and as a Professional Engineer, and is a Certified Groundwater Professional; d) has worked at a well-respected consulting firm for six years

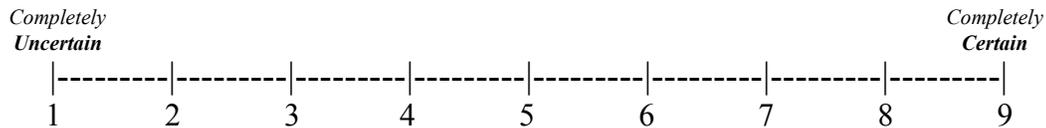
Andrew Lewis (Plant Engineer): a) three years experience in maintenance and systems engineering, including experience in electronic control technology, waste heat recovery system, and various combustion and emission control systems; b) Bachelor's degree in Mechanical Engineering; c) certified safety member with a Level 1 Basic Certification; d) has worked at Holt for one year

5a. The underground storage tanks should be permanently taken out of service. This process will be expensive because the tanks will need to be removed from the ground.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

5b. How certain are you in your response?

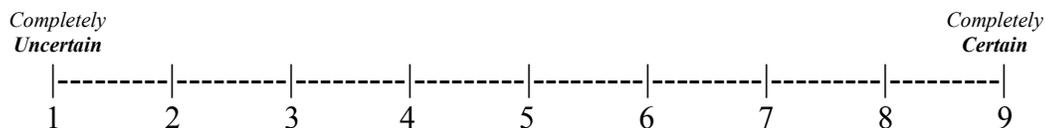


6a. A system to pump and treat the groundwater is needed. The common procedure for such groundwater cleanup is expensive.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

6b. How certain are you in your response?



Nick Robinson (Environmental Engineer): a) over ten years experience in the environmental field, including experience in environmental risk, hazardous waste management, and environmental regulatory compliance; b) Bachelor's degree in Chemical Engineering and a Master's degree in Environmental Engineering; c) certified as a Hazardous Materials Specialist and as a Professional Engineer, and is a Certified Groundwater Professional; d) has worked at a well-respected consulting firm for six years

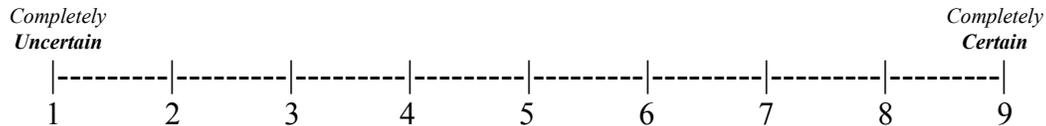
Andrew Lewis (Plant Engineer): a) three years experience in maintenance and systems engineering, including experience in electronic control technology, waste heat recovery system, and various combustion and emission control systems; b) Bachelor's degree in Mechanical Engineering; c) certified safety member with a Level 1 Basic Certification; d) has worked at Holt for one year

7a. A low cost emerging technology may be used for the soil cleanup effort. It is probable the Environmental Protection Agency will approve this approach given its promotion of improvements in remediation technology.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

7b. How certain are you in your response?

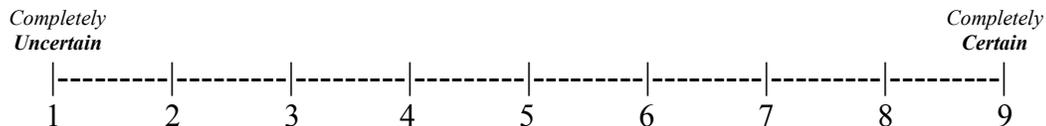


8a. Will attend a meeting with the board of directors. The meeting will be held next week.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

8b. How certain are you in your response?



Nick Robinson (Environmental Engineer): a) over ten years experience in the environmental field, including experience in environmental risk, hazardous waste management, and environmental regulatory compliance; b) Bachelor's degree in Chemical Engineering and a Master's degree in Environmental Engineering; c) certified as a Hazardous Materials Specialist and as a Professional Engineer, and is a Certified Groundwater Professional; d) has worked at a well-respected consulting firm for six years

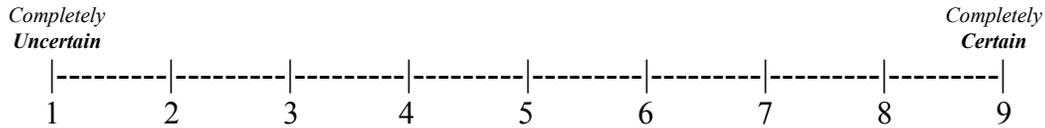
Andrew Lewis (Plant Engineer): a) three years experience in maintenance and systems engineering, including experience in electronic control technology, waste heat recovery system, and various combustion and emission control systems; b) Bachelor's degree in Mechanical Engineering; c) certified safety member with a Level 1 Basic Certification; d) has worked at Holt for one year

9a. One tank did not completely leak and the remaining liquids must be removed. This process should be inexpensive because Holt already has the equipment required for the removal.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

9b. How certain are you in your response?

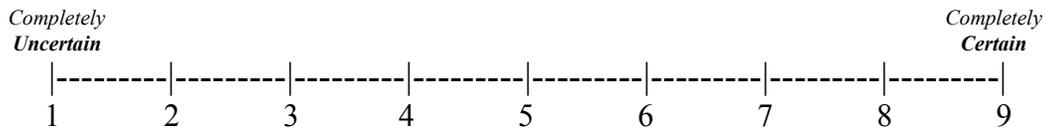


10a. There was little governmental regulation of underground storage tanks when the tanks were installed. Therefore, any fines and penalties for related non-compliance with environmental laws will be minimal.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

10b. How certain are you in your response?



Nick Robinson (Environmental Engineer): a) over ten years experience in the environmental field, including experience in environmental risk, hazardous waste management, and environmental regulatory compliance; b) Bachelor's degree in Chemical Engineering and a Master's degree in Environmental Engineering; c) certified as a Hazardous Materials Specialist and as a Professional Engineer, and is a Certified Groundwater Professional; d) has worked at a well-respected consulting firm for six years

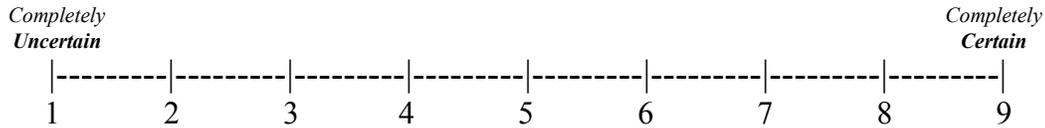
Andrew Lewis (Plant Engineer): a) three years experience in maintenance and systems engineering, including experience in electronic control technology, waste heat recovery system, and various combustion and emission control systems; b) Bachelor's degree in Mechanical Engineering; c) certified safety member with a Level 1 Basic Certification; d) has worked at Holt for one year

11a. Some of the underground storage tanks leaked. The leaked substance is a suspected carcinogen that has contaminated the surrounding soil and groundwater.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

11b. How certain are you in your response?

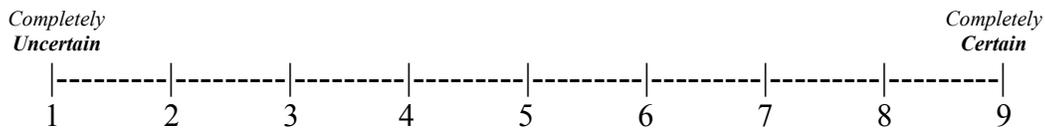


12a. The underground water source that supplies nearby communities is a confined aquifer, situated below a strong barrier. There is only a remote chance the drinking water supply has been contaminated.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

12b. How certain are you in your response?



Nick Robinson (Environmental Engineer): a) over ten years experience in the environmental field, including experience in environmental risk, hazardous waste management, and environmental regulatory compliance; b) Bachelor's degree in Chemical Engineering and a Master's degree in Environmental Engineering; c) certified as a Hazardous Materials Specialist and as a Professional Engineer, and is a Certified Groundwater Professional; d) has worked at a well-respected consulting firm for six years

Andrew Lewis (Plant Engineer): a) three years experience in maintenance and systems engineering, including experience in electronic control technology, waste heat recovery system, and various combustion and emission control systems; b) Bachelor's degree in Mechanical Engineering; c) certified safety member with a Level 1 Basic Certification; d) has worked at Holt for one year

13a. Departments are being reorganized. Therefore, some contact numbers may change.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

13b. How certain are you in your response?

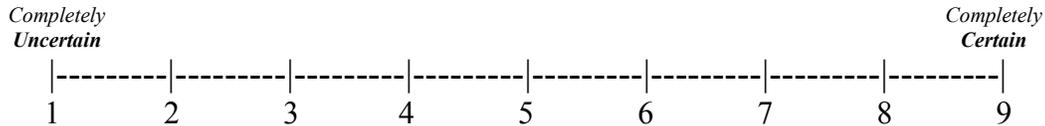


14a. The cleanup effort will be monitored. Compensation costs for technical experts to ensure the remedies put in place continue to be effective and operate properly will be significant.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

14b. How certain are you in your response?



Nick Robinson (Environmental Engineer): a) over ten years experience in the environmental field, including experience in environmental risk, hazardous waste management, and environmental regulatory compliance; b) Bachelor's degree in Chemical Engineering and a Master's degree in Environmental Engineering; c) certified as a Hazardous Materials Specialist and as a Professional Engineer, and is a Certified Groundwater Professional; d) has worked at a well-respected consulting firm for six years

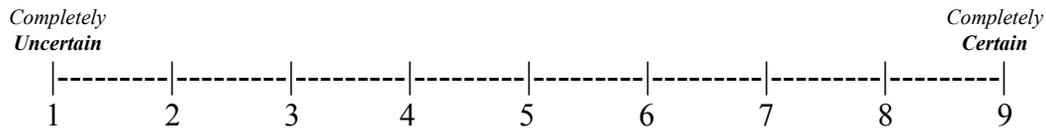
Andrew Lewis (Plant Engineer): a) three years experience in maintenance and systems engineering, including experience in electronic control technology, waste heat recovery system, and various combustion and emission control systems; b) Bachelor's degree in Mechanical Engineering; c) certified safety member with a Level 1 Basic Certification; d) has worked at Holt for one year

15a. The summary report will be completed shortly. The report is currently being finalized in word processing.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

15b. How certain are you in your response?



