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## Using Cultural Mindsets to Reduce Cross-National Auditor Judgment Differences\*

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### ABSTRACT

In a globalized audit environment, regulators and researchers have expressed concerns about inconsistent audit quality across nations, with a particular emphasis on Chinese audit quality. Prior research suggests Chinese audit quality may be lower than U.S. audit quality due to a weaker institutional environment (e.g., lower litigation and inspection risk) or cultural value differences (e.g., greater deference to authority). In this study, we propose that lower Chinese audit quality could also be due to Chinese auditors' different cognitive processing styles (i.e., cultural mindsets). We find U.S. auditors are more likely to engage in an analytic mindset approach, focusing on a subset of disconfirming information, whereas Chinese auditors are more likely to take a holistic mindset approach, focusing on a balanced set of confirming and disconfirming information. As a result, Chinese auditors make less skeptical judgments compared to U.S. auditors. We then propose an intervention in which we explicitly instruct auditors to consider using both a holistic and an analytic mindset approach when evaluating evidence. We find this intervention minimizes differences between Chinese and U.S. auditors' judgments by shifting Chinese auditors' attention more towards disconfirming evidence, improving their professional skepticism, while not causing U.S. auditors to become less skeptical. Our study contributes to the auditing literature by identifying cultural mindset differences as a causal mechanism underlying lower professional skepticism levels among Chinese auditors compared to U.S. auditors, and providing standard setters and firms with a potential solution that can be adapted to improve Chinese auditors' professional skepticism and reduce cross-national auditor judgment differences.

**Keywords:** *cultural mindsets; professional skepticism; cognitive processing; fair value estimates; group audits.*

## 1. Introduction

As companies expand their reach on a global basis, audit firms engage in multinational audits, creating significant coordination and supervisory challenges (e.g., Barrett, Cooper, and Jamal 2005; Hanes 2013; Hinds, Liu, and Lyon 2011; Sunderland and Trompeter 2017).

Although audit firms try to address these challenges through global audit methodologies and coordinated training programs (Sunderland and Trompeter 2017), differences in auditor behavior exist across nations, even within the same firm (Barrett et al. 2005; Bik and Hooghiemstra 2018; Ferguson 2015; O'Donnell and Prather-Kinsey 2010). Prior research has identified various institutional and cultural factors as potential causes for cross-national differences in auditor behavior, including differences in regulatory enforcement, litigation risk, inspection risk, and standards setting (Leuz 2010), as well as cultural value differences (e.g., deference to authority and propensity for risk-taking; see Nolder and Riley 2014 for a review). However, one factor not previously examined in the auditing literature is whether and how cross-cultural differences in cognition affect auditor behavior, particularly their professional skepticism.

In this study, we investigate how differences in “cultural mindsets” (i.e., cross-cultural differences in individuals’ cognitive processing as indicated by their attention to information) result in different levels of professional skepticism across countries. In particular, we focus on skepticism differences between Chinese and U.S. auditors because regulators and researchers have expressed concerns regarding Chinese audit quality. Specifically, the PCAOB has expressed concerns about the Chinese auditing environment (PCAOB 2011), while the SEC has

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conducted extensive investigations into Chinese financial reporting and related audits (Schapiro 2011). Consistent with this, researchers have found that Chinese auditors exhibit behaviors indicative of lower professional skepticism compared to auditors from jurisdictions with stronger regulatory oversight, such as the U.S., Canada, and the U.K. (e.g., Ke, Lennox, and Xin 2015; Lin and Fraser 2008; Patel, Harrison, and McKinnon 2002). Considering China is one of the fastest-growing and largest markets in the world (Woetzel et al. 2019; Focus Economics 2019), it is important to understand why Chinese auditors exhibit lower professional skepticism levels compared to U.S. auditors. More importantly, we leverage our knowledge of cultural mindset differences to create an intervention that increases Chinese auditors' professional skepticism, making their judgments more comparable with U.S. auditors, whose professional skepticism is often relatively higher (e.g., Fleming, Chow, and Su 2010; Tsui 1996).

Psychological studies suggest individuals with different cultural backgrounds could have different mindsets, which significantly affect the way they process information and make judgments (Oyserman 2011). Directly pertaining to our study, research on cultural differences in attention and reasoning suggests that individuals from the U.S. tend to adopt an analytic mindset approach (i.e., focusing on the details of individual objects, or a more “detail-oriented” approach), while individuals from China tend to adopt a holistic mindset approach (i.e., focusing on the inter-relationships of objects and their environment, or a more “integrative” approach; see Nisbett, Peng, Choi, and Norenzayan 2001; Norenzayan, Choi, and Peng 2007). In other words,

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individuals from the U.S. are more likely to focus on the most salient individual objects, while individuals from China are more likely to integrate a variety of objects to draw inferences.

Applying this logic to an audit setting, we expect that when evaluating a set of information, U.S. auditors will focus on a distinct subset of salient relevant information while Chinese auditors will integrate a wider variety of information (i.e., a more balanced approach). In particular, given a set of information that either confirms or disconfirms management's reporting preferences, we expect U.S. auditors will focus on the subset of disconfirming information due to the regulatory and legal environment in the U.S. In contrast, we expect Chinese auditors will take a more balanced approach to both confirming and disconfirming information, leading to less skeptical judgments than U.S. auditors, as prior research indicates that incorporating more confirming information dilutes the impact of disconfirming information (Hoffman and Patton 1997).

Moreover, we investigate how knowledge of cultural mindsets can be leveraged to improve Chinese auditors' skepticism so their judgments can be similar to U.S. auditors' more skeptical judgments. Given prior research showing mindsets impact auditors' information processing and professional skepticism (e.g., Backof, Carpenter, and Thayer 2018; Griffith, Hammersley, Kadous, and Young 2015; Nolder and Kadous 2018; Rasso 2015), we propose an intervention that explicitly instructs auditors to use both a holistic and an analytic mindset approach. We predict this intervention will cause Chinese auditors to increase their attention to disconfirming information, resulting in more skeptical judgments compared to Chinese auditors

who do not receive the intervention. In contrast, we do not expect that the intervention will lead U.S. auditors to provide less skeptical judgments, as the strict U.S. institutional (i.e., regulatory, litigation, inspection) environment makes it unlikely that the intervention will shift U.S. auditors' attention away from disconfirming evidence. In sum, we predict that Chinese auditors who receive this intervention will attend to a similar information set as U.S. auditors, leading to Chinese auditor judgments that are not only more skeptical, but also more comparable to U.S. auditors' judgments.

To test our hypothesis, we conducted a between-participants experiment to evaluate auditor judgments in a control condition versus an intervention condition. We recruited audit seniors from all Big 4 accounting firms in both China and the U.S. Within each country, auditors in the intervention condition began by learning about analytic and holistic mindsets and they were told there is value in using both a holistic and an analytic mindset approach. Auditors in the control condition did not see any information on analytic versus holistic mindsets. We then asked auditors to evaluate a company's long-term earnings growth rate for a fair value estimate related to potential goodwill impairment.<sup>1</sup>

We find that, absent intervention (i.e., in the control condition), U.S. auditors focus more on disconfirming information relative to confirming information, whereas Chinese auditors focus equally on both confirming and disconfirming information. As a result, compared to U.S.

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<sup>1</sup> This task provides the key test of our hypothesis. Prior to this task, we also asked auditors to complete a task adapted from psychology research and an additional audit task related to an inventory obsolescence judgment. Please see detailed discussions of those tasks in Section 4.

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auditors, Chinese auditors provide higher estimates of the long-term earnings growth rate, reflecting less skeptical judgments. We then find our intervention shifts Chinese auditors' attention from a balanced focus to a greater focus on disconfirming information, leading to more skeptical judgments that are closer to U.S. auditors' judgments. In contrast, we find the intervention does not cause U.S. auditors to become less skeptical. We also consider potential alternative explanations and our results remain robust after controlling for perceived differences in litigation risk and inspection risk, as well as differences in power distance (i.e. deference to authority).

To determine whether the results of our study represent the optimal outcome, we conducted interviews with six audit partners and one senior manager, all with considerable multinational audit experience at large international audit firms. This expert panel reviewed our case materials and made an independent judgment on the case used to test our hypothesis.<sup>2</sup> This expert panel's consensus judgment for the case was identical to the U.S. senior-level auditors' mean judgments in our study, suggesting the U.S. senior auditors' judgments were of high quality. Since our intervention causes the Chinese auditors' judgments to become more skeptical and converge with the U.S. auditors' higher-quality judgments, this indicates that our intervention improves Chinese auditors' judgment quality. Additionally, these highly experienced interviewees confirm that cross-national auditor judgment comparability is highly

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<sup>2</sup> All of our interviewees are U.S. based. We rely on highly experienced U.S. auditors' opinions to provide an expert panel judgment, as their judgments are likely of high quality given the strict institutional environment in the U.S. (Choi, Kim, Liu, and Simunic 2008; Francis and Wang 2008; Leuz 2010).



important to audit practice, because it reduces audit risk and potentially improves financial reporting comparability (cf. Francis, Pinnuck, and Watanabe 2014).

Our study contributes to the auditing literature by providing evidence that culture impacts professional skepticism through cognitive processing. Nolder and Kadous (2018) propose that, in order to improve professional skepticism, auditors need to change their cognitive processing. Our results illustrate the mediating role of cognitive processing on auditors' skeptical judgments, providing evidence supporting the theoretical framework proposed by Nolder and Kadous (2018). Importantly, we demonstrate that Chinese auditors are not inherently less skeptical, but rather they focus on different information than U.S. auditors, resulting in less skeptical judgments. Further, we show Chinese auditors' skeptical judgments can be improved by shifting their attention to disconfirming information through a mindset intervention.

We also add to the auditing literature by showing that culture affects auditor judgments not only through values and/or norms, but also through other dimensions such as cultural mindsets. In doing so, our study moves auditing cultural research away from the cultural values-based approach that assumes culture is a stable trait towards a more dynamic approach that shows culture is malleable. Nolder and Riley (2014) note such an approach can lead to practical interventions to improve cross-cultural auditor judgment comparability, as evidenced by our proposed intervention. Specifically, we demonstrate that a mindset intervention can reduce potentially detrimental effects of cross-cultural cognition differences, also answering calls in the psychology literature (e.g., Nisbett and Miyamoto 2005; Yates and de Oliveira 2016).

