

## **Auditors' Professional Skepticism: Traits, Behavioral Intentions, and Actions**

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### **ABSTRACT**

Auditors' professional skepticism is critical to applying auditing standards and achieving audit quality. Prior research provides measures of skepticism in general, and auditor-specific trait skepticism. Other research develops and tests a theoretical model of auditor professional skepticism, positing factors that contribute to skeptical intentions and skeptical actions. In this paper, we provide an empirical test of these measures and theories, examining individual differences and personality traits that affect trait-based professional skepticism, testing the associations between factors related to behavioral intentions toward skepticism, and revealing their collective association with skeptical actions. We use data from a sample of 663 auditors across all ranks from staff through partner who each completed an experiential questionnaire relating to one of their actual audit engagements. We find that individual differences (gender, experience, and knowledge) are associated with differential levels of professional trait skepticism, as are personality traits (agreeableness, conscientiousness, openness, narcissism and psychopathy). Advancing the Theory of Planned Behavior in an auditing context, the results reveal that trait skepticism is positively associated with attitudes, subjective norms, and perceived behavioral control over skepticism, which in turn affect auditors' intentions to act skeptically. Subjective norms are the strongest predictor of auditors' skeptical intentions. Further, attitudes, subjective norms, and perceived behavioral control are positively associated with skeptical actions with respect to evidence collection and evaluation, and intentions to act skeptically positively mediate these associations.

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### **I. INTRODUCTION**

Auditors' professional skepticism is critical to applying auditing standards and achieving audit quality (e.g., AFM 2014; PCAOB 2015; IAASB 2017), and a global recurring theme in audit inspection findings is that auditors struggle to appropriately apply skepticism in their judgments and decision making (PCAOB 2012; IAASB 2015; IFIAR 2015). Prior research provides measures of skepticism with respect to moral courage (Sekerka, Bagozzi, and Charnigo 2009), interpersonal trust (Rotter 1967; Wrightsman 1991) and auditor-specific trait skepticism (Hurtt 2010). Other research yields theoretical models of auditor professional skepticism, positing factors that contribute to skeptical intentions and skeptical actions (Nelson 2009; Hurtt et al. 2013; Nolder and Kadous 2018). The purpose of our study is to provide an empirical test of these measures and theories, examining individual differences and personality traits that affect trait-based professional skepticism, testing the associations between factors related to behavioral intentions toward skepticism, and revealing their collective association with skeptical actions with respect to evidence collection and evaluation on actual audit engagements in practice.

We integrate prior theories of auditor professional skepticism and the Theory of Planned Behavior (Ajzen 1991) to develop our own conceptual model, which we then use to inform our empirical analyses. Phase I of our model considers a host of individual differences (gender, experience, and knowledge) and personality traits ('Big 5' and Dark Triad indicators of personality) that may affect auditors' professional skepticism traits. Our model acknowledges a variety of perspectives on skepticism, including neutral (assuming neither honesty nor dishonesty on the part of management; see e.g., PCAOB AS 1015 para. .09), presumptive doubt (recognizing the possibility of management bias despite prior honesty and integrity; see e.g., ISA 240.24), and

the moral courage to take skeptical actions (see e.g., ISA 200, A21). Phase II advances the Theory of Planned Behavior (Ajzen 1991; Ajzen 2005; Ajzen 2012) in the context of auditor professional skepticism, thereby extending prior accounting research that employs that theory to study topics such as financial reporting fraud, tax compliance, career choices, and auditors' use of support systems (Bobek and Hatfield 2003; Buchan 2005; Carpenter and Reimers 2005; Dowling 2009; Bagley, Dalton, and Ortengren 2012; Dalton, Bucheit, and McMillan 2014). We hypothesize that trait-based professional skepticism is positively associated with attitudes about behaving skeptically, subjective norms (i.e., social pressure to behave skeptically), and perceived behavioral control over obstacles to behaving skeptically. The conceptual model then provides insights as to our expectations that these factors are each positively associated with both skeptical intentions and skeptical actions. In Phase III, the model acknowledges the importance of situational characteristics with respect to anticipating auditors' skeptical actions and enables us to hypothesize that auditors' skeptical intentions are positively associated with skeptical actions with respect to searching for evidence, questioning its veracity, and suspending judgment until evidence search and analysis concludes.

To conduct the study, we obtained our data via the Foundation for Auditing Research (FAR), which provided anonymized and transformed responses from six audit firms in the Netherlands, including two Big 4 and four non-Big 4 firms and 663 auditors across all ranks from staff through partner. Participants completed an experiential questionnaire (e.g., see Gibbins and Trotman 2002) about one of their actual audit engagements. We employ three measures of skepticism: the Hurtt Professional Skepticism scale (*HPS*; Hurtt 2010, which adopts a neutral perspective), the Professional Moral Courage scale (*PMC*; Sekerka et al. 2009), and Rotter's Interpersonal Trust scale (*RIT*; Rotter 1967; Wrightsman 1991, which adopts a presumptive doubt perspective). We

measure individual differences including gender, age/audit experience, and audit knowledge. We measure personality traits with respect to the ‘Big 5’ personality characteristics (i.e., extraversion, agreeableness, conscientiousness, emotional stability, and openness) and with respect to the Dark Triad (i.e., Machiavellianism, narcissism, and psychopathy) using validated measures (Jones and Paulhus 2002; Gosling, Rentfrow, and Swann 2003). Measures relating to the Theory of Planned Behavior include attitudes, subjective norms (social pressure around skepticism), perceived behavioral control (obstacles auditors encounter in executing skepticism), and intentions toward acting skeptically. We control for Big 4 audit firm membership, the ethical tone at the top of each audit firm, client importance, and budget pressure to represent audit firm-level antecedents to skeptical actions. We measure skeptical actions with respect to searching for evidence, questioning the veracity of evidence, and suspending judgment to consider evidence before reaching a decision for actual audit engagements in practice.