16a. The formal training program to ensure employees are familiar with proper waste handling and emergency procedures is adequate. Any additional training costs related to the cleanup effort will be minimal.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

16b. How certain are you in your response?



Nick Robinson (Environmental Engineer): a) over ten years experience in the environmental field, including experience in environmental risk, hazardous waste management, and environmental regulatory compliance; b) Bachelor's degree in Chemical Engineering and a Master's degree in Environmental Engineering; c) certified as a Hazardous Materials Specialist and as a Professional Engineer, and is a Certified Groundwater Professional; d) has worked at a well-respected consulting firm for six years

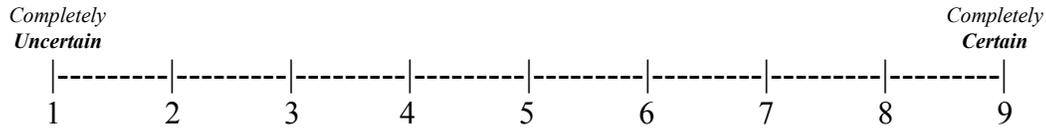
Andrew Lewis (Plant Engineer): a) three years experience in maintenance and systems engineering, including experience in electronic control technology, waste heat recovery system, and various combustion and emission control systems; b) Bachelor's degree in Mechanical Engineering; c) certified safety member with a Level 1 Basic Certification; d) has worked at Holt for one year

17a. The statutory authority for underground storage tank regulation is the Resource Conservation and Recovery Act. This can be accessed on the internet.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

17b. How certain are you in your response?

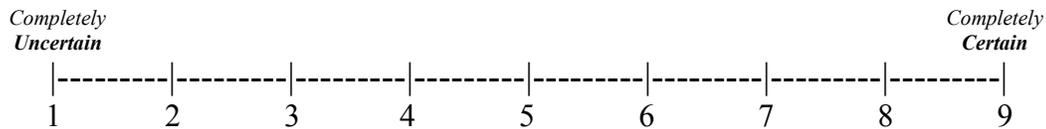


18a. It is likely the leaked substance discharged into an isolated valley lake. Related cleanup costs for this natural resource damage will be expensive.

This statement (*check one*):

- was provided by Nick Robinson, the Environmental Engineer
- was provided by Andrew Lewis, the Plant Engineer
- is new

18b. How certain are you in your response?



Nick Robinson (Environmental Engineer): a) over ten years experience in the environmental field, including experience in environmental risk, hazardous waste management, and environmental regulatory compliance; b) Bachelor's degree in Chemical Engineering and a Master's degree in Environmental Engineering; c) certified as a Hazardous Materials Specialist and as a Professional Engineer, and is a Certified Groundwater Professional; d) has worked at a well-respected consulting firm for six years

Andrew Lewis (Plant Engineer): a) three years experience in maintenance and systems engineering, including experience in electronic control technology, waste heat recovery system, and various combustion and emission control systems; b) Bachelor's degree in Mechanical Engineering; c) certified safety member with a Level 1 Basic Certification; d) has worked at Holt for one year

Please indicate your end time in the space provided.

End Time: _____

**Please return this packet to Envelope B
and then open Envelope C.**

ENVELOPE C

INSTRUCTIONS

On the following pages, please review the information and respond to the questions in the order presented. Please do not look forward or refer back to the information and change your responses.

SOURCE COMPARISON

You received evidence (in Envelope A) from two different sources— Nick Robinson (Environmental Engineer) and Andrew Lewis (Plant Engineer). Please answer the following question based on the descriptions of the two sources you read.

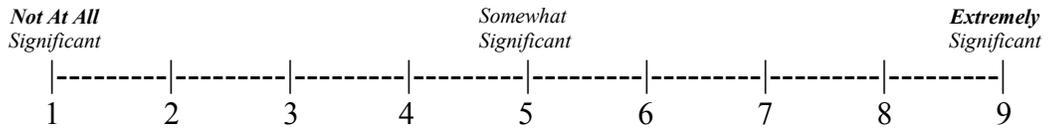
In your opinion, how knowledgeable is Nick compared to Andrew in providing evidence to evaluate the extent to which a potential environmental liability exists? (Please indicate your response by placing an “x” on the scale provided below.)



ENVIRONMENTAL ISSUE

Please answer the following questions based on the evidence you evaluated in Envelope A.

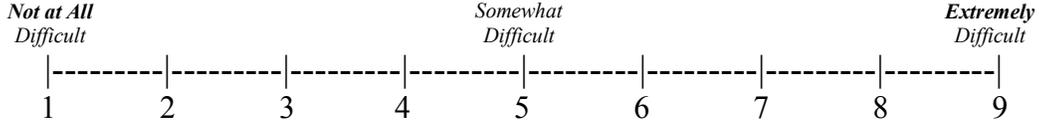
In your opinion, how significant is the likely financial impact of the environmental issue on Holt Semiconductors, Incorporated? (Please indicate your response by placing an “x” on the scale provided below.)



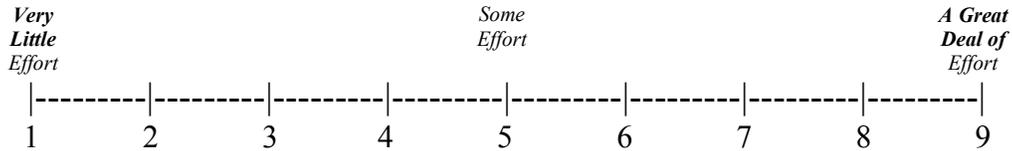
FOLLOW-UP QUESTIONS

For this section, please indicate your response by placing an “x” on the scale provided below each question.

1. How difficult did you find the review of evidence items and the going concern assessment?



2. How much effort did you expend on these tasks?



3. How motivated were you to:

(a) determine a correct final going concern likelihood?



(b) make a going concern judgment that you felt you could explain well?



4. To what extent did you feel that you would be evaluated on:

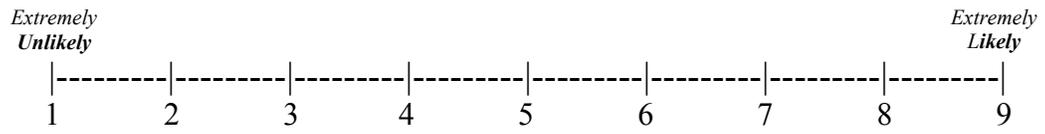
(a) your assessed likelihood?



(b) your explanation of why and how you made your judgment?



5. How likely do you think it is that you were selected to meet about your responses to this study?



The following four questions (#6 - #9) relate to case information you reviewed on the blue pages in Envelope A. You may receive up to ten (10) extra credit points based on your correct responses to these questions.

6. Do managers generally have a preference for a going concern assessment for their companies?
- No.
 - Yes. A manager prefers to find that (*check one*):
 - a company will continue to operate in the future.
 - a company will not continue to operate in the future.
7. Did the instructions to the study inform you that you may have been selected for a follow-up conference with a member of the Department Faculty who would assume the role of a member of Holt's Board of Directors?
- No
 - Yes
8. Other than the valuation of the four extra credit questions, did the instructions to the study inform you that your responses would be evaluated and scored based on specific criteria?
- No.
 - Yes. The instructions indicated that (*check one, please read each option carefully*):
 - A score would be computed based on how closely my ASSESSED LIKELIHOOD that my company would continue to operate in the future approximates the assessed likelihood of experienced professionals.
 - A score would be computed based on how closely the REASONING behind my judgment of the likelihood that my company would continue to operate in the future approximates the reasoning of experienced professionals.
 - A combined score would be computed based on both: 1) how closely my ASSESSED LIKELIHOOD that my company would continue to operate in the future approximates the assessed likelihood of experienced professionals and 2) how closely the REASONING behind my judgment of the likelihood that my company would continue to operate in the future approximates the reasoning of experienced professionals.

9. Did the instructions inform you of a potential additional prize?

- No.
- Yes. The instructions indicated that (*check one, please read each option carefully*):
 - Participants would be randomly selected to receive a \$10 gift certificate each.
 - A score would be computed based on how closely your **ASSESSED LIKELIHOOD** approximates the assessed likelihood of experienced professionals. Participants with the top scores would each receive a \$10 gift certificate.
 - A score would be computed based on how closely the **REASONING behind your likelihood judgment** approximates the reasoning of experienced professionals. Participants with the top scores would each receive a \$10 gift certificate.
 - Two scores would be computed: 1) a score based on how closely your **ASSESSED LIKELIHOOD** approximates the assessed likelihood of experienced professionals and 2) a score based on how closely the **REASONING behind your likelihood judgment** approximates the reasoning of experienced professionals. Participants with the top combined scores would each receive a \$10 gift certificate.

DEMOGRAPHIC QUESTIONS

Please take a moment to describe yourself and your experience.

1. What is your major?

- Accounting
- Finance
- Economics
- Other—please describe: _____

2. What is your current academic year?

- Freshman
- Sophomore
- Junior
- Senior
- Other—please describe: _____

3. Approximately **how many** of the following courses have you taken?
(Include both courses completed and courses in progress.)