Our findings also have important implications for audit firms, auditors, and regulators. Sunderland and Trompeter (2017) discuss how group auditors often have to rely extensively on the work and judgments of foreign component auditors. The extent to which these foreign component auditors provide a uniform level of high audit quality is concerning to regulators (IAASB 2015; PCAOB 2016). Although audit firms have global audit methodologies and standardized staff training to promote high global audit quality, cross-national auditor judgments differ, even within the same firm (Barrett et al. 2005; Bik and Hooghiemstra 2018). Our study identifies cultural mindset as an important factor that contributes to cross-national auditor judgment differences, helping both academics and practitioners understand that auditors from different nations may process information differently and make different professional judgments, even with the same set of audit evidence and the same audit procedures. Audit firms should introduce the concept of cultural mindset differences in their training sessions to help auditors understand how cultural mindsets potentially influence their own judgments as well as the judgments of foreign component auditors involved in multinational group audits. Further, firms could consider incorporating our intervention into broader mindset training (e.g., Griffith, Hammersley, Kadous, and Young's (2015) deliberative mindset approach) as they continue to develop ways to improve auditor professional skepticism.

## 2. Background and Hypothesis

### *Audit Quality and Professional Skepticism in China*

Both the PCAOB and SEC have expressed concerns about Chinese financial reporting and auditing quality (PCAOB 2011; Schapiro 2011). Archival studies provide empirical support for these concerns, showing Chinese firms engage in more earnings management and are less conservative than U.S. firms (Ball, Robin, and Wu 2003; Chen, Cheng, Lin, Lin, and Xiao 2016) and audit quality is lower in China compared to other jurisdictions, even when the auditors are from the same global audit firm (Ke et al. 2015). These audit quality differences persist even though global audit firms adopt standardized training and global audit methodologies to achieve a uniformly high level of worldwide audit quality (Sunderland and Trompeter 2017).

Researchers have identified various causes for why Chinese auditors fail to provide the same level of audit quality as U.S. auditors, including differences in institutional features such as legal liability, regulatory enforcement, and inspection systems (e.g., Choi et al. 2008; Francis and Wang 2008; Ke et al. 2015; Leuz 2010) as well as cultural differences (see Nolder and Riley 2014).

In a comprehensive literature review of the impact of culture on cross-national auditor judgments, Nolder and Riley (2014) cite extensive research showing Chinese auditors are more likely to support client preferences than Westerners, reflecting a potentially insufficient level of professional skepticism (e.g., Ge and Thomas 2008; Fleming et al. 2010; Lin and Fraser 2008;

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Tsui 1996).<sup>3</sup> Nolder and Riley (2014) discuss various causes for why Chinese auditors may exhibit lower levels of skepticism than U.S. auditors, such as differences in power distance or risk tolerance. For example, compared to Western auditors, East Asian auditors exhibit greater levels of power distance in that they are more accepting of differences in hierarchy and more deferential to those in higher positions of power (Cohen, Pant, and Sharp 1993, 1995; Hofstede 2001; Patel et al. 2002). An unwillingness to challenge those in greater positions of power (e.g., client management) is likely antithetical to the auditor's "watchdog" role and therefore could lead to lower levels of professional skepticism. Also, compared to U.S. individuals, Chinese individuals are likely to make more risky decisions because they live in a collectivist society that is more likely to "cushion" losses (Hsee and Weber 1999). Such willingness to take greater risks may result in tolerance for higher levels of acceptable audit risk and lower levels of professional skepticism. Consistent with this, Yamamura, Frakes, Sanders, and Ahn (1996) find East Asian auditors are likely to require fewer audit procedures than U.S. auditors.

While prior cultural and accounting research mainly focuses on whether and how cultural values impact behavior, researchers suggest moving away from this values-based approach (e.g., Caprar, Devinney, Kirkman, and Caligiuri 2015; Earley 2006; Kirkman, Lowe, and Gibson 2017;

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<sup>3</sup> While our study focuses on auditors in China and the U.S., we build on prior psychology and auditing research that investigates cultural differences in various nations, but whose findings are relevant to our context. When studies relied on nations such as Japan, Korea, and Malaysia, we refer to the participants in those studies as "East Asians." Similarly, we use the term "Westerners" to refer to participants in studies conducted in nations such as the United Kingdom, Australia, and Canada. These terms are consistent with conventions used in prior cross-cultural research.

Leung and Morris 2015; Nolder and Riley 2014).<sup>4</sup> Leung and Morris (2015) propose a way forward by suggesting that, in addition to values, cultural behavior differences can be based on behavioral norms and/or cognitive schemas (i.e., mindsets). Hence, in this study, we take a new approach of examining the impact of different cultural mindsets on Chinese versus U.S. auditors' professional skepticism.

### ***Cultural Mindsets***

Psychology research on culture and cognition suggests that cultural backgrounds influence how individuals process information and make judgments (Nisbett et al. 2001; Norenzayan et al. 2007). Building on this stream of literature, we propose that cultural differences in cognition could be a source of judgment differences between Chinese and U.S. auditors, consistent with Nolder and Kadous's (2018) proposition that mindsets and attitudes impact auditors' cognitive processing and skeptical judgments.

Research on cultural differences in attention and reasoning categorizes two systems of thought: analytic versus holistic (Nisbett et al. 2001; Norenzayan et al. 2007). The analytic mindset involves detaching focal objects from their context (field independence), focusing more

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<sup>4</sup> Hofstede (1980, 2001) categorized various dimensions on which values may vary across national cultures, developing a parsimonious national culture framework consisting of six cultural dimensions, including Individualism–Collectivism, Power Distance, Uncertainty Avoidance, Masculinity–Femininity, Long Term–Orientation, and Indulgence–Restraint. Schwartz (1999) subsequently developed a seven-dimension cultural model, including Embeddedness, Harmony, Egalitarian Commitment, Intellectual Autonomy, Affective Autonomy, Mastery, and Hierarchy, while House and his team introduced the GLOBE framework, including Power Distance, Uncertainty Avoidance, Humane Orientation, Collectivism I, Collectivism II, Assertiveness, Gender Egalitarianism, Future Orientation, and Performance Orientation (House, Hanges, Javidan, Dorfman, and Gupta 2004). Currently, the cross-cultural frameworks of Hofstede, Schwartz, and GLOBE jointly shape contemporary international business and management research on cultural value differences (Stahl and Tung 2015).

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on the properties of specific objects as opposed to relations between objects, and relying on rules to classify and reason. By contrast, the holistic mindset involves paying attention to the context (field dependence), focusing on the relations between objects, and relying on similarity to classify and reason. In summary, an analytic mindset tends to focus on each object in isolation and on the details of each object, while a holistic mindset tends to focus on the overall context and inter-relationships of multiple objects (Nisbett et al. 2001).<sup>5</sup>

Nisbett and his colleagues have gathered extensive evidence demonstrating Westerners tend to exhibit an analytic cognitive style, while East Asians tend to display a holistic cognitive style. Westerners' attention abstracts objects from their context, while East Asians' attention relates objects to their context (Masuda and Nisbett 2001). Ji, Peng, and Nisbett (2000) find Chinese subjects are more field-dependent than American subjects. Chua, Boland, and Nisbett (2005) show Chinese and American students have different patterns of visual exploration of a scene, where Americans focus on the main object of the scene but Chinese individuals pay greater attention to the background. These different attention patterns affect Westerners' and East Asians' perceptions (for a review, see Nisbett and Miyamoto 2005).

One similarity between these psychological tasks and audit tasks is that both require participants to integrate different pieces of information to form final judgments. Overall, the

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<sup>5</sup> Nisbett and his colleagues do not refer to analytic and holistic cognitive styles as "mindsets." However, Oyserman (2011) includes analytic and holistic cognitive styles as forms of "cultural mindsets." She defines cultural mindsets as "a set of mental representations or cognitive schema containing *culture-congruent* mental content...cognitive procedures...and goals" (p. 165). Consistent with Oyserman, we refer to analytic and holistic cognitive styles as mindsets. Using the term "mindset" is also consistent with prior audit research (e.g., Griffith, Hammersley, Kadous, and Young 2015), audit firm professional judgment frameworks (e.g., Ranzilla, Chevalier, Herrman, Glover, and Prawitt 2011), and auditing standards (e.g., AS 2401.13).

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findings from psychological studies suggest U.S. individuals are more likely to think analytically and attend to the most salient individual objects, while Chinese individuals are more likely to think holistically and attend to the relationships among a broad set of objects. Accordingly, we expect that, given a set of information, U.S. auditors will focus more on a subset of salient information that is most relevant for their judgments, while Chinese auditors will take a more balanced approach and consider information with various features and attributes.

One important attribute of information that has implications for auditors' judgments is whether a piece of information supports a client's position. We define the valence of information as confirming if it supports a client's position, and disconfirming if it does not support a client's position.<sup>6</sup> Since auditors are trained to exhibit professional skepticism, disconfirming information should be particularly important for auditors to consider.<sup>7</sup> Given that U.S. auditors tend to think analytically and focus on individual pieces of information with important implications, we predict U.S. auditors will focus more on disconfirming information relative to confirming information. In contrast, since East Asians tend to think more holistically and inter-relate a wider variety of information, we expect Chinese auditors will take a more balanced approach to both confirming and disconfirming information. This balanced approach could be problematic as Hoffman and Patton (1997) demonstrate that when an auditor attends to an

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<sup>6</sup> We use the terms confirming and disconfirming because these terms make no assumption about the directionality of management's preferences. This approach is also consistent with recent PCAOB efforts to encourage appropriate attention to information that contradicts management assertions (e.g., PCAOB 2012).