Our results reveal that higher-ranked auditors have greater neutral trait skepticism than lower-ranked auditors and partners’ scores with respect to professional moral courage to take action are significantly higher than all other ranks. In contrast, we find that partners and managers have more interpersonal trust than lower-ranked auditors, possibly because auditors with lower trust are most likely to leave the profession entirely (Cohen, Dalton, and Harp 2017). With respect to individual differences, female auditors have lower skepticism traits, while more-knowledgeable auditors have higher skepticism traits. Regarding personality, we find that more-skeptical auditors tend to be conscientious, open to new experiences, and express greater narcissism. They are also less agreeable and less psychopathic than less-skeptical auditors. Hypothesis-testing results are consistent with the Theory of Planned Behavior, whereby skepticism traits are positively associated with attitudes toward behaving skeptically, subjective norms about skepticism,

perceived behavioral control, and intentions toward acting skeptically. Importantly, these intentions are positively associated with auditors' subsequent search for information, questioning of evidence, and suspending judgment while making audit judgments and decisions in the field.

Our study yields several notable incremental contributions. First, we provide large-scale evidence on the antecedents to auditors' professional skepticism using validated scales, revealing the importance of gender and task-specific knowledge. Second, audit firms use personality tests during personnel screening (e.g., KPMG 2020) and our results speak to the importance of finding the right personality fit for the profession with regard to ultimately attracting and retaining professionals that are able to take skeptical actions as the standards and regulators require. Further, because our results reveal specific associations between three alternative measures of trait professional skepticism – with respect to neutral, presumptive doubt, and moral courage – and a host of personality traits, users of our research can map the type of skepticism that a task requires with the type of personality trait necessary to accomplish a particular auditing objective. Our results are also notable because they report on data that is particularly difficult to obtain – psychometric details including sensitive personal information across all ranks in audit firms.

Our third incremental contribution lies in providing an empirical test of a conceptual model of auditor professional skepticism, which builds on existing conceptual models (Nelson 2009; Hurtt et al. 2013; Nolder and Kadous 2018) and the Theory of Planned Behavior. The conceptual models on auditor professional skepticism developed in prior literature have been important in motivating research on skepticism and its relationship with audit quality (Knechel, Krishnan, Pevzner, Shefchik, and Velury 2013), as well as guiding a path towards ultimate empirical tests – ours is the first study to provide large-scale empirical evidence on many aspects that these models articulate as important. The results from our large sample size across a range of auditor ranks and

audit firms provide assurance regarding the external validity and generalizability of the associations that we observe. Further, no prior research in auditing provides an empirical test of the Theory of Planned Behavior with respect to the critical role that attitudes, perceived behavioral control, and subjective norms play in skeptical intentions and skeptical actions. We find that subjective norms are the most important driver of auditors' intentions to ultimately act with skepticism. Thus, we provide a specific avenue (i.e., social pressure) by which interventions can focus to encourage organizational change regarding enhancing professional skepticism.

Finally, our study provides a holistic understanding of professional skepticism by simultaneously incorporating antecedents of trait-based professional skepticism, factors that affect the association between trait skepticism and skeptical intentions, and of the relationship between skeptical intentions and skeptical actions. This approach allows us to examine relative effect sizes of given associations (e.g., the association between subjective norms and intentions to behave skeptically), while controlling for other relevant factors (e.g., the association between attitudes and intentions to behave skeptically). In contrast, prior empirical research on professional skepticism often focuses on singular relations in isolation such as between trait skepticism and auditors' reliance on management explanations (Quadackers, Groot, and Wright 2014), effects of partner communication on auditors' skepticism (e.g., Harding and Trotman 2017), or supervisors' evaluations of skeptical behavior (Brazel, Jackson, Schaefer and Stewart 2016).

With respect to the remainder of this paper, we note that the following section contains our literature review, conceptual model, and hypotheses. The remaining sections articulate methods and results. The final section concludes and articulates limitations.