	<u>Zero</u>	<u>One</u>	<u>Two</u>	<u>Other</u> <i>(fill in the blank)</i>
Introductory accounting (e.g., 201, 202)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Financial accounting (e.g., 301, 303)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Managerial accounting (e.g., 302, 304)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Auditing/assurance (e.g., 405)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
Finance.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____

4. Do you plan to become a Certified Public Accountant (CPA)?

- No
 Yes

5. How much **auditing**-related work experience do you have? _____ years, _____ months
In a short descriptive phrase, please describe any **auditing**-related work experience.

6. How much **other accounting**-related work experience do you have? _____ years, _____ months
In a short descriptive phrase, please describe any **other accounting**-related work experience.

7. In a short descriptive phrase, please describe any other primary work experience you have.

8. What is your gender?

Male

Female

THANK YOU FOR PARTICIPATING IN THIS STUDY!
Please return this packet to Envelope C, then clip the remaining two envelopes together and return them to the attendant.

-
- a The three blue pages are the pages with the following headings: 1) INSTRUCTIONS (see pages 69-71), 2) HOLT SEMICONDUCTOR, INCORPORATED GOING CONCERN (see page 74), and 3) REVIEW AND EVALUATION (see page 76). For the control condition, general instructions indicate “two” blue pages, excluding item 3).
- b Below request for contact information is omitted in control condition.
- c This page is omitted in the control condition.
- d The order of the evidence items is restricted such that one source does not provide more than two evidence items before the other source provides an evidence item.
- e The order of the evidence items includes the following restrictions: 1) no more than two statements of the same evidence type are presented successively, 2) no more than three statements from any one source are presented successively, and 3) the first and last statements on the initial evidence list are not also the first and last statements on the source recognition test.
- f Reasoning request omitted in decision outcome only condition and control condition.

APPENDIX D: H1 AND H2 DESCRIPTIVE TABLE
H1 Proportion of Source Attributions By Actual and Identified Source Reliability
H2 Count of Source Attributions By Actual and Identified Source Reliability

Panel A: Mean (standard deviation) proportions and mean (standard deviation) counts for DECISION OUTCOME condition

Preference-Consistency	Actual Source Reliability												Overall
	More				Less				New				
	Identified Source Reliability			Overall	Identified Source Reliability			Overall	Identified Source Reliability			Overall	
More	Less	New	More		Less	New	More		Less	New			
Preference-Consistent	0.714 (0.378)	0.250 (0.325)	0.035 (0.134)	1.000 (0.000)	0.250 (0.325)	0.679 (0.317)	0.071 (0.182)	1.000 (0.000)	0.071 (0.181)	0.036 (0.134)	0.893 (0.289)	1.000 (0.000)	0.333 (0.000)
	c = 1.429 (0.756)	c = 0.500 (0.650)	c = 0.071 (0.267)	c = 2.000 (0.000)	c = 0.500 (0.650)	c = 1.357 (0.633)	c = 0.143 (0.363)	c = 2.000 (0.000)	c = 0.143 (0.363)	c = 0.071 (0.267)	c = 1.786 (0.579)	c = 2.000 (0.000)	c = 6.000 (0.000)
Preference-Inconsistent	0.679 (0.317)	0.214 (0.257)	0.107 (0.213)	1.000 (0.000)	0.179 (0.249)	0.643 (0.363)	0.179 (0.249)	1.000 (0.000)	0.036 (0.134)	0.036 (0.134)	0.929 (0.182)	1.000 (0.000)	0.333 (0.000)
	c = 1.357 (0.633)	c = 0.429 (0.514)	c = 0.214 (0.426)	c = 2.000 (0.000)	c = 0.357 (0.497)	c = 1.286 (0.726)	c = 0.357 (0.497)	c = 2.000 (0.000)	c = 0.071 (0.267)	c = 0.071 (0.267)	c = 1.857 (0.363)	c = 2.000 (0.000)	c = 6.000 (0.000)
Neutral	0.679 (0.317)	0.321 (0.317)	0.000 (0.000)	1.000 (0.000)	0.214 (0.378)	0.750 (0.38)	0.036 (0.134)	1.000 (0.000)	0.036 (0.134)	0.000 (0.000)	0.964 (0.134)	1.000 (0.000)	0.333 (0.000)
	c = 1.357 (0.633)	c = 0.643 (0.633)	c = 0.000 (0.000)	c = 2.000 (0.000)	c = 0.429 (0.756)	c = 1.500 (0.780)	c = 0.071 (0.267)	c = 2.000 (0.000)	c = 0.071 (0.267)	c = 0.000 (0.000)	c = 1.929 (0.267)	c = 2.000 (0.000)	c = 6.000 (0.000)
Overall	0.690 (0.205)	0.262 (0.193)	0.048 (0.078)		0.214 (0.221)	0.690 (0.225)	0.095 (0.086)		0.048 (0.102)	0.024 (0.061)	0.929 (0.126)		1.000 (0.000)
	c = 4.143 (1.231)	c = 1.571 (1.158)	c = 0.286 (0.469)		c = 1.286 (1.326)	c = 4.143 (1.351)	c = 0.571 (0.514)		c = 0.286 (0.286)	c = 0.143 (0.363)	c = 5.571 (0.756)		c = 18.000 (0.000)

Panel B: Mean (standard deviation) proportions and mean (standard deviation) counts for DECISION PROCESS condition

	<u>Actual Source Reliability</u>												Overall
	More				Less				New				
	<u>Identified Source Reliability</u>				<u>Identified Source Reliability</u>				<u>Identified Source Reliability</u>				
<u>Preference-Consistency</u>	More	Less	New	Overall	More	Less	New	Overall	More	Less	New	Overall	
Preference-Consistent	^a 0.857 (0.234)	0.143 (0.234)	0.000 (0.000)	1.000 (0.000)	0.071 (0.182)	^a 0.929 (0.182)	0.000 (0.000)	1.000 (0.000)	0.036 (0.134)	0.143 (0.306)	0.821 (0.372)	1.000 (0.000)	0.333 (0.000)
	c=1.714 (0.469)	c=0.286 (0.469)	c=0.000 (0.000)	c=2.000 (0.000)	c=0.143 (0.363)	c=1.857 (0.363)	c=0.000 (0.000)	c=2.000 (0.000)	c=0.071 (0.267)	c=0.286 (0.611)	c=1.643 (0.745)	c=2.000 (0.000)	c=6.000 (0.000)
Preference-Inconsistent	^a 0.893 (0.213)	107.000 (0.213)	0.000 (0.000)	1.000 (0.000)	0.179 (0.317)	^a 0.750 (0.380)	0.071 (0.182)	1.000 (0.000)	0.071 (0.182)	0.071 (0.182)	0.857 (0.363)	1.000 (0.000)	0.333 (0.000)
	c=1.786 (0.426)	c=0.214 (0.426)	c=0.000 (0.000)	c=2.000 (0.000)	c=0.357 (0.633)	c=1.500 (0.760)	c=0.143 (0.363)	c=2.000 (0.000)	c=0.143 (0.363)	c=0.143 (0.363)	c=1.714 (0.726)	c=2.000 (0.000)	c=6.000 (0.000)
Neutral	0.821 (0.317)	0.179 (0.317)	0.000 (0.000)	1.000 (0.000)	0.107 (0.289)	0.857 (0.306)	0.036 (0.134)	1.000 (0.000)	0.071 (0.267)	0.071 (0.267)	0.857 (0.363)	1.000 (0.000)	0.333 (0.000)
	c=1.643 (0.633)	c=0.357 (0.633)	c=0.000 (0.000)	c=2.000 (0.000)	c=0.214 (0.579)	c=1.714 (0.611)	c=0.071 (0.267)	c=2.000 (0.000)	c=0.143 (0.535)	c=0.143 (0.535)	c=1.714 (0.726)	c=2.000 (0.000)	c=6.000 (0.000)
Overall	0.857 (0.183)	0.143 (0.183)	0.000 (0.000)		0.119 (0.166)	0.845 (0.179)	0.036 (0.071)		0.060 (0.180)	0.095 (0.233)	0.845 (0.361)		1.000 (0.000)
	c=5.143 (1.099)	c=0.857 (1.099)	c=0.000 (0.000)		c=0.714 (0.994)	c=5.071 (1.072)	c=0.214 (0.426)		c=0.357 (1.082)	c=0.571 (1.399)	c=5.071 (2.165)		c=18.000 (0.000)

Panel C: Mean (standard deviation) proportions and mean (standard deviation) counts for BOTH DECISION OUTCOME AND DECISION PROCESS condition