<sup>7</sup> The PCAOB encourages auditors to critically evaluate evidence regardless of whether the evidence confirms or disconfirms management's assertions (PCAOB 2012). However, the PCAOB has criticized audit firms for over-relying on information that supports management's positions and failing to adequately consider information that contradicts management's positions (Austin, Hammersley, and Ricci 2019; PCAOB 2012).

information set containing more confirming information, their judgments become more favorable towards the client's position. Accordingly, a holistic, balanced approach to confirming and disconfirming information could lead Chinese auditors to provide less skeptical judgments than U.S. auditors who focus more on disconfirming information as opposed to confirming information because of an analytic mindset. This suggests a previously unidentified reason why Chinese auditors tend to make less skeptical judgments than U.S. auditors. This knowledge can then be used to develop an intervention to improve Chinese auditors' professional skepticism.<sup>8</sup>

### ***Mindset Intervention***

Nolder and Kadous (2018) propose that interventions shifting auditors' mindsets can enhance their professional skepticism. This is consistent with prior auditing research showing mindsets can change auditors' information processing and professional judgments (e.g., Backof et al. 2018; Griffith, Hammersley, Kadous, and Young 2015; Rasso 2015). However, auditors may not be aware of how their cultural mindsets influence their judgments in practice. Nisbett et al. (2001) argue that individuals are often unaware of the impact of culture on their judgment and decision making, as the origin of Eastern and Western thought systems (e.g., holistic versus analytic thought) traces back thousands of years to the marked differences in "the societies, philosophical orientations, and scientific outlooks of two highly sophisticated cultures: those of

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<sup>8</sup> Not only does such an intervention provide a practical contribution to improve Chinese auditors' professional skepticism, it also provides a test of the underlying theory. We theorize cultural mindset as a previously unidentified factor contributing to Chinese and U.S. auditor judgment differences. If an intervention that changes auditors' mindsets reduces auditor judgment differences, then it provides compelling evidence that such differences are at least partially due to that particular mindset (see Pirlott and MacKinnon 2016 for a discussion of how moderation provides a test of underlying theory).



ancient China and Greece” (Nisbett et al. 2001, 292). The literature on unconscious biases generally finds awareness of a bias is an important step in reducing the effects of such biases (see Fay and Montague 2015 for a discussion).<sup>9</sup>

We posit that explicitly informing auditors about the influence of holistic and analytic mindsets and instructing them to incorporate both a holistic and an analytic mindset approach could potentially lead auditors from different countries to process and attend to information similarly, thereby reducing the impact of cultural mindset differences on auditors’ skeptical judgments. Prior research has demonstrated that “culture” is surprisingly malleable (Lücke, Kostova, and Roth 2014). For example, Hong, Morris, Chiu, and Benet-Martínez (2000) note that individuals who have bicultural identities can engage in “frame switching” in which the individual can act more similarly to either culture, depending on the context. In fact, they find bicultural individuals primed with either of the cultures they identify with will act in a manner consistent with the primed culture. Similarly, several studies have found that expatriates working in a different country can adopt the cultural norms of the country in which they work (e.g., Bailey and Spicer 2007; Hu, Chand, and Evans 2013; Shin, Morgeson, and Campion 2007).

Hong et al. (2000) and Leung and Morris (2015) note that for an individual to behave consistent with one culture versus another, they must have an associated schema to adopt. While auditors may not have the schema necessary to “act more Chinese” or “act more American,”

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<sup>9</sup> We do not use the term “bias” to suggest that specific cultural mindsets represent a negative bias (i.e., a judgment flaw), but rather a directional tendency. Similarly, we do not suggest that all individuals in a given culture exhibit the same mindsets, but rather individuals from the respective cultures tend towards one versus the other on average.

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individuals from both countries possess the holistic and analytic schema needed to think more similarly, even though each culture tends to use one mindset more than the other. In fact, Spina, Ji, Guo, Zhang, Li, and Fabrigar (2010) demonstrate individuals can be primed to reason more holistically. In sum, individuals from both countries already possess the required holistic and analytic schema needed to think more similarly, even if they are unaware of their tendency towards each mindset. Accordingly, we predict that explicitly instructing Chinese and U.S. auditors to engage in both a holistic and an analytic mindset approach before evaluating information will lead the auditors to focus on a similar information set, reducing cross-cultural judgment differences between Chinese and U.S. auditors.

While we expect Chinese and U.S. auditors' judgments to converge as a result of the intervention, this does not necessarily mean the intervention will affect auditors from each country to the same extent. Specifically, since Chinese auditors tend to take a balanced, holistic approach to confirming and disconfirming information, instructing them to consider both a holistic and an analytic approach should shift them towards an analytic approach, increasing their attention to the salient subset of disconfirming information and resulting in more skeptical judgments compared to Chinese auditors who do not receive the intervention. Given the PCAOB's concerns about Chinese auditors' insufficient skepticism (PCAOB 2011), such an effect would suggest a benefit of the proposed intervention in enhancing professional skepticism for Chinese auditors. In contrast, since U.S. auditors tend to engage in an analytic approach and focus on a subset of disconfirming information, instructing them to consider both a holistic and

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an analytic approach might shift their attention to a more balanced approach. However, given the strict regulatory environment as well as the high litigation risk in the U.S., it is unlikely such an intervention would cause U.S. auditors to shift their attention away from disconfirming information. Further, while prior audit research shows certain mindset interventions are more effective than others, none of the mindset interventions tested in prior research *reduce* auditors' professional skepticism compared to auditors who do not receive a mindset intervention (Backof et al. 2018; Griffith, Hammersley, Kadous, and Young 2015; Rasso 2015). Accordingly, we expect that the U.S. auditors who receive the proposed intervention will not make less skeptical judgments compared to U.S. auditors who do not receive the intervention.

In summary, we predict that: (1) without the intervention, Chinese auditors will make less skeptical judgments than U.S. auditors; (2) with the intervention, Chinese auditors will make skeptical judgments that are similar to U.S. auditors; (3) Chinese auditors who receive the intervention will make more skeptical judgments than Chinese auditors who do not receive the intervention; and (4) U.S. auditors who receive the intervention will not make less skeptical judgments than U.S. auditors who do not receive the intervention. Overall, these predictions suggest an ordinal interaction hypothesis as shown in Figure 1. Formally stated:

HYPOTHESIS 1. *Explicitly instructing auditors to engage in both a holistic and an analytic mindset approach will reduce differences in skeptical judgments between Chinese and U.S. auditors, primarily due to Chinese auditors providing more skeptical judgments with (versus without) the instruction, and not due to U.S. auditors providing less skeptical judgments with (versus without) the instruction.*

[INSERT FIGURE 1]

### 3. Method

#### *Participants*

Our participants were primarily senior-level auditors drawn from all the Big 4 firms in China and the U.S.<sup>10</sup> Seventy-six Chinese auditors and 76 U.S. auditors completed the study. We asked several post-experimental questions to make sure participants' cultural backgrounds were consistent with the nation in which they worked. Two Chinese auditors indicated they were from a "Western (e.g., American or European)" cultural background, while seven U.S. auditors indicated they were from an "Eastern (e.g., Asian)" cultural background. We removed these culture-inconsistent participants. We expected U.S. auditors to be more heterogeneous, so it is unsurprising that more U.S. participants were removed as compared to Chinese participants. Additionally, we identified and removed 11 Chinese participants and 6 U.S. participants who were time outliers.<sup>11</sup> Our final sample included 63 Chinese auditors and 63 U.S. auditors. The

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<sup>10</sup> Fourteen participants were audit managers. Statistical inferences are unchanged when we exclude manager-level participants. Accordingly, we retain these participants in the sample.

<sup>11</sup> Time outliers were identified using a common approach of identifying data points outside the inner fence boundary (i.e., adding 1.5 times the interquartile range to the 3<sup>rd</sup> quartile, or upper hinge, see Myers and Well 2003). Participants who took excessive time to finish our experiment likely were distracted or interrupted while completing the study (e.g., Meade and Craig 2012). Consistent with this, results are qualitatively similar but less significant when we include these time outliers in the sample.

Chinese participants had an average of 4.16 years' experience (range 2 – 8) and 67.2 percent were female. The U.S. participants had an average of 3.92 years' experience (range 2 – 10) and 46.7 percent were female.<sup>12</sup>

In China, we recruited participants through one researcher's personal contacts in Big 4 firms, who helped recruit senior-level auditors in their offices. In order to obtain an adequate number of Chinese participants, we offered compensation of 100 RMB to each participant (approximately \$15.87 at the time) as payment for participation.<sup>13</sup> In the U.S., we recruited participants with the assistance of the Center for Audit Quality. U.S. auditors participated at their firm's direct request and we were prohibited from offering compensation to participants obtained through the Center for Audit Quality. We have no theoretical reasons to expect compensation differences would interact with our predictions. However, to address concerns that different compensation structures could potentially induce different effort levels, we asked participants to indicate their effort level in response to the question, "How hard do you feel you worked on this task?" using an 11-point scale anchored with 0 = "I didn't work hard at all on this task" and 10 = "I worked extremely hard on this task."<sup>14</sup> We find effort levels did not differ between Chinese

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<sup>12</sup> Gender and experience are not significant covariates.

<sup>13</sup> Adjusting for cost of living between major cities where many of the participants were located, this would be equivalent to paying approximately \$26 per participant in the U.S. (Numbeo.com 2017).

<sup>14</sup> Prior research has found that people from different cultures may interpret Likert scale labels differently and may vary on willingness to choose extreme values on small scales (e.g., five or fewer points). Based on previous research on how to avoid these issues, Minkov and Hofstede (2012) recommend labeling only the endpoints and using larger scales (of at least 7 points). We followed Minkov and Hofstede's (2012) recommendations and labeled only the endpoints and used an 11-point scale to minimize the risk that participants from China and the U.S. would interpret the scales differently. We also followed these recommendations for other measures in our experimental instrument.

auditors ( $M = 5.59$ ,  $s.d. = 2.39$ ) and U.S. auditors ( $M = 5.35$ ,  $s.d. = 2.16$ ) ( $F_{1,125} = 0.32$ ,  $p = 0.576$ ).<sup>15</sup> Accordingly, different incentive structures do not appear to affect effort level.<sup>16</sup>

### *Experimental Design*

To test our hypothesis, we conducted an experiment with a  $2 \times 2$  between-participants design. The first factor was the auditor's nation (China versus U.S.) and the second factor was the presence or absence of an intervention aimed at encouraging auditors to use both a holistic and an analytic mindset approach (intervention versus control). The intervention is presented in Exhibit 1. In the intervention condition, we asked participants to assume they attended a training session in which the trainer explained the key differences between holistic and analytic mindsets.<sup>17</sup> The intervention ends with the statement: "The trainer stressed that there is value for an auditor to consider BOTH a holistic approach AND an analytic approach in an audit

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<sup>15</sup> All reported p-values are two-tailed unless specified otherwise.

<sup>16</sup> The purpose of the compensation to Chinese participants was to encourage participation and not effort (i.e., payment was the same regardless of effort level). Further, even if there were concerns this might induce different effort levels, Kachelmeier and Shehata (1992) find only high monetary incentives have an impact on performance. In fact, they find no difference between low performance incentives and no performance incentives. Our payment amount is similar to their low incentive payment amounts (adjusted to current dollars).

<sup>17</sup> We do not discuss the fact that individuals from Western nations tend to use an analytic approach and East Asians tend to use a holistic approach. First, we did not want to bias participants' behavior towards a particular approach. Second, during pilot testing we found some participants had an aversive reaction to being told they thought in a certain manner, consistent with the argument that this represents an unconscious bias.

setting.”<sup>18</sup> Participants in the control condition saw no discussion of holistic or analytic mindsets and we did not provide instructions on which mindset they should use to approach the tasks.<sup>19</sup>

[INSERT EXHIBIT 1]

### ***Experimental Procedure***

We conducted the study online using the Qualtrics survey platform.<sup>20</sup> Participants accessed our study through a hyperlink and were randomly assigned to the control or intervention condition. In order to reinforce our intervention, we had participants respond to an image-based psychological task adapted from Masuda and Nisbett (2001).<sup>21</sup> Then, participants began working on two audit tasks as auditors of MTI Innovations, Inc. (“MTI” or “the

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<sup>18</sup> We do not separately ask participants to take either a holistic or analytic approach because it would be difficult to identify in advance whether a holistic or analytic approach is better for a given situation or to identify a particular individual’s *a priori* tendency towards analytic or holistic thinking (as noted earlier, not all U.S. and Chinese individuals will be more analytic versus more holistic. Rather, it is a directional tendency for each nation on average).