## II. LITERATURE REVIEW AND HYPOTHESES

### Models of Professional Skepticism in Auditing

Auditing standards emphasize the importance of skepticism (IAASB 2012; PCAOB 2003; PCAOB 2006) and note its role in the collection and critical evaluation of evidence (IAASB 2004).<sup>1</sup> Regulators provide many examples of deficiencies in skepticism leading to audit quality detriments (e.g., IFIAR 2015; PCAOB 2019), and researchers offer a number of conceptual models with respect to auditor professional skepticism. Nelson's (2009) model describes how auditors apply knowledge, leverage personal traits, and respond to incentives with respect to audit-evidence judgments. Auditor knowledge can have both positive and negative effects on skepticism, whereby it may enable auditors to correctly recognize evidence patterns, but it may also lead auditors to default to (common) non-error explanations even in the presence of a misstatement. Individual personality traits may predispose auditors toward adopting a neutral view of skepticism – one in which the auditor seeks to verify management assertions without any directional bias (i.e., 'trust but verify') – or may predispose auditors toward adopting a presumptive doubt view – one in which the auditor assumes that management has a predisposition to bias financial statement assertions (Cohen et al., 2017). In addition to knowledge and personality traits, situational characteristics yield incentives for auditors to adopt varying levels of skepticism. For example, a complex, risky client may trigger a more skeptical mindset, whereas budget pressure may trigger a less skeptical mindset. Within this context, Nelson's (2009) model adopts a presumptive doubt perspective and

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<sup>1</sup> The PCAOB AS 1015 provides guidance on professional skepticism. "Professional skepticism is an attitude that includes a questioning mind and a critical assessment of audit evidence. The auditor uses the knowledge, skill, and ability called for by the profession of public accounting to diligently perform, in good faith and with integrity, the gathering and objective evaluation of evidence (paragraph .07) ... Since evidence is gathered and evaluated throughout the audit, professional skepticism should be exercised throughout the audit process (paragraph .08) ... The auditor neither assumes that management is dishonest nor assumes unquestioned honesty. In exercising professional skepticism, the auditor should not be satisfied with less than persuasive evidence because of a belief that management is honest" (paragraph .09).

anticipates that evidential input will integrate with skeptical judgments and actions to yield high-quality evidential outcomes.<sup>2</sup>

The Hurtt (2010) model focuses on skepticism as an individual auditor trait, anticipating that state skepticism (which derives from situational characteristics) mediates the association between trait skepticism and skeptical behavior. Nolder and Kadous' (2018) model adopts a similar perspective, whereby auditors' skepticism incorporates both a skeptical attitude and a skeptical mindset whereby auditors integrate evidential input via cognitive processing in targeting their skeptical judgments and intentions toward skeptical actions. Their model also acknowledges the importance of social/situational determinants with respect to auditor skepticism.

Figure 1 depicts our own conceptual model, which integrates and extends the collective whole of these models. Phase I considers a host of characteristics that may affect auditors' skepticism, including individual differences (age, gender, experience, and knowledge) and personality traits ('Big 5' and Dark Triad personality characteristics). We conceptualize various perspectives on skepticism, including neutral, presumptive doubt, and the moral courage to act, each of which the professional standards recognize as necessary in varying decision settings. For example, professional quality control standards take a neutral perspective whereby "the auditor neither assumes that management is dishonest nor assumes unquestioned honesty ... the auditor should not be satisfied with less than persuasive evidence because of a belief that management is honest" (PCAOB AS 1015 para. .09). In contrast, auditing standards relating to the consideration of fraud take the presumptive doubt perspective and acknowledge potential management bias by "recognizing the possibility that a material misstatement due to fraud could exist, notwithstanding

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<sup>2</sup> Hurtt, Brown-Liburd, Earley, and Krishnamoorthy (2013) directly extend Nelson's (2009) model, providing important insights regarding the antecedents of skepticism including auditor, evidential, client, and external environment characteristics.

the auditor's past experience of the honesty and integrity of the entity's management" (ISA 240.24). From this perspective, skepticism is the opposite of trust (Shaub 1996) and auditors present varying levels of dispositional trust or distrust (McKnight, Choudhury, and Kacmar 2002; McKnight, Kacmar, and Choudhury 2004; Harding, Azim, Jidin, and Muir 2016). The moral courage perspective focuses on auditors' willingness to take skeptical actions (Hurt et al. 2013), and auditing standards also reflect this perspective. For example, ISA 200 states that "in cases of doubt about the reliability of information or indications of possible fraud ... the ISAs require that the auditor investigate further and determine what modifications or additions to audit procedures are necessary to resolve the matter" (ISA 200, A21).

**[Insert Figure 1 About Here]**

Phase II advances the Theory of Planned Behavior (Ajzen 1991; Ajzen 2005; Ajzen 2012) in the context of auditor professional skepticism. Here we posit that variation in trait-based professional skepticism is positively associated with attitudes about behaving skeptically (Kadous, Nolder, and Peecher 2019; Nolder and Blankenship 2019), subjective norms with respect to the social pressure to behave skeptically (Peecher 1996), and perceived behavioral control over behaving skeptically (Hasson and Knechel 2019). We argue that each of these factors is positively associated with intentions to act skeptically. In Phase III, we anticipate that auditors' skeptical intentions will positively mediate the associations between attitudes, subjective norms, and perceived behavioral control and skeptical actions with respect to searching for evidence, questioning its veracity, and suspending judgment until evidence search and analysis concludes. Further, we acknowledge the role of situational characteristics in affecting skeptical actions.