Preference-Consistency	Actual Source Reliability												Overall
	More				Less				New				
	Identified Source Reliability				Identified Source Reliability				Identified Source Reliability				
	More	Less	New	Overall	More	Less	New	Overall	More	Less	New	Overall	
Preference-Consistent	0.833 (0.243)	0.111 (0.214)	0.056 (0.162)	1.000 (0.000)	0.278 (0.352)	0.639 (0.413)	0.083 (0.257)	1.000 (0.000)	0.083 (0.192)	0.028 (0.118)	0.889 (0.214)	1.000 (0.000)	0.333 (0.000)
	c = 1.667 (0.485)	c = 0.222 (0.428)	c = 0.111 (0.323)	c = 2.000 (0.000)	c = 0.556 (0.705)	c = 1.278 (0.826)	c = 0.167 (0.514)	c = 2.000 (0.000)	c = 0.167 (0.383)	c = 0.056 (0.236)	c = 1.778 (0.428)	c = 2.000 (0.000)	c = 6.000 (0.000)
Preference-Inconsistent	0.778 (0.352)	0.222 (0.352)	0.000 (0.000)	1.000 (0.000)	0.250 (0.257)	0.722 (0.308)	0.028 (0.118)	1.000 (0.000)	0.028 (0.118)	0.056 (0.162)	0.917 (0.192)	1.000 (0.000)	0.333 (0.000)
	c = 1.556 (0.705)	c = 0.444 (0.705)	c = 0.000 (0.000)	c = 2.000 (0.000)	c = 0.500 (0.514)	c = 1.444 (0.616)	c = 0.056 (0.236)	c = 2.000 (0.000)	c = 0.056 (0.236)	c = 0.111 (0.323)	c = 1.833 (0.383)	c = 2.000 (0.000)	c = 6.000 (0.000)
Neutral	0.861 (0.287)	0.139 (0.287)	0.000 (0.000)	1.000 (0.000)	0.083 (0.192)	0.889 (0.214)	0.028 (0.118)	1.000 (0.000)	0.083 (0.192)	0.000 (0.000)	0.917 (0.192)	1.000 (0.000)	0.333 (0.000)
	c = 1.722 (0.575)	c = 0.278 (0.575)	c = 0.000 (0.000)	c = 2.000 (0.000)	c = 0.167 (0.383)	c = 1.778 (0.428)	c = 0.056 (0.236)	c = 2.000 (0.000)	c = 0.167 (0.383)	c = 0.000 (0.000)	c = 1.833 (0.383)	c = 2.000 (0.000)	c = 6.000 (0.000)
Overall	0.824 (0.166)	0.157 (0.166)	0.019 (0.054)		0.204 (0.167)	0.750 (0.192)	0.046 (0.112)		0.065 (0.116)	0.028 (0.064)	0.907 (0.131)		1.000 (0.000)
	c = 4.944 (0.998)	c = 0.944 (0.998)	c = 0.111 (0.323)		c = 1.222 (1.003)	c = 4.500 (1.150)	c = 0.278 (0.669)		c = 0.389 (0.698)	c = 0.167 (0.383)	c = 5.444 (0.784)		c = 18.000 (0.000)

Neutral evidence items are presented here for completeness. However, as noted in footnote 17, neutral evidence items are not used to examine the formal hypotheses and research questions.

In source monitoring research, source memory accuracy is commonly determined based on the proportion of questions correctly identified as old that are then attributed to the correct source. Therefore, I follow this prior research and exclude new evidence items from the determination of source attribution accuracy.

c = count (number) of questions answered in a specific category, as follows:

For inside detail cells, count of questions answered in the preference-consistency by actual source reliability by identified source reliability category

For inside overall row total cells, count of questions answered in the preference-consistency by actual source reliability category

For outside overall row total cells, count of questions answered in the preference-consistency category

For outside overall column total cells, count of questions answered in the actual source reliability by identified source reliability category

Proportion of source attributions = c / number of evidence items actually provided by source in the specific category, as follows:

For inside detail cells and inside overall row total cells: = $c / 2$ (as each source provides 2 evidence items, within each preference-consistency evidence type)

For outside overall row total cells: = $c / 18$ (as together all three sources provide 18 evidence items, across all preference-consistency evidence types)

For outside overall column total cells: = $c / 6$ (as each source provides 6 evidence items, across all preference-consistency evidence types)

^a Within each Panel above, the average of superscript "a" numbers ties to Table 2, Panel A source attribution accuracy as follows:

For the decision outcome condition: $(0.714 + 0.679 + 0.679 + 0.643) / 4 = 0.679$

For the decision process condition: $(0.857 + 0.929 + 0.893 + 0.750) / 4 = 0.857$

For the both decision outcome and decision process condition: $(0.833 + 0.639 + 0.778 + 0.722) / 4 = 0.743$

^x Within each Panel above, the sum of superscript "x" numbers ties to Table 3, Panel A Score Preference-Consistent (H2a) as follows:

For the decision outcome condition: $0.500 + 0.143 = 0.643$

For the decision process condition: $0.143 + 0.071 = 0.214$

For the both decision outcome and decision process condition: $0.556 + 0.167 = 0.723$

^y Within each Panel above, the sum of superscript "y" numbers ties to Table 3, Panel A Score Preference-Inconsistent (H2b) as follows:

For the decision outcome condition: $0.429 + 0.214 = 0.643$

For the decision process condition: $0.214 + 0.000 = 0.214$

For the both decision outcome and decision process condition: $0.444 + 0.000 = 0.444$

APPENDIX E: H3 DESCRIPTIVE TABLE
H3 Mean Confidence in Source Attributions By Actual and Identified Source Reliability

Panel A: Mean confidence for DECISION OUTCOME condition

<u>Preference-Consistency</u>	<u>Actual Source Reliability</u>												Overall
	More			Less				New			Overall		
	<u>Identified Source Reliability</u>			<u>Identified Source Reliability</u>				<u>Identified Source Reliability</u>					
More	Less	New	Overall	More	Less	New	Overall	More	Less	New	Overall		
Preference-Consistent	^p 7.375 i = 8	^y 5.500 i = 4	- i = 0	6.750 i = 12	^x 6.500 i = 4	^z 7.429 i = 7	8.000 i = 1	7.167 i = 12	^x 6.000 i = 2	^y 5.000 i = 1	8.000 i = 9	6.917 i = 12	6.945 i = 36
Preference-Inconsistent	^p 6.750 i = 8	^x 6.333 i = 3	6.000 i = 1	6.583 i = 12	^y 6.667 i = 3	^z 7.833 i = 6	5.700 i = 3	7.008 i = 12	^y 2.000 i = 1	^x - i = 0	6.818 i = 11	6.417 i = 12	6.669 i = 36
Neutral	7.800 i = 10	7.000 i = 2	- i = 0	7.667 i = 12	7.250 i = 4	7.875 i = 8	- i = 0	7.667 i = 12	- i = 0	- i = 0	8.417 i = 12	8.417 i = 12	7.917 i = 36
Overall	7.346 i = 26	6.111 i = 9	6.000 i = 1		6.818 i = 11	7.714 i = 21	6.275 i = 4		4.667 i = 3	5.000 i = 1	7.750 i = 32		7.177 i = 108

Panel B: Mean confidence for DECISION PROCESS condition

<u>Preference-Consistency</u>	<u>Actual Source Reliability</u>												Overall
	More			Less				New			Overall		
	<u>Identified Source Reliability</u>			<u>Identified Source Reliability</u>				<u>Identified Source Reliability</u>					
More	Less	New	Overall	More	Less	New	Overall	More	Less	New	Overall		
Preference-Consistent	^p 6.980 i = 5	^y 7.000 i = 3	- i = 0	6.988 i = 8	^x 6.500 i = 2	^z 7.167 i = 6	- i = 0	7.000 i = 8	^x 8.000 i = 1	^y 5.700 i = 3	7.250 i = 4	6.763 i = 8	6.917 i = 24
Preference-Inconsistent	^p 7.317 i = 6	^x 6.500 i = 2	- i = 0	7.113 i = 8	^y 6.667 i = 3	^z 5.640 i = 5	- i = 0	6.025 i = 8	^y 7.000 i = 2	^x 5.500 i = 2	7.250 i = 4	6.750 i = 8	6.629 i = 24
Neutral	6.980 i = 5	7.267 i = 3	- i = 0	7.088 i = 8	7.550 i = 2	6.780 i = 5	8.000 i = 1	7.125 i = 8	7.050 i = 2	4.000 i = 2	7.000 i = 4	6.263 i = 8	6.825 i = 24
Overall	7.106 i = 16	6.975 i = 8	- i = 0		6.872 i = 7	6.569 i = 16	8.000 i = 1		7.220 i = 5	5.157 i = 7	7.167 i = 12		6.790 i = 72

Panel C: Mean confidence for BOTH DECISION OUTCOME AND DECISION PROCESS condition

Preference-Consistency	Actual Source Reliability												Overall
	More				Less				New				
	Identified Source Reliability				Identified Source Reliability				Identified Source Reliability				
	More	Less	New	Overall	More	Less	New	Overall	More	Less	New	Overall	
Preference-Consistent	^a 7.206 i = 16	^y 6.675 i = 4	5.000 i = 2	6.909 i = 22	^x 6.230 i = 10	^y 7.600 i = 11	9.000 i = 1	7.041 i = 22	^x 6.000 i = 2	^y 5.500 i = 1	6.663 i = 19	6.277 i = 22	6.742 i = 66
Preference-Inconsistent	^a 7.494 i = 16	^x 6.583 i = 6	- i = 0	7.246 i = 22	^y 5.686 i = 7	^a 7.757 i = 14	2.000 i = 1	6.836 i = 22	^y 7.000 i = 1	^x 2.500 i = 2	6.779 i = 19	6.400 i = 22	6.827 i = 66
Neutral	7.806 i = 18	5.125 i = 4	- i = 0	7.319 i = 22	5.000 i = 2	7.895 i = 19	2.000 i = 1	7.364 i = 22	6.600 i = 2	- i = 0	6.730 i = 20	6.718 i = 22	7.134 i = 66
Overall	7.514 i = 50	6.193 i = 14	5.000 i = 2		5.900 i = 19	7.777 i = 44	4.333 i = 3		6.440 i = 5	3.500 i = 3	6.724 i = 58		6.901 i = 198

Neutral evidence items are presented here for completeness. However, as noted in footnote 17, neutral evidence items are not used to examine the formal hypotheses and research questions.

i = total number of items (responses) that fall into a specific category, as follows:

- For inside detail cells, total number of items in the preference-consistency by actual source reliability by identified source
- For inside overall row total cells, total number of items in the preference-consistency by actual source reliability category
- For outside overall row total cells, total number of items in the preference-consistency category
- For outside overall column total cells, total number of items in the actual source reliability by identified source reliability category

Mean confidence equals the sum of the confidence ratings divided by the corresponding total number of items (responses) that fall into a specific cell category.