<sup>19</sup> We propose an explicit instruction approach rather than a subtle mindset priming approach because an explicit intervention can be adapted into a practical tool international firms can use to reduce cross-national auditor judgment differences. Our use of explicit instructions could raise concerns that we are simply instructing individuals how to think, leading them to behave as instructed. However, while we inform participants about holistic and analytic mindsets, we do not instruct how this should affect their specific attention to information or their judgments, and we expect the intervention will impact Chinese and U.S. auditors differently.

<sup>20</sup> The study was conducted entirely in English, in both China and the U.S. All of the Chinese participants indicated that they can speak English and all but one responded that they work at least part of the time in English. Prior research suggests that having the Chinese participants work in English could lead them to behave more consistent with Westerners (Nisbett et al. 2001), potentially biasing against finding support for our hypothesis. Additionally, our contacts who helped us obtain participants from Chinese audit firms noted that some of their audit seniors had education experience outside China (e.g., in the U.S.). Experiencing training in a different country can lead to a reduction in cross-cultural judgment differences (e.g., Hu et al. 2013). Similar to the language issue, the presence of such participants potentially biases against finding support for our hypothesis.

<sup>21</sup> All participants, including those in the control condition, respond to this task, although only those in the intervention condition are reminded to take both a holistic and analytic approach.

Company”), a public company that develops electronic components.<sup>22</sup> We developed these audit tasks in consultation with a Big 4 national audit partner and the experimental instrument was reviewed by the national offices of all the Big 4 firms. These reviewers provided feedback on the understandability and realism of the experimental audit tasks, as well as the appropriateness of the tasks for senior-level auditors. After completing these tasks, we asked post-experimental questions, including perceived litigation risk and inspection risk, the perceived difficulty of each task, and the auditors’ perceptions of the Company and its management. We then asked various demographic questions and, finally, participants self-assessed their effort level.

### *Dependent Variable*

To test Hypothesis 1, we asked participants to make a fair value judgment related to potential goodwill impairment for MTI’s subsidiary, XYZ Company (hereafter, “the goodwill impairment task”). Specifically, we asked them to evaluate the long-term earnings growth rate that the client used in their fair value calculation.<sup>23, 24</sup> Participants were informed that MTI’s

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<sup>22</sup> One audit task was designed to test Hypothesis 1, while the other task was designed to explore a related research question, which we discuss only as a supplemental task in Section 4.

<sup>23</sup> While this represents only one decision in a much more involved process of developing an independent valuation, the long-term earnings growth rate is a key input for which the core audit team provides a judgment, as opposed to valuation specialists (Griffith, Hammersley, and Kadous 2015). Glover, Taylor, and Wu (2017) note that the audit team and management commonly disagree over key assumptions in valuation models, while Christensen, Glover, and Wood (2012) demonstrate that small changes in valuation inputs can result in estimation changes that are many times traditional materiality levels. Accordingly, the judgment in our experimental context can have a material impact on financial reporting.

<sup>24</sup> While Chinese auditors typically work within standards that are substantially converged with IFRS and U.S. auditors typically work within U.S. GAAP, the procedures for the long-term earnings growth rate estimate would be similar under either set of rules. This is consistent with the approach taken by Agoglia, Douppnik, and Tsakumis (2011) who compare decisions made under different standards while holding constant the nature of the decision. To reduce the impact of separate standards, we make no reference in the experimental instrument to the related accounting rules that should govern participants’ judgments.



management has taken a position of a 7 percent long-term earnings growth rate. Participants then received five facts suggesting a higher long-term earnings growth rate that confirms management's estimate, and five facts suggesting a lower long-term earnings growth rate that disconfirms management's estimate.<sup>25</sup> These facts indicate an uncertain range for the long-term earnings growth rate between 1 percent and 9 percent, meaning management's 7 percent estimate is at the aggressive end of the range. At this point, we asked participants, "In your judgment, how much should the long-term earnings growth rate be?" on a scale from 1 percent to 9 percent. A higher estimate represents a less skeptical judgment. Finally, we asked participants to describe the factors in the case that affected their decision. As described more fully in the next section, we used this response to measure auditors' attention to information.

#### **4. Results**

##### *Test of Hypothesis*

##### *Mindset Intervention Check*

Prior to completing the auditing tasks, we asked the auditors to complete a task adapted from the psychology literature (Masuda and Nisbett 2001). The purpose of this task was to verify that the intervention operates through a shift in mindset approach compared to the control condition. If the mindset intervention was successful, we would expect to see Chinese auditors in

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<sup>25</sup> We counterbalanced the order of whether the confirming or disconfirming information set was presented first to rule out potential cultural differences in primacy or recency effects. There were no significant order effects. Accordingly, we do not discuss this further. We do not counterbalance audit task order because the effect of task order was not of interest to our theory. Participants completed the goodwill impairment task (our test of Hypothesis 1) after the other auditing task, resulting in a more conservative test for Hypothesis 1 as the impact of our mindset intervention manipulation could get weaker due to potential participant fatigue, biasing against finding results.

the intervention condition become more analytic compared to Chinese auditors in the control condition, while U.S. auditors in the intervention condition would become more holistic compared to U.S. auditors in the control condition.<sup>26</sup> In this task, we showed auditors an aquatic scene and asked them to describe the scene from memory. We analyzed auditors' recall of salient objects (representing an analytic approach) versus the field (representing a holistic approach).<sup>27</sup> The salient objects were coded in two categories: "focal fish" (fish in the front of the picture) and "other active objects" (other animals in the picture, including smaller fish and a frog). The field also included two categories: "inert objects" (e.g., plants) and "background and environment" (i.e., descriptions of the background or the overall environment). From this coding, we constructed net measures of attention to analytic versus holistic items by taking the difference between the number of certain salient objects recalled and the number of references to the background and environment.<sup>28</sup>

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<sup>26</sup> Although we do not expect U.S. auditors to become less skeptical in the goodwill impairment task due to the strict U.S. institutional environment, we expect that the intervention should impact U.S. auditors' mindset in a psychological (i.e., non-audit) task. Accordingly, this task provides support for our theory regarding how the mindset intervention operates.

<sup>27</sup> Two independent coders who were blind to condition and our hypothesis used a coding guide developed by Masuda and Nisbett (2001) to code attention to salient objects versus the field. Cohen's kappa was 0.821, which is generally considered an excellent level of inter-rater reliability (Neuendorf 2002). After completing their initial coding, the two coders met and reconciled all remaining differences without dispute. All analysis is based on the reconciled coding.

<sup>28</sup> The net measure of attention to analytic versus holistic items for the Chinese auditors was measured based on the difference between documented recall of the focal fish versus the background and environment while the net measure for the U.S. auditors was the difference between documented recall of the other active objects (i.e., other fish and a frog) versus the background and environment. We used these slightly different attention measures since the analytic categories that the Chinese and U.S. auditors attended to differed slightly. However, both measures represent comparison of an analytic coding category (the focal fish or other active objects) versus a holistic coding category (the background and environment). The excluded categories (i.e., inert objects for all auditors, focal fish for U.S. auditors, and other active objects for Chinese auditors) had no statistical differences between the intervention and control conditions.

Consistent with our expectations, we find the Chinese auditors in the intervention condition became significantly more analytic compared to the Chinese auditors in the control condition ( $t_{61} = 1.89, p = 0.032$ , one-tailed, untabulated), while the U.S. auditors in the intervention condition became significantly more holistic compared to the U.S. auditors in the control condition ( $t_{61} = -2.76, p = 0.004$ , one-tailed, untabulated). Together, these results suggest our intervention was successful at shifting attention in the predicted directions for both the Chinese and U.S. auditors in a non-audit setting.

### *Skeptical Judgments*

In Hypothesis 1, we predict that, in the control condition, Chinese auditors will make less skeptical judgments than U.S. auditors, and such a difference will be minimized in the intervention condition. Additionally, we expect that Chinese auditors in the intervention condition will make more skeptical judgments than Chinese auditors in the control condition, and that U.S. auditors in the intervention condition will not make less skeptical judgments than U.S. auditors in the control condition (see Figure 1 for a summary of predictions). To test this hypothesis, we analyze participants' judgments regarding the appropriate long-term earnings growth rate for the valuation of the subsidiary's goodwill. As noted earlier, participants chose an appropriate long-term earnings growth rate on a nine-point scale ranging from 1 percent to 9 percent. A lower response represents a more skeptical judgment. Results are tabulated in Table 1 and presented graphically in Figure 2. As shown in Table 1, Panel A, Chinese auditors in the control condition provided a mean long-term earnings growth rate of 5.78 (s.d. = 2.00), while

U.S. auditors in the control condition provided a mean long-term earnings growth rate of 4.66 (s.d. = 1.75). In the intervention condition, Chinese auditors' mean long-term earnings growth rate was 4.87 (s.d. = 2.01) while U.S. auditors' mean long-term earnings growth rate was 5.06 (s.d. = 1.50).

[INSERT TABLE 1 AND FIGURE 2]

We conduct an analysis of variance with country (China versus U.S.) and intervention (control versus intervention) as independent variables and participants' long-term earnings growth rate judgment as the dependent variable. We find a significant interaction of country and intervention ( $F_{1,122} = 4.09, p = 0.023$ , one-tailed equivalent). Since our theory predicts an ordinal interaction, we test Hypothesis 1 using a contrast test following Guggenmos, Piercey and Agolia (2018) with the contrast weights of +3 for Chinese auditors in the control condition and -1 for each of the remaining cells.<sup>29</sup> We first evaluate Figure 2 and determine that the pattern of means suggests visual fit similar to the predicted ordinal interaction. Next, as detailed in Table 1, Panel C, we find that the contrast test is significant ( $F_{1,122} = 6.01, p = 0.008$ , one-tailed equivalent) and the residual between-cells variance is non-significant ( $F_{2,122} = 0.36, p = 0.698$ ). Finally, we calculate the contrast variance residual ( $q^2$ ) which indicates that the contrast weights

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<sup>29</sup> As noted earlier, a higher long-term earnings growth rate indicates a lower level of skepticism. Since we predict Chinese auditors in the control condition will exhibit the lowest skepticism, we assign the highest weight (+3) for their estimates of the long-term earnings growth rate. We assign -1 to each of the remaining cells based on our Hypothesis 1 expectations that the Chinese auditors in the intervention condition will make skeptical judgments similar to the more skeptical U.S. auditors, while the U.S. auditors are not expected to differ between the control and intervention conditions (Figure 1).

explain all but 11.7% of the between-cells variance. Together, these tests provide convergent evidence consistent with the predicted ordinal interaction.