## **Individual Differences, Personality Characteristics, and Professional Skepticism**

Individual differences exist that are associated with auditors' skepticism – albeit with mixed directional inferences – including age, experience, gender and task-specific knowledge. In experimental settings, Payne and Ramsay (2005) report a decline in skepticism as auditors age and gain more experience. Similarly, Shaub and Lawrence (1999) find that staff are significantly more skeptical than higher-ranked auditors. Alternatively, older partners might accumulate portfolios of higher-quality clients (Lennox and Wu 2018), for which skepticism is less critical and therefore less salient. In contrast, Knapp and Knapp (2001) report that audit managers are more skeptical than seniors when assessing fraud risk. Archival research similarly presents mixed evidence. For example, both Goodwin and Wu (2016) and Sundgren and Svanström (2014) document a negative association between partner age and audit quality, while Chi, Myers, Omer and Xie (2017) document a positive association between a partner's years of prior experience (as a partner) at the start of the current engagement and audit quality. The association between gender and professional skepticism is unclear as well (Olsen and Gold 2018), although neuroscience research reveals that negative emotions are more salient for women (Drobyshevsky, Baumann, and Schneider 2006; Koch, Pauly, Kellermann, Seiferth, Reske, Backes, and Habel 2007).

While Nelson (2009) posits that auditor knowledge can have either positive or negative effects on skepticism, we expect that task-specific knowledge is positively associated with skepticism. An auditor who has previously encountered fraud or who has assessed subjective management valuations will likely be more skeptical than auditors without such experiences because they are familiar with methods by which management accomplishes manipulations. This line of reasoning is consistent with research documenting that task-specific knowledge improves audit quality (Bonner 1990; Goldman, Harris, Omer 2019).

Personality characteristics may also play a role in trait-based professional skepticism (Khan and Harding 2020). The ‘Big 5’ personality characteristics include extraversion, conscientiousness, emotional stability, openness, and agreeableness (McCrae and Costa 1990). Extraversion represents the degree to which an individual is enthusiastic and empathetic as opposed to being reserved and quiet around others (Scott, Colquitt, Paddock, and Judge 2010). Conscientiousness concerns relative self-discipline (Judge and Ilies 2002). Emotional stability, or its opposite – neuroticism – represents the degree to which an individual is calm as opposed to anxious or easily upset (Eysenck 1991). Openness concerns a relative willingness to engage in new or potentially risky experiences (Mervielde, DeFruyt, and Jarmuz 1998). Agreeableness reflects the extent to which an individual is sympathetic as opposed to being critical (Costa and McCrae 1992). In a study employing undergraduate accounting students and the Hurtt (2010) measure of professional skepticism, Farag and Elias (2016) report a positive association between each of the Big 5 personality characteristics and trait skepticism. Therefore, we anticipate a positive association between skepticism and extraversion, conscientiousness, emotional stability, and openness. However, we anticipate a negative association between skepticism and agreeableness because it seems logical that less-agreeable auditors are more likely to challenge management assertions.

The Dark Triad personality characteristics may also play a role in trait-based professional skepticism. Machiavellianism, narcissism, and psychopathy share a common theme with respect to a lack of appropriate empathy and emotionality in interactions with others (Paulhus and Williams 2002; Book, Visser, and Volk 2015). Recent work by Hobson, Stern, and Zimbelman (2019) finds that auditors with high levels of Dark Triad personality characteristics are distrustful (i.e., avoid unjustified trust) even in the presence of social interactions with client managers. Further, Church, Dai, Kuang, and Liu (2019) suggest that more-narcissistic auditors encourage

higher financial reporting quality, and are also tougher negotiators, thereby achieving more-conservative negotiated outcomes. At the same time, other research shows that Dark Triad personality characteristics are associated with unethical attitudes and counterproductive workplace behaviors (Bailey 2015; Harrison, Summers, and Mennecke 2018; O’Boyle, Forsyth, Banks, and McDaniel 2012). Further, more-psychopathic individuals tend to do whatever is necessary to achieve their goals, and are more likely to engage in or accept unethical behavior through the process of moral disengagement (Stevens, Deuling and Armenakis 2012). Hence, individuals with greater psychopathy may be less skeptical. Based on this discussion, we anticipate a positive association between trait skepticism and both Machiavellianism and narcissism, but a negative association with psychopathy. Our conceptual model begins by investigating how individual differences and personality characteristics affect trait-based professional skepticism:

**RQ1(a)** How are individual differences and **(b)** personality characteristics associated with professional skepticism traits?

### **Professional Skepticism and The Theory of Planned Behavior**

The second phase in our conceptual model employs the Theory of Planned Behavior (Ajzen 1991; Ajzen 2012), which researchers use to predict, explain, and change human behavior. Nolder and Kadous (2018, p. 4) suggest that the attitude literature can provide insights into the relationship between skeptical attitudes and skeptical behavior and call for research that examines this relationship, while noting that “conceptualizing professional skepticism as a mindset and an attitude implies that skepticism is exercised, and thus should be measured, situationally”. Our goal is to predict and explain how trait-based professional skepticism affects attitudes toward, intentions about, and ultimately auditors’ skeptical actions with respect to evidence collection and evaluation.