The data presented in Table 4, Panel A are effectively weighted averages for each individual participant based on the number of responses across multiple cells of this appendix. Therefore, it is not possible to tie back to Table 4 based on the means presented here. However, within each Panel above, the cells involved in calculating the mean individual confidence assessments presented in Table 4, Panel A are as follows:

- ^a For accurate source attributions confidence preference-consistent, see superscript "a"
- ^b For accurate source attributions confidence preference-inconsistent, see superscript "b"
- ^x For inaccurate source attributions confidence preference-consistent, see superscript "x"
- ^y For inaccurate source attributions confidence preference-inconsistent, see superscript "y"

Also, see example computation in Appendix G, Panel A for confidence in accurate preference-consistent source attributions for a participant in the decision process condition.

APPENDIX F: H4 DESCRIPTIVE TABLE
H4 Confidence Calibration By Actual and Identified Source Reliability

Panel A: Mean (standard deviation) calibration for DECISION OUTCOME condition

Preference-Consistency	Actual Source Reliability											
	More			Overall	Less			Overall	New			Overall
	<u>Identified Source Reliability</u>				<u>Identified Source Reliability</u>				<u>Identified Source Reliability</u>			
More	Less	New	More	Less	New	More	Less	New				
Preference-Consistent	^a 0.094 (0.111) c = -1.429	^a 0.399 (0.230) c = -0.500	^a 0.456 (0.062) c = -0.071	c = 2.000	^a 0.475 (0.122) c = -0.500	^a 0.086 (0.109) c = -1.357	^a 0.766 (0.000) c = -0.143	c = 2.000	0.456 (0.000) c = 0.143	0.250 - c = 0.071	0.098 (0.158) c = 1.786	c = 2.000
Preference-Inconsistent	^a 0.129 (0.131) c = -1.357	^a 0.404 (0.172) c = -0.429	^a 0.491 (0.062) c = -0.214	c = 2.000	^a 0.560 (0.127) c = -0.357	^a 0.860 (0.078) c = -1.286	^a 0.316 (0.235) c = -0.357	c = 2.000	0.016 - c = 0.071	0.250 - c = 0.071	0.097 (0.149) c = 1.857	c = 2.000
Neutral	0.037 (0.058) c = 1.357	0.580 (0.123) c = 0.643	- - c = 0.000	c = 2.000	0.573 (0.170) c = 0.429	0.067 (0.158) c = 1.500	0.456 - c = 0.071	c = 2.000	0.063 - c = 0.071	- - c = 0.000	0.045 (0.068) c = 1.929	c = 2.000

Panel B: Mean (standard deviation) calibration for DECISION PROCESS condition

Preference-Consistency	Actual Source Reliability											
	More			Overall	Less			Overall	New			Overall
	<u>Identified Source Reliability</u>				<u>Identified Source Reliability</u>				<u>Identified Source Reliability</u>			
More	Less	New	More	Less	New	More	Less	New				
Preference-Consistent	^a 0.042 (0.064) c = -1.714	^a 0.426 (0.273) c = -0.286	^a - - c = -0.000	c = 2.000	^a 0.509 (0.076) c = -0.143	^a 0.063 (0.084) c = -1.857	^a - - c = -0.000	c = 2.000	0.766 - c = 0.071	0.474 (0.153) c = 0.286	0.042 (0.070) c = 1.643	c = 2.000
Preference-Inconsistent	^a 0.102 (0.138) c = -1.786	^a 0.594 (0.157) c = -0.214	^a - - c = -0.000	c = 2.000	^a 0.496 (0.051) c = -0.357	^a 0.138 (0.147) c = -1.500	^a 0.406 (0.221) c = -0.143	c = 2.000	0.563 - c = 0.143	0.414 (0.497) c = 0.143	0.035 (0.083) c = 1.714	c = 2.000
Neutral	0.057 (0.081) c = 1.643	0.430 (0.244) c = 0.357	- - c = 0.000	c = 2.000	0.613 (0.072) c = 0.214	0.054 (0.112) c = 1.714	0.766 - c = 0.071	c = 2.000	0.563 - c = 0.143	0.156 - c = 0.143	0.031 (0.071) c = 1.714	c = 2.000

Panel C: Mean (standard deviation) calibration for BOTH DECISION OUTCOME AND DECISION PROCESS condition

Preference-Consistency	Actual Source Reliability											
	More				Less				New			
	Identified Source Reliability			Overall	Identified Source Reliability			Overall	Identified Source Reliability			Overall
More	Less	New	More		Less	New	More		Less	New		
Preference-Consistent	^a 0.058 (0.062) c = 1.667	^a 0.567 (0.316) c = 0.222	^a 0.25 - c = 0.111	c = 2.000	^a 0.490 (0.171) c = 0.556	^a 0.055 (0.074) c = 1.278	^a 0.832 (0.238) c = 0.167	c = 2.000	0.354 (0.180) c = 0.167	0.456 - c = 0.056	0.117 (0.158) c = 1.778	c = 2.000
Preference-Inconsistent	0.094 (0.145) c = 1.556	0.485 (0.235) c = 0.444	- - c = 0.000	c = 2.000	0.389 (0.229) c = 0.500	0.055 (0.064) c = 1.444	0.016 (0.064) c = 0.056	c = 2.000	0.563 - c = 0.056	0.039 (0.033) c = 0.111	0.132 (0.183) c = 1.833	c = 2.000
Neutral	0.049 (0.078) c = 1.722	0.280 (0.168) c = 0.278	- - c = 0.000	c = 2.000	0.250 (0.000) c = 0.167	0.036 (0.062) c = 1.778	0.016 - c = 0.056	c = 2.000	0.526 (0.260) c = 0.167	- - c = 0.000	0.090 (0.133) c = 1.833	c = 2.000

Neutral evidence items are presented here for completeness. However, as noted in footnote 17, neutral evidence items are not used to examine the formal hypotheses.

Given reasoning noted in Appendix D for source attribution accuracy, I also exclude new evidence items from the determination of calibration.

Within a specific cell category, calibration equals $(1/N)\sum_j N_j (f_j - d_j)^2$, where N refers to the total number of confidence assessments made, N_j refers to the number of times a particular confidence assessment level is selected, f_j refers to the corresponding probability for a particular confidence assessment level, and d_j refers to the proportion of times the response is accurate for a particular confidence assessment level. Mean calibration is computed by first computing calibration for each participant based on their responses that fall into a specific cell (and only those responses), and then averaging across participants' computed calibration for that cell.

c = count (number) of questions answered in a specific category, as follows:

- For inside detail cells, count of questions answered in the preference-consistency by actual source reliability by identified source reliability category
- For inside overall row total cells, count of questions answered in the preference-consistency by actual source reliability category
- For outside overall row total cells, count of questions answered in the preference-consistency category
- For outside overall column total cells, count of questions answered in the actual source reliability by identified source

The data presented in Table 5, Panel A are effectively weighted averages, using the above formula computed on an individual basis, for each participant based on the number of responses across multiple cells of this appendix. Therefore, it is not possible to tie back to Table 5 based on the means presented here. However, within each Panel above, the cells pooled overall to calculate calibration presented in Table 5, Panel A are as follows:

- ^a For calibration preference-consistent, see superscript "a"
- ^b For calibration preference-inconsistent, see superscript "b"
- For calibration overall, see both superscripts "a" and "b"

Also, see example calibration index computations in Appendix G, Panel B for the calibration index for a participant in the decision process condition.

APPENDIX G: EXAMPLE CALCULATIONS FOR H3 AND H4

Panel A: Example calculation of “Accurate Preference-Consistent Source Attributions” (dependent measure for H3) for a participant in the “Decision Process Condition”

Measure: Accurate preference-consistent source attributions are either of the following two types of source attributions:

- 1) attribute preference-consistent evidence items provided by the more reliable source to the more reliable source
- 2) attribute preference-inconsistent evidence items provided by the less reliable source to the less reliable source

Purpose: To document the calculation of Participant A’s average confidence in his/her accurate preference-consistent source attributions. Then, given similar calculations for other participants, to document how the overall average confidence is calculated and ties to Table 4, Panel A, for the decision process accountability condition.

Example:

Assume Participant A has three preference-consistent source attributions—one in type 1) and two in type 2). Confidence in each preference-consistent source attribution and average confidence is as follows:

<u>Type</u>	<u>Confidence</u>
1)	6.900
2)	6.000
2)	<u>7.200</u>
Total participant confidence	20.100

Average participant confidence 6.700 (= 20.100 / 3 responses)

There are four total participants in the decision process accountability condition. Similar calculations as above are made for the other three participants. Therefore, the overall average confidence in preference-consistent source attributions for the decision process accountability condition is determined as follows:

<u>Participant</u>	<u>Confidence</u>
A	6.700 (above example)
B	5.000
C	7.000
D	<u>5.667</u>
Total decision process confidence	24.367

Average decision process confidence 6.092 (=24.367 / 4 participants)
(ties to Table 4, Panel A)

Panel B: Example calculations of “Calibration Index” (dependent measure for H4) for a participant in the “Decision Process Condition”

Measure: General calibration index formula:

$$(1/N)\sum_j N_j (f_j - \bar{d}_j)^2, \text{ where}$$

- N refers to the total number of confidence assessments made, N_j refers to the number of times a particular confidence assessment level is selected, f_j refers to the corresponding probability for a particular confidence assessment level, and \bar{d}_j refers to the proportion of times the response is accurate for a particular confidence assessment level.
- Smaller calibration index indicates better calibration.
- Confidence assessment levels^a and corresponding f_j s are as follows:

<u>Assessment level</u>	f_j
1	0.000
2	0.125
3	0.250
4	0.375
5	0.500
6	0.675
7	0.750
8	0.875
9	1.000

Purpose: To document the calculation of participant A’s confidence calibration index for preference-consistent, preference-inconsistent, and combined preference-consistent/inconsistent evidence items.