In Table 1, Panel C, we also present follow-up simple effects tests of auditors' skeptical judgments on the long-term earnings growth rate to confirm each aspect of the ordinal interaction predicted in Hypothesis 1. The simple effect of country within the control condition shows that, absent intervention, the Chinese auditors were less skeptical than the U.S. auditors ( $F_{1,122} = 6.06$ ,  $p = 0.008$ , one-tailed equivalent). The simple effect of country within the intervention condition then shows that Chinese and U.S. auditors who received the mindset intervention did not differ in their skeptical judgments ( $F_{1,122} = 0.17$ ,  $p = 0.678$ ).<sup>30</sup> This reduction in judgment differences between Chinese and U.S. auditors is statistically driven by the Chinese auditors. Specifically, the Chinese auditors' judgments become more skeptical in the intervention condition compared to the control condition ( $F_{1,122} = 3.90$ ,  $p = 0.026$ , one-tailed equivalent), while the U.S. auditors' judgments are not statistically different between the intervention and control conditions ( $F_{1,122} = 0.79$ ,  $p = 0.377$ ). These results are consistent with Hypothesis 1 and suggest that the proposed intervention has the benefit of enhancing Chinese auditors' skepticism without sacrificing U.S. auditors' skepticism, as well as reducing cross-national judgment differences between Chinese and U.S. auditors.

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<sup>30</sup> We also note that our intervention does not impact variance across cells. Specifically, Levene's test of equality of variances indicates no differences in variance across conditions ( $p = 0.222$ , see Table 1). This is important because there can be value to varying approaches within an audit team (e.g., having a variety of opinions and viewpoints may prevent groupthink; see Bonner 2008). However, our results suggest the intervention is not reducing variability, but rather is shifting means across cultures to improve cross-national auditor judgment comparability.

### *Attention to Information*

In our hypothesis development, we suggested that different cultural mindsets affect auditors' attention to information. To investigate the information attended to by the auditors, we asked them to describe the factors that affected their long-term earnings growth rate judgment. These responses were coded by two independent coders blind to condition and our hypothesis. The coders identified both the specific items documented by the auditors and the valence of the documented items (i.e., confirming versus disconfirming).<sup>31</sup> We then constructed a net measure of attention to evidence by subtracting the number of disconfirming items documented from the number of confirming items documented (hereafter, "net valence").<sup>32</sup> Results for net valence are presented in Table 2 and the means are presented graphically in Figure 3.

[INSERT TABLE 2 AND FIGURE 3]

As shown in Table 2 and Figure 3, the Chinese auditors' mean net valence in the control condition is  $-0.03$  (s.d. = 1.15), which is not statistically different from zero ( $t_{31} = -0.15$ ,  $p = 0.879$ , untabulated), suggesting the Chinese auditors attended equally to confirming and disconfirming items, consistent with a holistic mindset approach. In the intervention condition, the mean net valence of the Chinese auditors shifts to  $-0.65$  (s.d. = 1.36), indicating greater focus

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<sup>31</sup> We analyze the valence as documented by the participants, not necessarily the original valence in the experimental materials, because this represents how the participant perceived the item. There were many instances in which participants documented an item that had a disconfirming aspect in the case, but they documented only a confirming aspect of the item. In fact, analyzing the underlying processes by using the original valence of the item rather than the documented valence results in no significant process measures, supporting the idea that the manner in which participants documented the valence represents how they perceived the valence.

<sup>32</sup> Inter-rater reliability for this net measure was determined using Krippendorff's alpha which, unlike Cohen's kappa, can be used for an interval measure. Krippendorff's alpha was 0.743, which is generally considered a good level of reliability (Neuendorf 2002).

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on disconfirming items as compared to the control condition ( $F_{1,122} = 4.10, p = 0.023$ , one-tailed equivalent), consistent with a shift towards an analytic mindset approach.<sup>33</sup> Following procedures recommended by Hayes (2013), we find an indirect effect of the intervention on Chinese auditors' judgments through net valence (a 90 percent bias-corrected bootstrap confidence interval is in the predicted direction and excludes zero). This mediation analysis suggests that Chinese auditors who received the intervention paid more attention to disconfirming information as compared to Chinese auditors in the control condition, and this shift in focus leads to more skeptical judgments. When accounting for the indirect effect, the direct effect is not significant (the 90 percent bias-corrected bootstrap confidence interval includes zero), indicating mediation of the significant total effect of the intervention on the Chinese auditors' long-term earnings growth rate judgments.

In contrast, the U.S. auditors begin with a mean net valence in the control condition of  $-0.31$  (s.d. = 0.93), meaning the number of disconfirming items exceeds the number of confirming items (the mean is statistically less than zero,  $t_{31} = -1.90, p = 0.034$ , one-tailed, untabulated), consistent with an analytic mindset approach. The U.S. auditors' mean net valence in the intervention condition is  $-0.48$  (s.d. = 1.34), which is statistically unchanged from the control condition ( $F_{1,122} = 0.32, p = 0.573$ ), consistent with the fact that the U.S. auditors' long-term earnings growth rate judgments did not statistically change as a result of the intervention.

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<sup>33</sup> Importantly, the Chinese auditors do not differ in the total number of items documented in the control condition versus the intervention condition ( $F_{1,122} = 0.04, p = 0.841$ , untabulated), meaning the intervention operates by shifting Chinese auditors' attention to a different type of information, rather than through an increase in the number of overall items documented.

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These results are consistent with our contention that the strict institutional environment prevents U.S. auditors from becoming less skeptical in response to the mindset intervention.

*Exclusion of Alternative Explanations*

We included several post-experimental measures to rule out alternative explanations regarding how the intervention operates. To rule out the possibility that the intervention caused Chinese participants to change their perceptions of the institutional environment, we asked participants the likelihood that this audit engagement would be subject to litigation (to capture litigation risk) and the likelihood that the engagement would be selected for inspection by regulators (to capture inspection risk). Neither of these measures was impacted by the intervention, indicating that the intervention did not cause changes in perceptions of litigation risk or inspection risk. Further, results for auditors' skeptical judgments and attention to information are statistically unchanged when controlling for litigation risk and/or inspection risk as covariates.

Additionally, we asked participants their level of agreement with the statement, "I would feel comfortable challenging management on their estimate of the earnings growth rate." The purpose of this measure was to determine whether the intervention operates through decreasing Chinese auditors' deference to management (i.e., power distance). We find the intervention had no impact on willingness to challenge management. Further, including this measure as a covariate does not change the statistical inferences for our Hypothesis 1 results. In summary, we



can conclude that our Hypothesis 1 results are robust after controlling for litigation risk, inspection risk, and power distance, excluding these alternative explanations.

### *Expert Panel Judgments and Interviews*

A reasonable question arising from our results is whether the outcome in the goodwill impairment task represents the optimal outcome. Specifically, is it optimal that the Chinese auditors in our intervention condition were more skeptical than the Chinese auditors in the control condition, matching the U.S. auditors who remained equally skeptical in both conditions? To address this question, we interviewed six audit partners from three international firms, as well as one national-level senior manager from one of those firms.<sup>34</sup> These individuals all have extensive experience with multinational audits. Importantly, they all have significant experience working with Chinese auditors in Asia, including mainland China and special administrative regions such as Hong Kong and Macau. All seven interviewees are U.S.-based. The interviewees' mean audit experience was 22 years, ranging from 13 to 35 years.

Prior to conducting these interviews, we provided each interviewee with the goodwill impairment case from the main experiment and asked them for their judgments on the long-term earnings growth rate. The purpose was to provide a context for the discussion of our main study results, as well as to obtain an expert panel judgment. The mean response was 4.86. With this expert panel estimate as the benchmark, we find the mean estimate of all U.S. auditors in our experiment (4.86) is identical to the consensus expert estimate, suggesting the U.S. senior

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<sup>34</sup> The senior manager has extensive experience on multinational engagements and consults on many of the most significant and high-risk Chinese engagements for that particular firm.

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auditors' judgments are of high quality. Additionally, as noted earlier, while the U.S. auditors' estimates are not statistically different between the control and intervention conditions, the mindset intervention moves the Chinese auditors' mean estimates from 5.78 in the control condition to 4.87 in the intervention condition, which is essentially equivalent to the consensus expert estimate (4.86), suggesting the mindset intervention enhances the quality of Chinese auditors' judgments.

We then conducted the interviews following a predetermined interview script, but allowing for open discussion. To ensure consistency in the interview approach, one of the researchers conducted all of the interviews. For the first question, we informed each interviewee that "Country A" had a higher estimate for the long-term earnings growth rate than "Country B," and we asked which judgment better promoted audit quality.<sup>35</sup> Five of the seven interviewees felt the lower estimate represented higher audit quality. The remaining two interviewees expressed uncertainty, noting that it depends on the situation and they would need more information. Regardless of the optimal outcome, all the interviewees felt it is important that auditors from different countries make similar judgments given identical facts. Five of the seven interviewees noted that the importance of consensus assumed similar judgment frameworks (e.g., reporting standards, auditing standards, firm guidance), but all seven acknowledged that even if GAAP and

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<sup>35</sup> In order to prevent biasing the interviewees' opinions of the optimal outcome, we did not tell the interviewees the purpose of our study, nor did we provide specific information about our findings until the end of the interviews. This included withholding the actual means from the main study. We also did not inform the interviewees which country's auditors were less skeptical. Instead, we simply referred to Country A and Country B. In this way, we expected the interviewees would not be influenced by either their own judgment in the case study or by home bias (i.e., bias towards the U.S. outcome).

IFRS converge, there will still be cross-national judgment differences, particularly in a principles-based environment. However, several noted GAAP requires considerable judgment, meaning cross-national judgment differences can have an impact, even in a more rules-based framework.

We next asked the interviewees what kind of problems could arise from cross-national judgment differences, especially in a multinational audit setting. All the interviewees felt consistent cross-national judgments are important for several reasons. For example, one interviewee said, “The judgment should be fairly consistent. Otherwise, it would not be a fair presentation to the financial report user.” A couple interviewees also mentioned the importance of audit judgment consistency for financial reporting comparability, with one stating, “I think that inconsistency means we’re gravitating away from what we actually want the financial statements to look like. From a comparability perspective between segments, that is probably your biggest thing.”<sup>36</sup> Another interviewee noted that inconsistent judgments could be a risk issue for audit firms.