The Theory of Planned Behavior proposes, and our conceptual model is consistent with, the notion that intentions about performing a behavior mediate the direct association between attitudes,

subjective norms, and perceived behavioral control with respect to behavioral actions.<sup>3</sup> Attitude “refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question” and subjective norm “refers to the perceived social pressure to perform or not to perform the behavior” (Ajzen 1991, p. 188). Perceived behavioral control “refers to people’s perception of the ease or difficulty of performing the behavior of interest” (Ajzen 1991, p. 183) and is closely linked to perceived self-efficacy, i.e., “judgments of how well one can execute courses of action required to deal with prospective situations” (Bandura 1977; Bandura 1982, p. 122). A limitation of the Theory of Planned Behavior is that it provides few insights with respect to antecedents of attitude, subjective norms (i.e., social pressures), and perceived behavioral control (e.g., Armitage and Conner 1999; Armitage and Conner 2001). Therefore, we extend the theory by examining the role of professional skepticism traits as antecedents to these drivers of intention, predicting that:

**H1:** Professional skepticism traits are positively associated with:

- (a) attitudes about behaving skeptically
- (b) subjective norms with respect to social pressures to behave skeptically, and
- (c) perceived behavioral control to behave skeptically.

Attitudes, subjective norms, and perceived behavioral control each predict intentions, which are crucial for securing long-term goals (Ajzen 1991; Kuhl and Quirin, 2011; Baumeister and Bargh 2014). Intentions are important because they indicate how much effort individuals will exert to engage in subsequent decision-relevant actions. Hurtt et al. (2013) cast these factors within the

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<sup>3</sup> According to Ajzen (1991, p. 189), precursors to attitudes, subjective norms, and perceived behavioral control include “*behavioral beliefs*, which are assumed to influence attitudes toward the behavior, *normative beliefs* which constitute the underlying determinants of subjective norms, and *control beliefs* which provide the basis for perceptions of behavioral control”. Fishbein and Ajzen (1975) employ a cognitive/information-processing approach to understanding the behavioral beliefs individuals hold, which they form by linking behaviors to outcomes with respect to positive or negative attitudinal expectations. In this way, individuals learn to form positive attitudes about behaviors with desirable consequences and negative attitudes about behaviors with undesirable consequences. Normative beliefs involve how an individual is motivated by referent groups’ relative approval or disapproval regarding a given behavior. Control beliefs relate to factors that enhance or inhibit the relative difficulty of performing a given behavior.

context of the motivation to behave skeptically. The Theory of Planned Behavior anticipates a positive association between: an individual's *attitude* towards a behavior (Nolder et al. 2019), *subjective norms* (i.e., social pressure) surrounding the behavior (Peecher 1996), a higher *perceived behavioral control* (i.e., self-efficacy) with respect to the behavior (Hasson and Knechel 2019) and the *intention* towards taking action with respect to the behavior (e.g., Gibson and Frakes 1997; Carpenter and Reimers 2005, 2013; Heirman et al., 2016). Nolder and Kadous (2018, p. 9) conceptualize attitudes as “auditors’ cognitive and affective evaluative responses associated with management’s assertions” and depict perceived behavioral control in the context of auditors’ beliefs about their authority to modify audit programs in light of risk assessments. Research in fraud brainstorming shows that leadership behaviors relating to subjective norms can affect subordinates’ skeptical orientations (i.e., intentions) and subsequent actions (Harding and Trotman 2017; Dennis and Johnstone 2018). Other research shows that when peers share attitudes reflecting a high (low) emphasis on professional skepticism, other auditors are more (less) skeptical in their judgments (Ying, Patel, and Pan 2019). Based on this discussion, we expect that:

**H2: (a)** Attitudes, **(b)** subjective norms, and **(c)** perceived behavioral control are positively associated with intentions to behave skeptically.

### **Skeptical Actions**

Meta-analyses typically indicate a strong positive association between intentions and behavioral actions (e.g., Armitage and Conner 2001; Webb and Sheeran 2006). Likewise, in an auditing context, Fullerton and Durtschi (2005) show that internal auditors with high professional skepticism traits (based on the Hurtt scale) are more likely than auditors with low levels of skepticism to expand their evidence search. Other studies also show a positive association between risk assessments (i.e., intending to act skeptically) and both modifying audit plans and conducting

audit procedures (e.g., Johnstone and Bedard 2001; Graham and Bedard 2003; Hoffman and Zimbelman 2009).

In contrast, other research shows that auditors have difficulty linking fraud risk assessments with fraud risk responses such as tailoring audit plans (e.g., Mock and Turner 2005; Hammersley, Johnstone, and Kadous 2011). Therefore, auditors in some cases fail to follow through with skeptical actions despite properly assessing risk, which implies only an intention to respond according to professional standards (e.g., IAASB 2004, ISA 240). Further, research also shows that different types of skepticism, one that adopts a neutral perspective as compared to one that adopts a presumptive doubt perspective, may differentially affect skeptical actions. Quadackers et al. (2014) find that auditors with higher levels of presumptive doubt skepticism who are making decisions in a high-risk setting respond by making more skeptical judgments and decisions compared to auditors with higher levels of neutral skepticism. This implies that individuals with differential skeptical traits may respond differently with respect to their skeptical intentions and subsequent actions. Bowlin, Hobson, and Piercey (2015) also cast some doubt on the association between skeptical intentions and skeptical actions. They find that auditors who adopt a skeptical frame of mind decrease audit effort upon auditor-client rotation, reducing audit quality. While acknowledging tension with respect to our expectations, we make the following predictions:

**H3:** Intentions to behave skeptically are positively associated with skeptical actions during the audit in terms of:

- (a) searching for audit evidence,
- (b) questioning audit evidence, and
- (c) suspending judgment about audit evidence.