Example:

Note: The “(.)” in below calculations indicates that, given participant did not select the related confidence level (i.e., $N_j = 0$), there is no corresponding $(f_j - \bar{d}_j)$ value.

Calibration Index – Preference-Consistent Evidence Items

$$= (1/4) [0(.)^2 + 0(.)^2 + 0(.)^2 + 0(.)^2 + 0(.)^2 + 1(0.675 - 1.000)^2 + 2(0.750 - 0.500)^2 + 1(0.875 - 1.000)^2 + 0(.)^2]$$

$$= (1/4) [1(0.106) + 2(0.063) + 1(0.016)]$$

$$= 0.062$$

Calibration Index – Preference-Inconsistent Evidence Items

$$= (1/4) [0(.)^2 + 0(.)^2 + 0(.)^2 + 0(.)^2 + 0(.)^2 + 1(0.675 - 1.000)^2 + 3(0.750 - 0.667)^2 + 0(.)^2 + 0(.)^2]$$

$$= (1/4) [1(0.106) + 3(0.007)]$$

$$= 0.032$$

Calibration Index – Combined Preference-Consistent/Inconsistent Evidence Items

$$= (1/8) [0(.)^2 + 0(.)^2 + 0(.)^2 + 0(.)^2 + 0(.)^2 + 2(0.675 - 1.000)^2 + 5(0.750 - 0.600)^2 + 1(0.875 - 1.000)^2 + 0(.)^2]$$

$$= (1/8) [2(0.106) + 5(0.023) + 1(0.016)]$$

$$= 0.043$$

^a Participants indicate their confidence in their response to each item on a 9-point scale ranging from 1 (completely uncertain) to 9 (completely certain).

FIGURES

FIGURE 1
Graphical Depiction of H1 and RQ1 Results

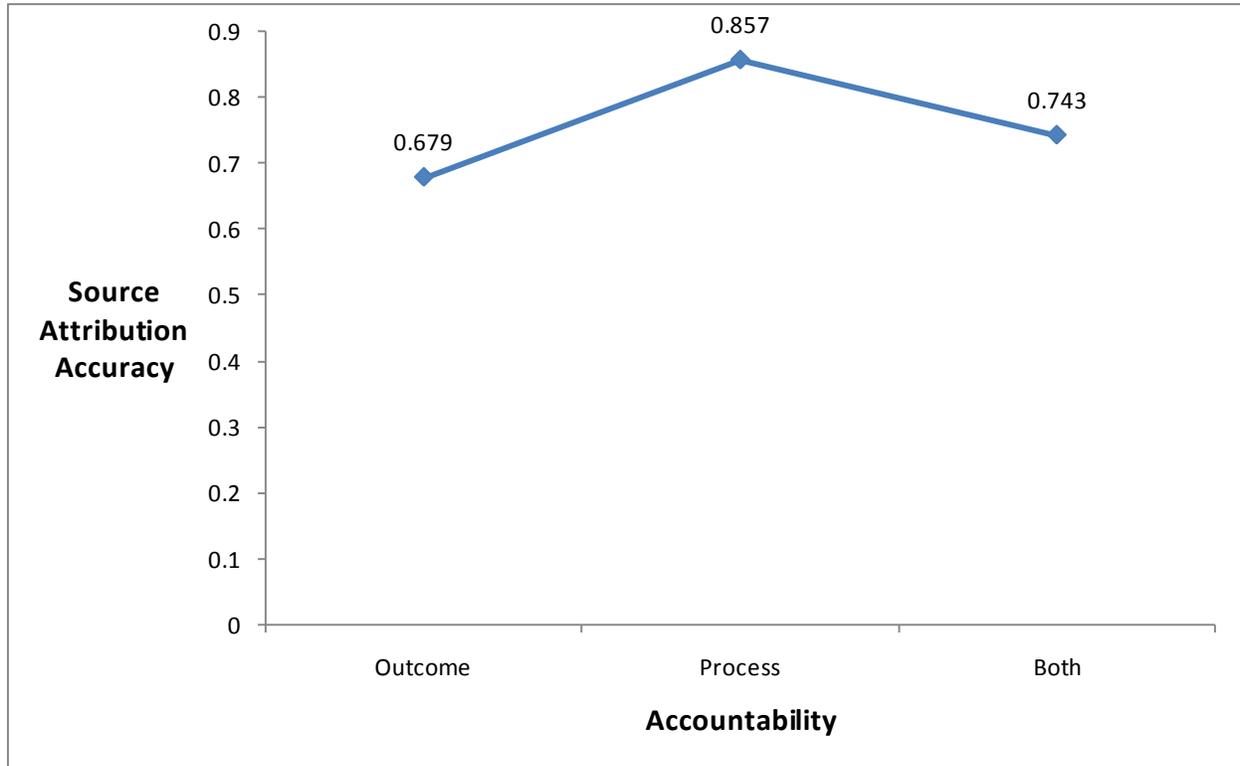


Figure 1 depicts participants' mean source attribution accuracy by accountability condition (also see Table 2, Panel A). Table 2 presents planned contrasts to test H1 (Panel C) and examine RQ1 (Panel D).

FIGURE 2
Graphical Depiction of H2a and H2b Results

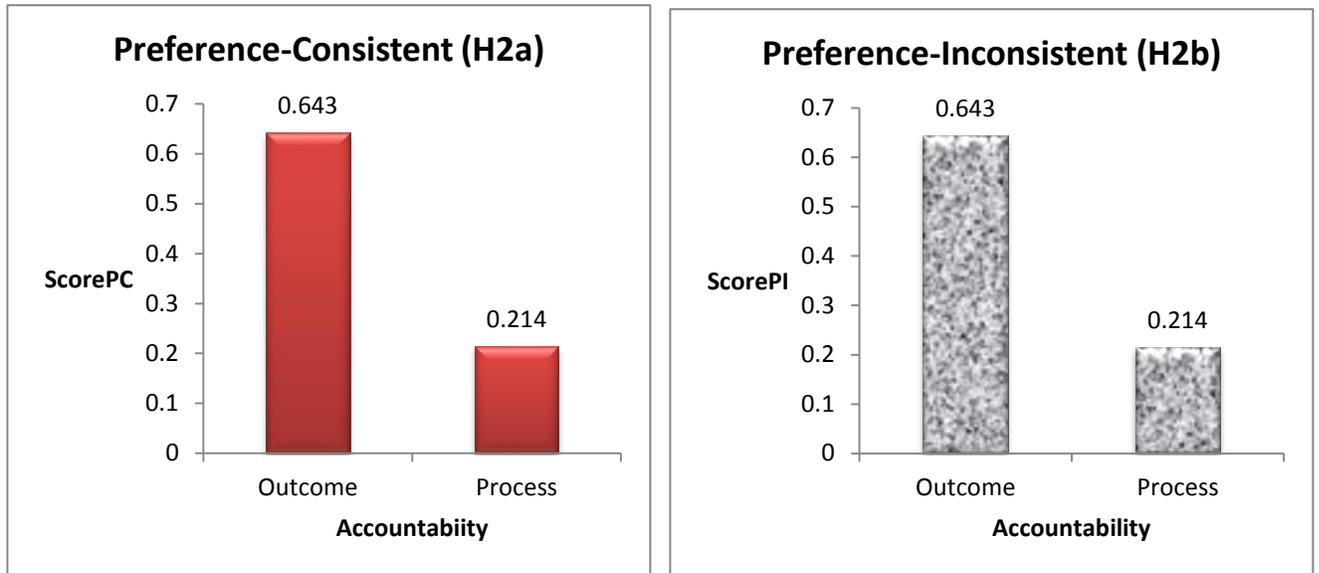


Figure 2 depicts participants' mean score by accountability condition and preference consistency (also see Table 3, Panel A). Table 3, Panel C presents planned contrasts to test H2a and H2b.

FIGURE 3
Graphical Depiction of H3 Results

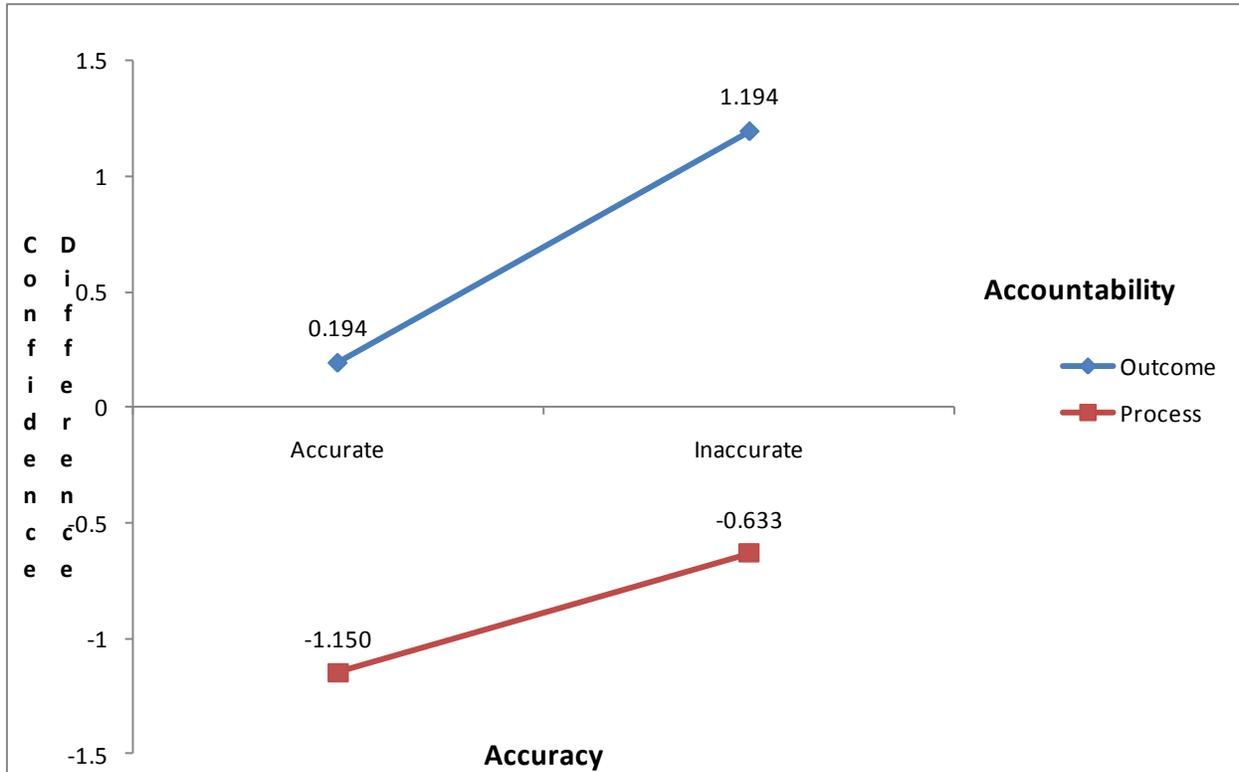


Figure 3 depicts participants' mean confidence difference by accountability condition and accuracy (also see Table 4, Panel A). Table 4, Panel C presents planned contrasts to test H3.