In summary, the interviewees provided an expert panel judgment of the long-term earnings growth rate comparable to the U.S. consensus judgment in our study, suggesting the U.S. senior auditors’ judgments in our experiment are of high quality. Moreover, given our intervention moves the Chinese auditors’ judgments closer not only to the U.S. auditors’ judgments in the experiment but also the consensus expert panel judgment, these results suggest

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<sup>36</sup> We have edited some of the quotes for clarity.

our intervention improves Chinese auditors' judgment quality. Importantly, the interviewees all believed without reservation that auditors given identical facts and judgment frameworks should make similar judgments, demonstrating the importance of improving auditor judgment consistency.<sup>37</sup>

### *Supplemental Task*

As discussed earlier, we expect that, absent intervention, U.S. auditors focus on disconfirming information, while Chinese auditors take a more balanced approach to confirming and disconfirming information. That said, an analytic mindset may cause U.S. auditors to focus on other salient and relevant subsets of information. For instance, auditing standards require auditors to consider both the entity and its environment (e.g., industry and overall economic information) (e.g., AS 2110; IAS 315). However, because cultural psychology research finds individuals from the U.S. are more likely to focus on the details of objects (e.g., the entity) as opposed to relating objects to the overall field (e.g., the environment) (Nisbett et al. 2001), we expect U.S. auditors to focus more on a subset of entity-specific information relative to environmental information. In contrast, we expect Chinese auditors will take a more balanced, integrative approach and consider information about the entity and its environment.

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<sup>37</sup> At the end of each interview, we described the intervention proposed in our study, along with a description of the results. All the interviewees expressed interest in the implications of our findings. Further, in a follow-up conversation, we spoke with an additional national-level Big 4 audit partner who said that, while their firm currently discusses cultural issues during training, they were not previously aware of the impact of cultural mindsets. This partner stated that the firm would be interested in knowing more details and could potentially consider including discussion of cultural mindsets in their training, especially for auditors involved in multinational group audits. Other comments from the interviewees confirmed the presence of global training coordination in their firms, consistent with Sunderland and Trompeter (2017). Such global coordination would allow international audit firms to adapt our findings into their training.

In our primary task (i.e., the goodwill impairment task), the disconfirming information is entity-specific, while the confirming information is environmental. When disconfirming and entity-specific information are aligned, it is clear U.S. auditors will focus on a subset of disconfirming, entity-specific information relative to a subset of confirming, environmental information, while Chinese auditors will take a more balanced approach to all available information, as evidenced by the results of our goodwill impairment task. However, it is unclear which information subset the U.S. auditors will focus on when disconfirming and entity-specific information are not aligned. Therefore, we included an additional audit task in which entity-specific information is confirming and environmental information is disconfirming. If U.S. auditors primarily focus on disconfirming information, they would pay more attention to the subset of disconfirming, environmental information. In contrast, if U.S. auditors primarily focus on entity-specific information, they would pay more attention to the subset of confirming, entity-specific information. Alternatively, if U.S. auditors focus equally on both disconfirming information and entity-specific information, they would pay attention to both information subsets, resulting in a balanced approach similar to Chinese auditors.

To investigate which information subset has a larger impact on U.S. auditors' judgments, we asked participants to provide an inventory obsolescence likelihood judgment based on a set of ten facts: five facts on "Information Regarding MTI's Product" that support the Company's position of no inventory obsolescence (i.e., confirming, entity-specific evidence), and five facts on "Information Regarding the Market" that suggest the presence of an inventory obsolescence

problem and, therefore, disconfirm the Company's position (i.e., disconfirming, environmental evidence).<sup>38</sup> We measure participants' inventory obsolescence judgments by asking them to indicate their level of agreement that an inventory obsolescence reserve is needed, on an 11-point scale ranging from 0 (Strongly Disagree) to 10 (Strongly Agree).

We present descriptive statistics and ANOVA results for the inventory obsolescence judgment in Table 3. Ultimately, we find no differences between Chinese and U.S. auditors for the inventory obsolescence judgment (i.e., the main effects and interaction term are non-significant in the ANOVA model in Panel B, smallest  $p = 0.494$ ).<sup>39</sup> Consistent with this, we also find no significant differences in the net valence of auditors' documented attention to information. Notably, the mean net valence for all participants was 0.06 (s.d. = 1.56), which is not statistically different from zero ( $t_{125} = 0.46$ ,  $p = 0.649$ , untabulated), meaning all participants attended equally to confirming and disconfirming evidence. These results suggest that U.S. auditors' analytic mindset approach leads them to focus equally on both subsets of information (i.e., the subset containing disconfirming information and the subset containing entity-specific

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<sup>38</sup> The fact pattern in this task was adapted from Saiewitz and Kida (2018), who developed their instrument based on facts used in several previous studies (e.g., Anderson, Jennings, Lowe, and Reckers 1997; Fanning and Piercey 2014). Consistent with the goodwill impairment task, we counterbalanced the order of confirming and disconfirming information to rule out cultural differences in primacy or recency effects. As with the goodwill impairment task, there were no significant order effects. Accordingly, we do not discuss this further.

<sup>39</sup> As noted earlier, participants completed this inventory obsolescence task before they completed the goodwill impairment task. Thus, it is unlikely that the insignificant results in the inventory obsolescence task are due to participant fatigue.

information), resulting in a balanced approach similar to Chinese auditors.<sup>40</sup> Importantly, the intervention did not *cause* differences in U.S. and Chinese auditors' judgments where differences did not previously exist, suggesting this intervention is unlikely to cause judgments to diverge when those judgments are similar absent intervention. Further, consistent with the goodwill impairment task, the intervention did not cause either party to become less skeptical.

[INSERT TABLE 3]

## 5. Discussion and Conclusion

As global multinational audits become more prevalent (Sunderland and Trompeter 2017) and as auditors from different countries make up a larger proportion of the U.S. audit industry (Jenkins and Calegari 2010; Nolder and Riley 2014), it is necessary to understand why auditors from different countries make different skeptical judgments and how to reduce such differences. Our study identifies cultural mindset as an important factor contributing to auditor judgment differences across nations, adding to previously documented factors such as different institutional environments and cultural values. Our results document that explicitly alerting auditors about the existence of analytic versus holistic mindsets and instructing them to consider both a holistic and an analytic mindset approach can effectively reduce judgment differences between Chinese and U.S. auditors. Mediation analysis suggests that this mindset intervention shifts Chinese auditors' attention from a balanced focus on confirming and disconfirming

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<sup>40</sup> While our intervention is designed to lead Chinese and U.S. auditors to think similarly, it does not affect auditor judgment in the inventory obsolescence task because, absent intervention, the Chinese and U.S. auditors already attend to the same set of information.

evidence to focusing more on the subset of disconfirming evidence. This, in turn, results in more skeptical judgments by Chinese auditors, making their judgments more comparable to U.S. auditors' judgments. In contrast, the U.S. participants do not become less skeptical as a result of the intervention, which suggests an added benefit of our intervention in that it not only reduces cross-national judgment differences, but also does not cause one party to become less skeptical. We summarize key findings, takeaways for research and practice, and future research opportunities in Table 4.

[INSERT TABLE 4]

Our study contributes to the audit literature by demonstrating how cross-cultural differences in cognitive processing can cause auditors' evaluative judgments to differ across nations. Prior research on evidence evaluation indicates that auditors assign different weights to each piece of information based on its relative strength, and then use this weighting to reach a final judgment (Bonner 2008; Koonce 1993). Prior studies focusing on U.S. auditors find auditors weight negative (i.e., disconfirming) information more heavily than positive (i.e., confirming) information (e.g., Knechel and Messier 1990), consistent with the U.S. auditors in our study. However, we demonstrate this prior research finding does not necessarily generalize to Chinese auditors who weight confirming and disconfirming information equally. This is consistent with Nolder and Blankenship's (2018) contention that certain psychological theories may not generalize across cultures. Accordingly, as Nolder and Riley (2014) note, auditing



researchers should consider whether prior findings in the auditing literature, as well as the psychology literature, generalize across nations in an increasingly globalized audit environment.

Importantly, our findings have implications for auditors, audit firms, and standard setters. Prior studies suggest that differences in auditor behavior exist across nations even when firms have placed an emphasis on global coordination of multinational audits and provide common audit guidance across nations (e.g., Bik and Hooghiemstra 2018). Consistent with this, Sunderland and Trompeter (2017) note that cultural differences are a source of concern in global multinational audits. Our study suggests such concerns are warranted, given we show cultural mindsets affect auditor judgments. Hence, when using the work of auditors with different cultural backgrounds, audit firms should be aware that judgment differences might exist due to cultural mindsets. The intervention proposed and examined in our study can be adapted and expanded for use in firm training and teaching agendas to reduce inconsistencies in professional judgments arising from different cultural mindsets. Standard setters in particular may be interested in this intervention because it not only reduces judgment differences for auditors with different cultural backgrounds, but also improves Chinese auditors' professional skepticism, helping to address concerns raised by standard setters and researchers about component auditor quality in global multinational audits (IAASB 2015; PCAOB 2016; Sunderland and Trompeter 2017), especially those related to Chinese financial reporting and auditing quality (PCAOB 2011; Schapiro 2011). Standard setters could consider including language in relevant auditing

standards encouraging auditors to consider both analytic and holistic mindset approaches to enhance the consistency of cross-national auditor judgments.

This study presents many additional avenues for future research. While our study establishes the influence of cultural mindsets on auditors' attention to information and skeptical judgments, future research can investigate whether cultural mindsets impact other judgment and decision making behavior of auditors, such as information search, reliance on consultants' advice, responses to workpaper review in a multinational audit setting, and communication between parent and component auditors on multinational engagements (cf. Downey and Bedard 2019). Further, while we find that our intervention reduces differences in cross-national auditor judgments, we note that differences in analytic and holistic mindsets represent just one example of cultural mindset differences. Researchers should investigate how other cognitive schemas impact auditor behavior across cultures. For example, Oyserman (2011) notes that Americans are more likely than non-Westerners to explain behavior based on individual dispositions rather than situational aspects. In an audit context, this might lead U.S. auditors to be more critical of management than non-Westerners when a misstatement is found and could lead to different conclusions about whether a misstatement is intentional (i.e. fraudulent) versus unintentional (i.e., an error). Importantly, future research should leverage knowledge of other cultural mindset differences to develop additional intervention mechanisms to improve cross-national auditor judgment comparability, as well as to improve auditor professional skepticism both within and across cultures. Finally, although we focus on Chinese and U.S. auditor judgments, prior

research suggests certain nations may “cluster” in terms of similar characteristics and behaviors (Ronen and Shenkar 2013). Accordingly, the implications of our study may extend to other East Asian nations, as well as other Western nations. Future research can investigate the broader generalizability of our findings. In summary, our study represents an important first step demonstrating how cultural mindsets can be leveraged to improve both the quality and comparability of cross-national auditor judgments and we encourage future research to help provide a richer understanding of the impact of mindsets across different cultures.