### **III. METHODOLOGY**

#### **Sample and Participants**

We obtain our data from Dutch audit firms through the Foundation for Auditing Research (FAR). Representatives of an independent datacenter (CenterData) sent an email invitation (and a maximum of three subsequent follow-up emails) during 2018 to audit firms who had previously agreed to participate in the FAR's research agenda. CenterData anonymized and transformed responses from six audit firms in the Netherlands that chose to participate, including two Big 4 and four non-Big 4 firms. Each firm agreed to provide a specific number of fiscal year-end 2016 engagements in proportion to the total number of audit engagements that they conduct each year.<sup>4</sup>

Table 1 shows that this sampling process yielded 342 selected engagements and 1,447 individual auditors. In total, 858 auditors responded (59.3% response rate), and after eliminating observations with missing data, the final sample size equals 663 auditors.<sup>5</sup> The percentage (number) of responses by rank is 21% (139), 26% (174), 16% (103), and 37% (247) for partners, managers, seniors, and staff, respectively. Firm 1 makes up the greatest proportion of the sample (36.6%), whereas Firm 6 makes up the smallest proportion (1.7%).<sup>6</sup>

Participating auditors each responded to our invitation via a survey. The first part included questions relating to demographics and measures of professional skepticism, which we introduced as follows: "In this first part of the survey, you will have to answer questions about yourself,

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<sup>4</sup> Representatives at each firm used a three-step process to select engagements. First, they randomly selected partners whose engagements were to be the subject of within-firm engagement quality review (this requirement was imposed because the authors are interested in engagement quality review for a different research study). If that process yielded the agreed-upon number of engagements, the selection process concluded. If it did not, the second step included randomly selecting any remaining audit partners within the firm until the agreed-upon number of engagements was achieved. Third, if the sampling process exhausted all partners and the agreed-upon number of engagements was still not achieved, then the representatives randomly selected the sample from all other engagements.

<sup>5</sup> Of the 663 auditors in our final sample, 140 were assigned to engagements that would later be subject to engagement quality review. There are no significant differences in terms of professional skepticism traits, attitudes, intentions and actions based on whether an auditor's engagement was or was not selected for engagement quality review. Analyses using responses of auditors working on non-reviewed engagements only ( $N = 523$ ) yield essentially the same results.

<sup>6</sup> In untabulated results, about one percent of our sample clients are listed. Sixty-one percent use Dutch GAAP, 11 percent use IFRS, less than one percent use US GAAP, and for the remainder this information is missing. Audit requirements in the Netherlands are derived from EU legislation. The International Standards on Auditing as issued by the International Auditing and Assurance Standards Board are applicable.

including how you feel and think about certain aspects of your work life and life in general” (underline appears in original). The next part included questions relating to the auditors’ employer, which we introduced as follows: “In this second part of the survey, you will have to answer questions about perceptions about your accounting firm and your work environment.” The third part included an experiential questionnaire that asked auditors to reflect on one of their actual audit engagements as directed by CenterData personnel and audit firm contacts (i.e., individual auditors were not allowed to self-select an engagement of their choice). We introduced this part as follows: “In the remainder of this survey, you will have to answer questions about the audit engagement of a specific client that you worked on (as explained in the accompanying letter to this survey research). All questions hereafter refer to this specific engagement ...”.

The experiential questionnaire asked auditors to make retrospective recalls of information relating to each of the phases in our conceptual model. Retrospective recalls provide evidence about the facts and inferences that individuals believe to be part of the original event (e.g., Ericsson and Simon 1980; Nelson, Elliott, and Tarpley 2002; Hammersley 2006; Dennis and Johnstone 2018). Since retrospective recalls are subject to validity threats, we followed the precepts of the Critical Incident Technique (Flanagan 1954) and the Experimental Questionnaire Method (Gibbins and Qu 2005) to minimize these threats. Furthermore, we promoted accuracy by asking auditors to recall specific experiences and by avoiding leading questions (e.g., Christ 1993; Gibbins, Salterio, and Webb 2001; Gibbins and Trotman 2002; Nelson et al., 2002).

**[Insert Table 1 About Here]**

## **Variables**

### ***Professional Skepticism***

We employ three measures of skepticism that accounting researchers use: the Hurtt Professional Skepticism scale (*HPS*; Hurtt 2010), the Professional Moral Courage scale (*PMC*; Sekerka et al.