FIGURE 4
Graphical Depiction of H4 and RQ2 Results

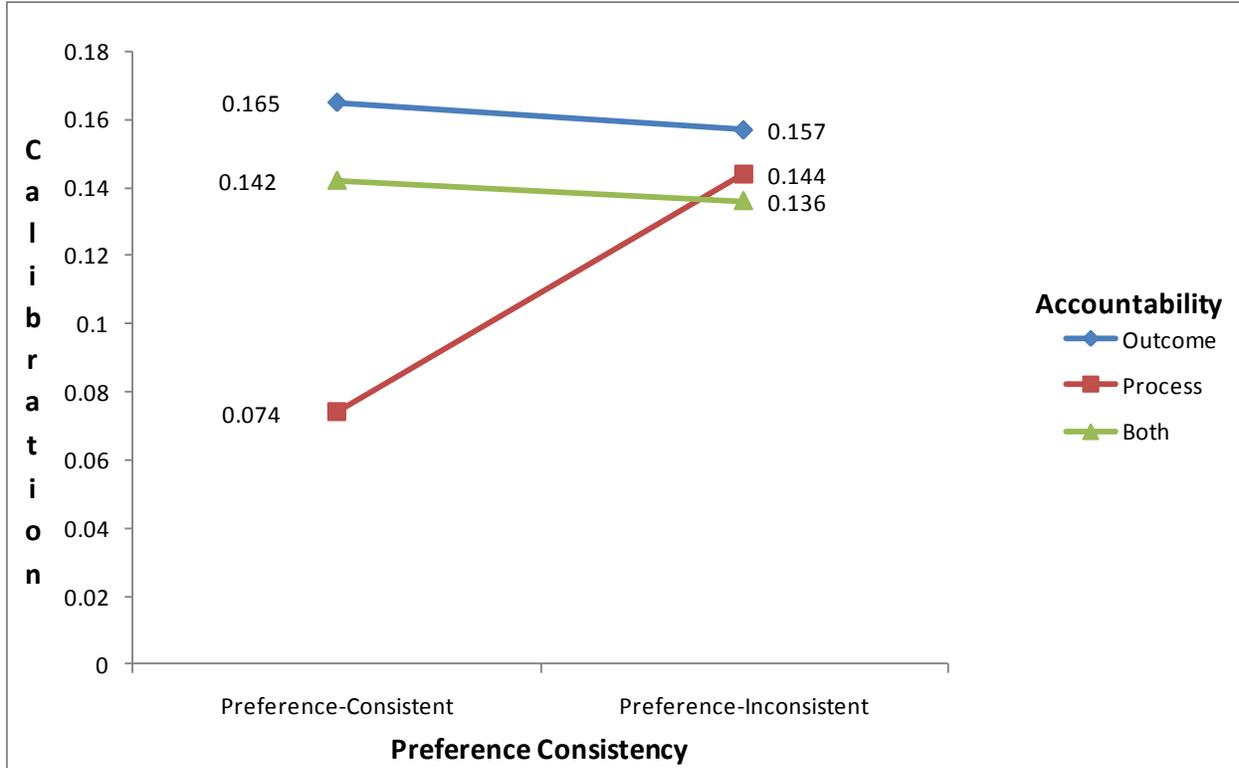


Figure 4 depicts participants' mean calibration by accountability condition and preference consistency (also see Table 5, Panel A). Table 5 presents planned contrasts to test H4 (Panel C) and examine RQ2 (Panel D).

TABLES

TABLE 1
Experiment 1: Manipulation and Comprehension Checks^a

Panel A: Manipulation Checks: Rate of Correct Responses

	<u>Follow-up Conference^b</u>	<u>Response Evaluation, Scoring and Criteria^c</u>	<u>Prize and Basis^d</u>
Decision Outcome Accountability	96.15% n = 25	84.62% n = 22	76.92% n = 20
Decision Process Accountability	92.31% n = 24	73.08% n = 19	69.23% n = 18
Decision Outcome and Decision Process Accountability	88.46% n = 23	92.31% n = 24	69.23% n = 18
Overall	92.31% n = 72	83.33% n = 65	71.79% n = 56

Panel B: Comprehension Checks: Rate of Correct Responses

	<u>Source Reliability^e</u>	<u>Management's Preference^f</u>
Decision Outcome Accountability	73.08% n = 19	92.31% n = 24
Decision Process Accountability	69.23% n = 18	100.00% n = 26
Decision Outcome and Decision Process Accountability	84.62% n = 22	100.00% n = 26
Overall	75.64% n = 59	97.44% n = 78

TABLE 1 (CONTINUED)

Panel C: Manipulation and Comprehension Checks: Rate of Correct Responses - All and Subset

	<u>All</u> ^g	<u>Subset</u> ^h
Decision Outcome Accountability	46.15% n = 12	53.85% n = 14
Decision Process Accountability	50.00% n = 13	53.85% n = 14
Decision Outcome and Decision Process Accountability	53.85% n = 14	69.23% n = 18
Overall	50.00% n = 39	58.97% n = 46

a Of the 78 total participants, 26 each are in the decision outcome accountability, decision process accountability, and decision outcome and decision process accountability conditions.

b Participants were asked: Did the instructions to the study inform you that you may have been selected for a follow-up conference with a member of the Department Faculty who would assume the role of a member of Holt's Board of Directors?

c Participants were asked: Other than the valuation of the four extra credit questions, did the instructions to the study inform you that your responses would be evaluated and scored based on specific criteria? If participants answered yes, they were asked to select an option that reflected what the instructions indicated as the specific criteria. The options were: 1) A score would be computed based on how closely my ASSESSED LIKELIHOOD that my company would continue to operate in the future approximates the assessed likelihood of experienced professionals. 2) A score would be computed based on how closely the REASONING behind my judgment of the likelihood that my company would continue to operate in the future approximates the reasoning of experienced professionals. 3) A combined score would be computed based on both: a) how closely my ASSESSED LIKELIHOOD that my company would continue to operate in the future approximates the assessed likelihood of experienced professionals and b) how closely the REASONING behind my judgment of the likelihood that my company would continue to operate in the future approximates the reasoning of experienced professionals.

d Participants were asked: Did the instructions inform you of a potential additional prize? If participants answered yes, they were asked to select an option that reflected what the instructions indicated as the basis for the cash prize. The options were: 1) Participants would be randomly selected to receive a \$10 gift certificate each. 2) A score would be computed based on how closely your ASSESSED LIKELIHOOD approximates the assessed likelihood of experienced professionals. Participants with the top scores would each receive a \$10 gift certificate. 3) A score would be computed based on how closely the REASONING behind your likelihood judgment approximates the reasoning of experienced professionals. Participants with the top scores would each receive a \$10 gift certificate. 4) Two scores would be computed: a) a score based on how closely your ASSESSED LIKELIHOOD approximates the assessed likelihood of experienced professionals and b) a score based on how closely the REASONING behind your likelihood judgment approximates the reasoning of experienced professionals. Participants with the top combined scores would each receive a \$10 gift certificate.

TABLE 1 (CONTINUED)

- e Participants were asked: In your opinion, how knowledgeable is Nick compared to Andrew in providing evidence to evaluate the extent to which a potential environmental liability exists? Participants assessed the relative knowledge of the two sources on a scale ranging from 1 (Nick much more knowledgeable) to 9 (Andrew much more knowledgeable), with midpoint 5 (about the same knowledge).
- f Participants were asked: Do managers generally have a preference for a going concern assessment for their companies? If participants answered yes, they were asked to select an option that reflected managers' general preference. The options were a manager prefers to find that a company: 1) will continue to operate in the future or 2) will not continue to operate in the future.
- g The rate of correct responses for participants who passed all five primary manipulation and comprehension check questions.
- h The rate of correct responses for participants who passed a subset, at least four out of five, of the primary manipulation and comprehension check questions. That is, participants may have failed the one manipulation check regarding the prize and its basis.