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## **EXHIBIT 1**

### Intervention Wording

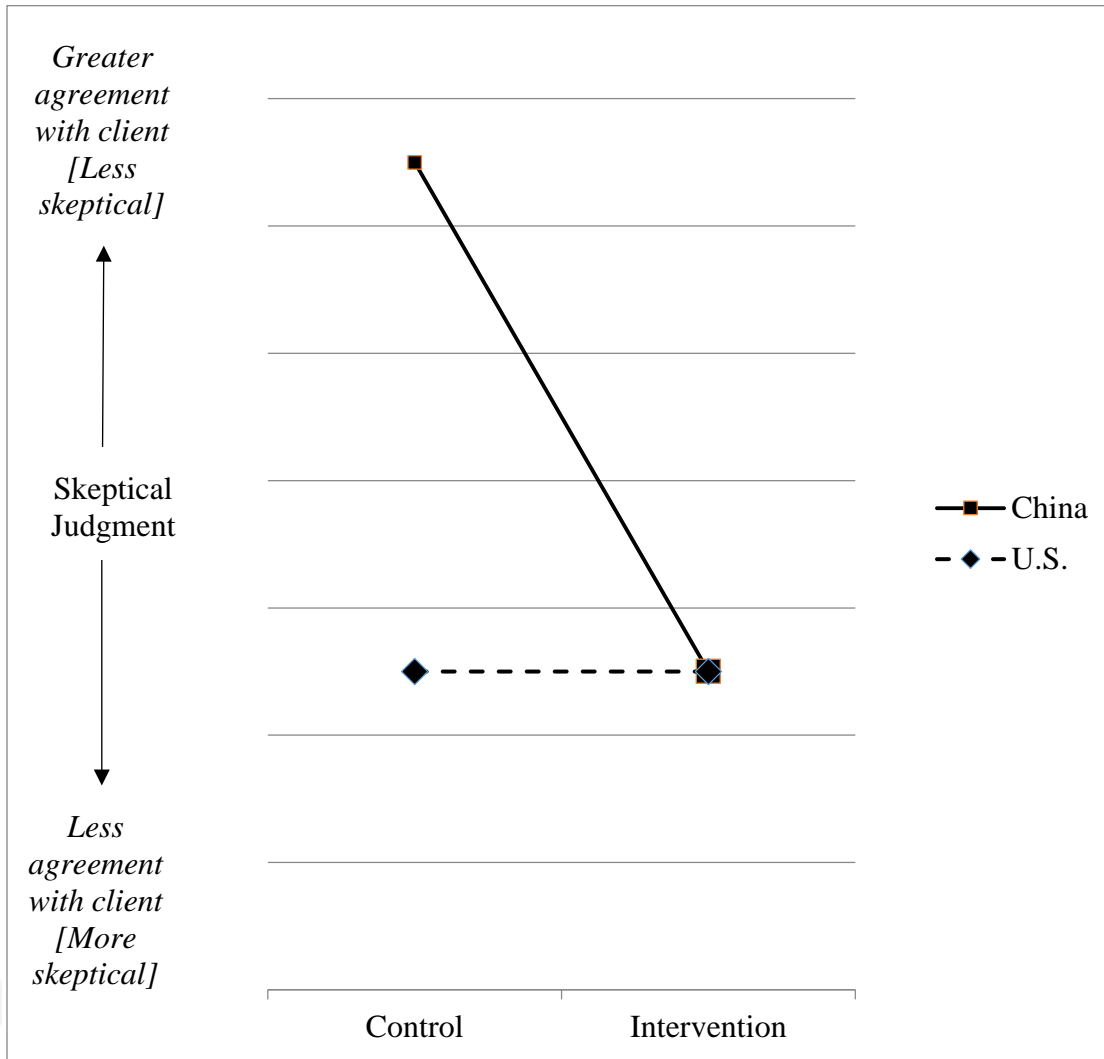
Please assume that you recently attended a training session. In this session, the trainer provided the following information:

Most people are unaware of the influence that “mindsets” can have on their decision making processes. For example, some people tend to engage in a “holistic” reasoning process whereas others tend to engage in a more “analytic” reasoning process.

In a holistic approach, a person is more likely to look at the “big picture.” They will focus on how an object relates to its environment, but they may not pay close attention to the attributes of the object itself. In contrast, in an analytic approach, a person will often be “detail-oriented,” meaning they will focus on the attributes of the object itself, but they may pay less attention to the object’s relationship with its environment.

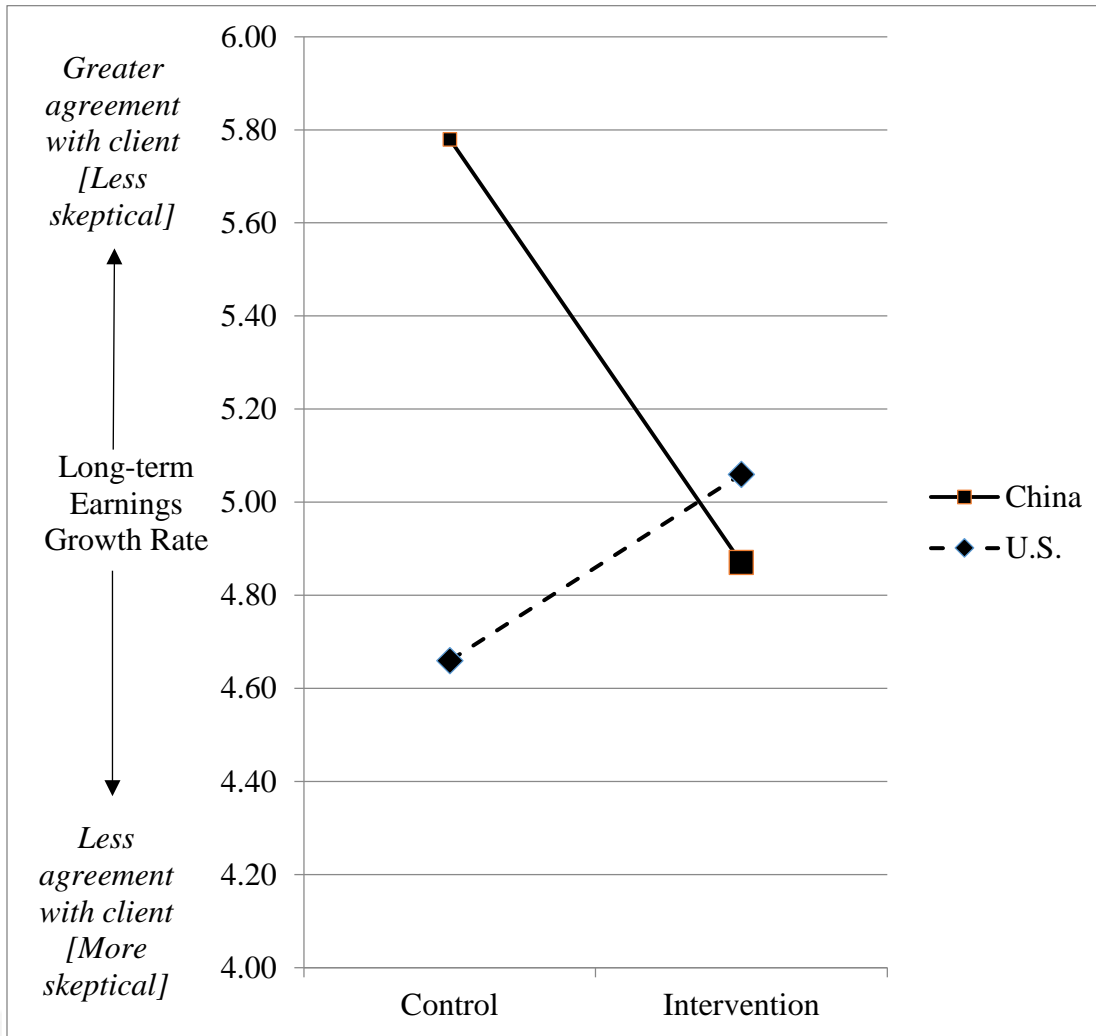
**The trainer stressed that there is value for an auditor to consider BOTH a holistic approach AND an analytic approach in an audit setting.**

**Figure 1** Ordinal Interaction Predicted in Hypothesis 1



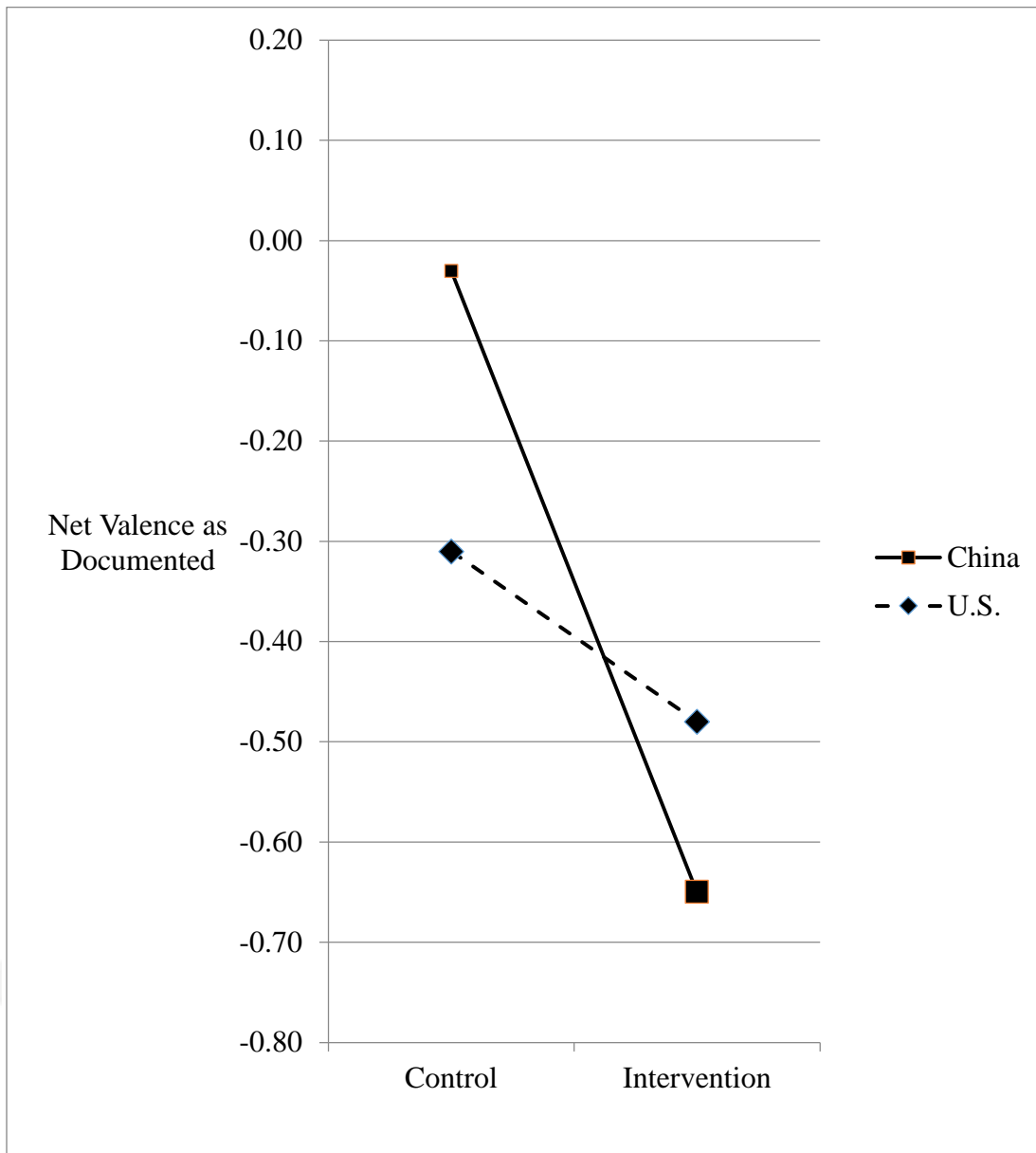
A less skeptical judgment is shown as “higher” for ease of comparison with the study results, in which a higher value equals greater agreement with client preferences and, therefore, a less skeptical judgment.