2009), and Rotter's Interpersonal Trust scale (*RIT*; Rotter 1967; Wrightsman 1991; Quadackers et al. 2014). *HPS* adopts a neutral perspective and includes 30 questions that collectively assess auditors' behaviors with respect to having a questioning mind, being willing to suspend judgment, searching for knowledge, possessing interpersonal understanding, and having autonomy and self-esteem. Each question includes a six-point Likert response scale that ranges from strongly disagree to strongly agree, with higher scores indicating greater neutral trait skepticism. *PMC* includes 15 questions about work-related ethical issues indicating a behavioral perspective consistent with the desire and ability to act. Each question includes a five-point Likert scale that ranges from almost never true to almost always true, with higher scores indicating a greater willingness to take skeptical actions. *RIT* includes 25 questions that capture an expectancy that another individual or group can be relied upon from a presumptive doubt perspective. Each question includes a five-point Likert response scale that ranges from strongly disagree to strongly agree, whereby higher scores indicate greater interpersonal trust; we reverse-scored the questions such that higher scores indicate greater presumptive doubt trait skepticism (*RIT-Distrust*). See Appendices A and B for individual questions and accompanying measurement scales relating to all variables.

### ***Individual Differences and Personality Traits***

We measure individual differences including *AGE* (in years), *GENDER* (= 1 if female; = 0 if male), *EXPERIENCE\_YRS*, and self-assessed *AUDIT\_KNOWLEDGE* (on a scale from = 1 if not at all experienced to = 7 if extremely experienced) for tasks relating to valuation (*KNOW\_VALUATION*; level of experience with difficult accounting measurement and valuation problems), fraud (*KNOW\_FRAUD*; level of experience assessing risks of material misstatements due to fraud), and analytical procedures (*KNOW\_ANALYTICAL\_PROC*; level of experience applying analytical procedures during an audit). We measure personality traits in terms of the 'Big

5' types: *EXTRAVERSION* (the degree of enthusiasm with being around others as opposed to being reserved and quiet around others), *AGREEABLENESS* (the degree of criticality as opposed to sympathy towards others), *CONSCIENTIOUSNESS* (the degree of dependability and self-discipline as opposed to disorganization or carelessness), *EMOTIONAL\_STABILITY* (the degree of anxiousness as opposed to calm), and *OPENNESS* (the degree to which an individual is open to new experiences as opposed to preferring conventional routines) using the Ten Item Personality Inventory (Gosling et al., 2003 on a scale from = 1 strongly disagree to = 7 strongly agree). We also measure personality in terms of the Dark Triad: *MACHIAVELLIANISM* (the extent of subtle or unscrupulous deception or expediency in decision making), *NARCISSISM* (the extent of self-absorption or arrogance in decision making), and *PSYCHOPATHY* (the extent of amoral or antisocial behavior) using the Short Dark Triad scale (Jones and Paulhus 2002 on a scale from = 1 strongly disagree to = 5 strongly agree).

### ***Attitudes and Intentions***

Consistent with prior research (e.g., Buchan 2005; Dowling et al. 2009; Fishbein and Ajzen 2010), we use direct measures of attitude, subjective norms, perceived behavioral control, and intentions.<sup>7</sup> We measure each auditor's *ATTITUDE* toward professional skepticism based on five relative indicators: good/bad, harmful/beneficial, pleasant/unpleasant, difficult/easy, and unimportant/important, whereby a higher score indicates a more-positive attitude. We measure subjective norm (*SN*) based on three relative indicators about social expectations around skepticism (their own feelings of social pressure, others' feelings of social pressure, and the firm's social pressure to maintain skepticism) to which auditors rate their level of agreement, whereby a

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<sup>7</sup> According to the Theory of Planned Behavior, attitudes, social norms, and perceived behavioral control are themselves determined by readily accessible beliefs (i.e., behavioral beliefs, normative beliefs, and control beliefs, respectively) (Ajzen 1991; Ajzen 2005; Ajzen 2012; Fishbein and Ajzen 2010). Assessing these beliefs is outside the scope of our study.

higher score indicates that an auditor perceives greater social pressure to engage in skeptical behavior. We measure perceived behavioral control (*PBC*) based on three relative indicators about the extent to which an auditor believes they have the self-control to maintain skepticism during the audit (whether maintaining skepticism is up to the auditor, whether the auditor believes that maintaining skepticism is beyond their control, and their confidence in maintaining skepticism), whereby a higher score indicates that an auditor has higher self-efficacy in maintaining skepticism. The Theory of Planned Behavior proposes that these three factors drive intention (i.e., the likelihood that an individual plans to engage in a behavior).<sup>8</sup> We measure *INTENTION* based on relative agreement with the following statement ‘I intend to maintain PS throughout my next audits’, whereby a higher score indicates a stronger intention to take skeptical action.

### ***Situational Control Variables***

Each of the conceptual auditor-skepticism models presents skepticism as situational (Nelson 2009; Hurtt 2010; Nolder and Kadous 2018), suggesting possible mediating or moderating roles for situational variables; for simplicity, we model these variables as controls with main effects on skeptical actions.<sup>9</sup> Regarding the audit firm, as opposed to the individual auditor, Nolder and Kadous (2018, p. 4) posit that the “fact that auditors’ beliefs and feelings about risk are, at least in part, fostered within the firms, and not innate, implies that firms have some control over auditors’ skepticism”. We therefore control for the type of audit firm, whereby *BIG\_4* = 1 if the auditor’s firm is one of the four largest; = 0 otherwise, anticipating a positive association with skeptical actions. The tone that top management at the audit firm sets is also likely important for how auditors within the firm act with respect to skepticism. Johnstone, Sutton, and Warfield (2001)

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<sup>8</sup> For the variables *HPS*, *PMC*, *RIT*, *ATTITUDE*, and *SUBJECTIVE\_NORM* Cronbach alpha scores are at or above 0.60, which indicates an acceptable composite reliability (Tabachnick and Fidell, 2013); Cronbach’s alpha for *PERCEIVED\_BEHAVIORAL\_CONTROL* equals 0.34. See Appendix B for specific values.