TABLE 2
Source Attribution Accuracy (H1 and RQ1)

Panel A: Descriptive Statistics – Mean (Standard Deviation)

	Source Attribution Accuracy^a
Decision Outcome Accountability	0.679 (0.218) n = 14
Decision Process Accountability	0.857 (0.146) n = 14
Decision Outcome and Decision Process Accountability	0.743 (0.189) n = 18
Overall	0.758 (0.196) n = 46

TABLE 2 (CONTINUED)

Panel B: Overall Categorical ANOVA Results

	<u>df</u>	<u>Chi-Square</u>	<u>p-value</u> ^b
Intercept	1	807.15	< 0.0001
Cell	2	8.21	0.017

Panel C: Planned Contrast Results – Hypothesis H1

<u>Contrast</u>	<u>Chi-Square</u>	<u>p-value</u> ^b
Source Attribution Accuracy (H1): Decision Outcome < Decision Process	7.00	0.004

Panel D: Planned Contrast Results – Research Question RQ1

<u>Contrast</u>	<u>Chi-Square</u>	<u>p-value</u> ^b
Source Attribution Accuracy (RQ1): Decision Outcome/Process < Decision Process	3.96	0.047 (two-tailed)
Source Attribution Accuracy (RQ1): Decision Outcome/Process > Decision Outcome	0.83	0.363 (two-tailed)

a The proportion of original evidence items participants attributed to the correct source.

b P-values for the categorical ANOVA are two-tailed; p-values for the planned contrasts are one-tailed unless otherwise indicated.

TABLE 3
Incorrect Responses by Preference-Consistency (H2a and H2b)

Panel A: Descriptive Statistics – Mean (Standard Deviation)

	<u>Score</u> <u>Preference-</u> <u>Consistent^a</u>	<u>Score</u> <u>Preference-</u> <u>Inconsistent^b</u>
Decision Outcome Accountability	0.643 (0.745) n = 14	0.643 (0.633) n = 14
Decision Process Accountability	0.214 (0.426) n = 14	0.214 (0.426) n = 14
Decision Outcome and Decision Process Accountability	0.722 (0.752) n = 18	0.444 (0.705) n = 18
Overall	0.543 (0.690) n = 46	0.435 (0.620) n = 46

TABLE 3 (CONTINUED)**Panel B: Overall ANOVA Results**

	<u>df</u>	<u>MSE</u>	<u>F-statistic</u>	<u>p-value^c</u>
<i>Score – H2a:</i>				
Accountability	2	1.115	2.50	0.094
Error	43	0.446		
Corrected Total	45			
<i>Score – H2b:</i>				
Accountability	2	0.644	1.73	0.190
Error	43	0.372		
Corrected Total	45			

Panel C: Planned Contrast Results – Hypotheses H2a and H2b

<u>Contrast</u>	<u>Estimate (Std error)</u>	<u>t-statistic</u>	<u>p-value^c</u>
Score _{Preference-Consistent} (H2a): Decision Outcome > Decision Process	0.429 (0.252)	1.70	0.048
Score _{Preference-Inconsistent} (H2b): Decision Outcome > Decision Process	0.429 (0.231)	1.86	0.035

a The number of preference-consistent evidence items participants (1) correctly identified as previously viewed but incorrectly attributed to the more reliable source, or (2) incorrectly identified as previously viewed and then attributed to the more reliable source.

b The number of preference-inconsistent evidence items participants (1) correctly identified as previously viewed but incorrectly attributed to the less reliable source, or (2) incorrectly identified as new but previously viewed and provided by the more reliable source.

c P-values for the ANOVAs are two-tailed; p-values for the planned contrasts are one-tailed unless otherwise indicated.

TABLE 4
Difference in Confidence Based on Preference-Consistency (H3)

Panel A: Descriptive Statistics – Mean (Standard Deviation)

Accurate Source Attributions:

	Confidence Preference- Consistent^a	Confidence Preference- Inconsistent^b	Confidence Difference (Preference-Consistent - Preference-Inconsistent)^c
Decision Outcome Accountability	7.278 (1.099) n = 6	7.083 (1.119) n = 6	0.194 (1.339) n = 6
Decision Process Accountability	6.092 (0.925) n = 4	7.242 (1.101) n = 4	-1.150 (0.644) n = 4
Decision Outcome and Decision Process Accountability	7.452 (1.114) n = 11	7.282 (1.622) n = 11	0.170 (1.564) n = 11
Overall	7.143 (1.153) n = 21	7.217 (1.349) n = 21	-0.075 (1.421) n = 21

Inaccurate Source Attributions:

	Confidence Preference- Consistent^d	Confidence Preference- Inconsistent^e	Confidence Difference (Preference-Consistent - Preference-Inconsistent)^f
Decision Outcome Accountability	6.417 (0.492) n = 6	5.222 (2.228) n = 6	1.194 (2.056) n = 6
Decision Process Accountability	6.167 (1.106) n = 4	6.800 (0.423) n = 4	-0.633 (0.848) n = 4
Decision Outcome and Decision Process Accountability	5.882 (1.457) n = 11	5.991 (1.666) n = 11	-0.109 (1.037) n = 11
Overall	6.089 (1.167) n = 21	5.925 (1.720) n = 21	0.163 (1.479) n = 21

TABLE 4 (CONTINUED)**Panel B: Mixed Model ANOVA Results**

	<u>df</u>	<u>MSE</u>	<u>F-statistic</u>	<u>p-value^g</u>
Between Participants Effects:				
Accountability	2	6.042	2.29	0.130
Error (Accountability)	18	2.635		
Within Participants Effects:				
Accuracy	1	1.509	1.28	0.273
Accuracy x Accountability	2	1.683	1.42	0.267
Error (Accuracy x Accountability)	18	1.182		

Panel C: Planned Contrast Results – Hypothesis H3

<u>Contrast</u>	<u>Estimate (Std error)</u>	<u>t-statistic</u>	<u>p-value^g</u>
Accurate Confidence Difference (Preference-Consistent – Preference-Inconsistent) (H3): Decision Outcome > Decision Process	1.344 (0.896)	1.50	0.075
Inaccurate Confidence Difference (Preference-Consistent – Preference-Inconsistent) (H3): Decision Outcome > Decision Process	1.828 (0.888)	2.06	0.027

-
- a The confidence in participants' accurate preference-consistent source attributions.
- b The confidence in participants' accurate preference-inconsistent source attributions.
- c The difference between 1) confidence in participants' accurate preference-consistent source attributions and 2) confidence in participants' accurate preference-inconsistent source attributions.
- d The confidence in participants' inaccurate preference-consistent source attributions.
- e The confidence in participants' inaccurate preference-inconsistent source attributions.
- f The difference between 1) confidence in participants' inaccurate preference-consistent source attributions and 2) confidence in participants' inaccurate preference-inconsistent source attributions.
- g P-values for the ANOVA are two-tailed; p-values for the planned contrasts are one-tailed unless otherwise indicated.

TABLE 5
Confidence Calibration Index (H4 and RQ2)

Panel A: Descriptive Statistics – Mean (Standard Deviation)

	<u>Calibration Preference- Consistent^a</u>	<u>Calibration Preference- Inconsistent^b</u>	<u>Calibration Overall^c</u>
Decision Outcome Accountability	0.165 (0.114) n = 14	0.157 (0.070) n = 14	0.119 (0.060) n = 14
Decision Process Accountability	0.074 (0.098) n = 14	0.144 (0.133) n = 14	0.094 (0.079) n = 14
Decision Outcome and Decision Process Accountability	0.142 (0.136) n = 18	0.136 (0.132) n = 18	0.096 (0.073) n = 18
Overall	0.128 (0.122) n = 46	0.145 (0.115) n = 46	0.102 (0.071) n = 46

TABLE 5 (CONTINUED)**Panel B: Mixed Model ANOVA Results**

	<u>df</u>	<u>MSE</u>	<u>F-statistic</u>	<u>p-value^d</u>
Between Participants Effects:				
Accountability	2	0.019	1.43	0.251
Error (Accountability)	43	0.013		
Within Participants Effects:				
Consistency	1	0.008	0.55	0.462
Consistency x Accountability	2	0.014	0.97	0.388
Error (Consistency x Accountability)	43	0.015		

Panel C: Planned Contrast Results – Hypothesis H4

<u>Contrast</u>	<u>Estimate (Std error)</u>	<u>t-statistic</u>	<u>p-value^d</u>
Calibration _{Preference-Consistent} (H4) Decision Outcome > Decision Process:	0.090 (0.045)	2.01	0.026
Calibration _{Preference-Inconsistent} (H4) Decision Outcome > Decision Process:	0.013 (0.044)	0.29	0.387

TABLE 5 (CONTINUED)

Panel D: Planned Contrast Results – Research Question RQ2

<u>Contrast</u>	<u>Estimate (Std error)</u>	<u>t-statistic</u>	<u>p-value^d</u>
Calibration _{Preference-Consistent} (RQ2) Decision Outcome/Process < Decision Process:	-0.067 (0.042)	-1.59	0.119 (two-tailed)
Calibration _{Preference-Consistent} (RQ2) Decision Outcome/Process < Decision Outcome:	0.023 (0.042)	0.54	0.594 (two-tailed)
Calibration _{Preference-Inconsistent} (RQ2) Decision Outcome/Process < Decision Process:	0.008 (0.042)	0.20	0.844 (two-tailed)
Calibration _{Preference-Inconsistent} (RQ2) Decision Outcome/Process < Decision Outcome:	0.021 (0.042)	0.51	0.616 (two-tailed)

a The confidence calibration index for preference-consistent source attributions. Generally, the calibration index is calculated as $(1/N)\sum_j N_j(f_j - \bar{d}_j)^2$, where N refers to the total number of confidence assessments made, N_j refers to the number of times a particular confidence assessment level is selected, f_j refers to the corresponding probability for a particular confidence assessment level, and \bar{d}_j refers to the proportion of times the response is accurate for a particular confidence assessment level.

b The confidence calibration index for preference-inconsistent source attributions.

c The confidence calibration index for source attributions overall.

d P-values for the ANOVA are two-tailed; p-values for the planned contrasts are one-tailed unless otherwise indicated.