**Figure 2** Long-Term Earnings Growth Rate Judgment



Long-term earnings growth rate: These are mean responses to the question, “In your judgment, how much should the long-term earnings growth rate be? Please choose a number from 1% to 9%.” A lower value would result in a lower valuation and also represents less agreement with client preferences and, therefore, a more skeptical judgment.

**Figure 3** Net Valence of Items Documented for the Long-Term Earnings Growth Judgment



This is based on coders' analysis of responses to the request, "Please describe the factors in the case that affected your decision [on the estimated long-term growth rate]." Items were coded as confirming or disconfirming based on

the valence as documented by the participant. Net valence represents the net number of confirming items documented less the number of disconfirming items documented.

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TABLE 1

## Long-Term Earnings Growth Rate Judgment

**Panel A:** Descriptive statistics – Mean <sup>a</sup> (standard deviation) <sup>b</sup> [n]

	Control	Intervention	Row mean
China	5.78 (2.00) [32]	4.87 (2.01) [31]	5.33 (2.04) [63]
U.S.	4.66 (1.75) [32]	5.06 (1.50) [31]	4.86 (1.64) [63]
Column mean	5.22 (1.95) [64]	4.97 (1.77) [62]	5.10 (1.86) [126]

**Panel B:** ANOVA Results

	<u>df</u>	<u>Mean Square</u>	<u>F-statistic</u>	<u>p-value</u>
Main Effects				
Country <sup>c</sup>	1	6.831	2.042	0.078
Intervention	1	1.984	0.593	0.443
Two-way Interaction				
Country × Intervention <sup>c</sup>	1	13.688	4.092	0.023
Error	122	3.345		



**Panel C: Hypothesis Testing and Simple Effects Tests**

	<u>df</u>	<u>Mean Square</u>	<u>F-statistic</u>	<u>p-value</u>
<b>H1: Test for Predicted Ordinal Interaction (Figure 1):</b>				
Custom contrast test <sup>c, d</sup>	1	20.088	6.006	0.008
Residual between-cells variance	2	1.207	0.361	0.698
Contrast variance residual: $q^2 = 0.117$				
Simple effects of Country within the control condition <sup>c</sup>	1	20.250	6.055	0.008
Simple effects of Country within the intervention-present condition	1	0.581	0.174	0.678
Simple effects of intervention versus control for Chinese auditors <sup>c</sup>	1	13.047	3.901	0.026
Simple effects of intervention versus control for U.S. auditors	1	2.625	0.785	0.377

<sup>a</sup> These are mean responses to the question, “In your judgment, how much should the long-term earnings growth rate be? Please choose a number from 1% to 9%.” A lower value would result in a lower valuation and also represents less agreement with client preferences and, therefore, a more skeptical judgment.

<sup>b</sup> Levene's test of equality of variance indicates no difference in variances ( $p = 0.222$ ).

<sup>c</sup> This  $p$ -value is the one-tailed equivalent  $p$ -value for a directional hypothesis. An F statistic with one degree of freedom is equivalent to the squared ANOVA contrast t-statistic and results in the identical  $p$ -value (McNeil, Newman, and Kelly 1996).

<sup>d</sup> This is a custom contrast test to determine whether the Chinese auditors in the control condition significantly differ from all other cells. Weights are +3, -1, -1, -1, with the Chinese auditors in the control condition assigned the weight of +3. See Guggenmos et al. (2018) for detailed explanations of each test.

TABLE 2

Net Valence of Items Documented for the Long-Term Earnings Growth Rate Judgment

**Panel A:** Descriptive statistics – Mean <sup>a</sup> (standard deviation) <sup>b</sup> [n]

	Control	Intervention	Row mean
China	–0.03 (1.15) [32]	–0.65 (1.36) [31]	–0.33 (1.28) [63]
U.S.	–0.31 (0.93) [32]	–0.48 (1.34) [31]	–0.40 (1.14) [63]
Column mean	–0.17 (1.05) [64]	–0.56 (1.34) [62]	–0.37 (1.21) [126]

**Panel B:** ANOVA Results

	<u>df</u>	<u>Mean Square</u>	<u>F-statistic</u>	<u>p-value</u>
Main Effects				
Country	1	0.113	0.078	0.780
Intervention	1	4.855	3.352	0.070
Two-way Interaction				
Country × Intervention	1	1.542	1.065	0.304
Error	122	1.448		

**Panel C: Planned contrasts**

	<u>df</u>	<u>Mean Square</u>	<u>F-statistic</u>	<u>p-value</u>
Contrast of control versus intervention:				
Chinese <sup>c</sup>	1	5.934	4.098	0.023
U.S.	1	0.462	0.319	0.573

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<sup>a</sup> This is based on coders' analysis of responses to the request, "Please describe the factors in the case that affected your decision [on the estimated long-term growth rate]." Items were coded as confirming or disconfirming based on the valence as documented by the participant. Net valence represents the net number of confirming items documented less the number of disconfirming items documented.

<sup>b</sup> Levene's test of equality of variance indicated no differences in variance ( $p = 0.099$ ).

<sup>c</sup> This  $p$ -value is the one-tailed equivalent  $p$ -value for a directional hypothesis. An F statistic with one degree of freedom is equivalent to the squared ANOVA contrast t-statistic and results in the identical  $p$ -value (McNeil et al. 1996).

TABLE 3  
Inventory Obsolescence Judgment

**Panel A:** Descriptive statistics – Mean <sup>a</sup> (standard deviation) <sup>b</sup> [n]

	Control	Intervention	Row mean
China	5.53 (2.36) [32]	6.06 (2.28) [31]	5.79 (2.32) [63]
U.S.	5.78 (2.87) [32]	5.71 (2.33) [31]	5.75 (2.60) [63]
Column mean	5.66 (2.61) [64]	5.89 (2.29) [62]	5.77 (2.45) [126]

**Panel B:** ANOVA Results

	<u>df</u>	<u>Mean Square</u>	<u>F-statistic</u>	<u>p-value</u>
Main Effects				
Country	1	0.087	0.014	0.905
Intervention	1	1.678	0.275	0.601
Two-way Interaction				
Country × Intervention	1	2.880	0.471	0.494
Error	122	6.112		

<sup>a</sup> Participant responses to the statement, “On the following scale, please indicate how strongly you agree or disagree that an inventory reserve is needed,” on a scale anchored with 0 = Strongly DISAGREE that a reserve is needed and 10 = Strongly AGREE that a reserve is needed.

<sup>b</sup> Levene's test of equality of variance indicated no difference in variances ( $p = 0.345$ ).

Table 4

## Summary of Key Findings, Takeaways for Research and Practice, and Future Research Opportunities

Key Findings	<p>Chinese auditors engage in a holistic mindset approach, focusing on a balanced set of confirming and disconfirming evidence, whereas U.S. auditors use a more analytic mindset approach, focusing more on the subset of disconfirming information. As a result, Chinese auditors provide less skeptical judgments than U.S. auditors.</p> <p>An intervention instructing auditors to use <i>both</i> a holistic and an analytic mindset approach shifts Chinese auditors' attention towards disconfirming evidence, leading to judgments that are comparable to U.S. auditors' more skeptical judgments. In contrast, the intervention does <i>not</i> cause U.S. auditors to shift away from disconfirming evidence, likely due to the strong U.S. institutional environment (e.g., high regulatory risk, inspection risk, and litigation risk).</p>
Research Takeaways	<p>This study introduces cultural mindset theory to the auditing literature. Specifically, we demonstrate that cross-cultural differences in cognition impact auditors' evaluative judgments. Further, by applying a mindset intervention, we demonstrate that cultural mindsets can be changed. In doing so, we move auditing research away from the trait-based cultural values approach (e.g., Hofstede 1981, 2001) toward an approach that recognizes culture is malleable (see Leung and Morris 2015; Nolder and Riley 2014).</p> <p>Additionally, by demonstrating that a mindset intervention impacts auditors' professional skepticism, we provide evidence supporting Nolder and Kadous's (2018) professional skepticism model.</p>
Practice Takeaways	<p>Audit firms should be interested to know that Chinese auditors are not inherently less skeptical, rather they focus on different sets of evidence than U.S. auditors, resulting in less skeptical judgments.</p> <p>We introduce a practical intervention that audit firms can adapt for use in training sessions to help auditors gain awareness of their mindsets and improve their judgment quality, as well as to improve cross-national auditor judgment comparability on multinational group audits.</p>

Future Research Opportunities	Researchers should identify other auditor behaviors impacted by cultural mindset differences, as well as other types of cultural mindset differences, and should develop additional intervention mechanisms to improve cross-national auditor judgment quality and comparability. Finally, researchers should expand such studies to other countries to determine the most appropriate interventions to improve audit quality in specific countries.
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