<sup>9</sup> We obtain similar results when modeling situational variables as mediators or moderators.

propose a continuum of audit firm culture, which ranges from a public duty culture (whereby the firm encourages its auditors to consider the needs of investors and creditors by adhering to the professional ethics standards) to a client advocacy culture (whereby the firm encourages its auditors to ‘add value’ to clients by viewing themselves as business partners with client management and thereby moving away from professional ethics standards).<sup>10</sup> We measure audit firm culture via *TONE\_AT\_TOP*, which consists of four variables about firm expectations around ethical behavior to which auditors rate their level of agreement (e.g., behavior of leadership and tolerance for unethical acts), whereby a higher score indicates that an auditor perceives that the firm encourages a more ethical tone at the top (Sweeney, Arnold, and Pierce 2010). We expect a positive association between *TONE\_AT\_TOP* and skeptical actions. We also measure *CLIENT\_IMPORTANCE* to proxy for the extent of resources that the audit firm allocates to the engagement (e.g., based on client size and complexity). We measure this variable as the number of engagement team members, and expect a positive association between *CLIENT\_IMPORTANCE* and skeptical actions. As a complement to client importance, we also control for the possibility for quality-reducing actions that result from budget pressure (e.g., Kelley and Margheim 1990; Ponemon 1992; Glover 1997; Bedard, Ettredge, and Johnstone 2008; Ettredge, Bedard, and Johnstone 2008). We measure *BUDGET\_PRESSURE* using variables relating to auditors’ ability to complete work within the allocated time; higher scores indicate greater perceived pressure. We expect a negative association between *BUDGET\_PRESSURE* and skeptical actions.

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<sup>10</sup> We note that recent work by Knechel, Thomas and Driskill (2020) conceptualizes financial statement auditing as an economic service where cooperation between the audit firm and the client is essential for improving audit quality.

## ***Skeptical Actions***

The ultimate judgment and decision-making behavior that auditors need to accomplish involves taking skeptical actions. International Auditing Standard 200 illustrates the need for auditors to take skeptical actions with respect to obtaining and evaluating audit evidence:

*Professional skepticism is necessary to the critical assessment of audit evidence. This includes questioning contradictory audit evidence and the reliability of documents and responses to inquiries and other information obtained from management and those charged with governance. It also includes consideration of the sufficiency and appropriateness of audit evidence. (para. A20)*

*Evaluating whether sufficient appropriate audit evidence has been obtained, and whether more needs to be done to achieve the objectives of the ISAs and thereby, the overall objectives of the auditor. (para. A23)*

We measure skeptical actions using three constructs from the scales in Robinson et al. (2018) and with respect to a specific audit engagement: *SEARCHING\_FOR\_EVIDENCE* (e.g., actively seeking information and using available resources), *QUESTIONING* (e.g., rejecting statements unless there exists relevant proof), and *SUSPENDING\_JDGMT* (taking time to make decisions and considering available information before reaching a decision). Higher scores indicate that the auditor acted with higher skepticism during the engagement. We estimate each phase of our conceptual model (see Figure 1) and the accompanying measurement model jointly and simultaneously via structural equation modeling.

## **IV. RESULTS**

### **Measurement model**

The results of the CFA are reported in Appendix IV. The measurement model provides a good fit for the data. The variables attitude, perceived behavioral control, subjective norm, and skeptical actions are treated as latent constructs and the other variables are all treated as observed variables. All factor loadings are significant and, except for perceived behavioral control, the Cronbach alpha's are at or above .60 indicating an acceptable composite reliability (Tabachnick and Fidell 2013).<sup>11</sup>

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<sup>11</sup> Results are similar when we only take into account the observed underlying items with a factor loading above .45.

### **Descriptive Statistics: Skepticism**

Table 2 reports descriptive statistics on trait skepticism (Panel A), descriptive statistics on skepticism by rank (Panel B), and differences in skepticism by rank (Panel C). The mean *HPS* equals 137.29 based on a theoretical range of 30-180. *HPS* for staff, seniors, managers, and partners is about 135, 136, 138, and 141, respectively. Partners' scores are significantly higher than all other ranks, and managers' scores are significantly higher than staff. Thus, higher-ranked auditors have greater neutral trait skepticism than lower-ranked auditors. The mean *PMC* equals 79.22 based on a theoretical range of 15-105. *PMC* for staff, seniors, managers, and partners is about 76, 78, 81, and 84, respectively. Partners' *PMC* scores are significantly higher than all other ranks and managers' *PMC* scores are significantly higher than seniors' and staff. Thus, higher-ranked auditors have greater moral courage to take skeptical action than lower-ranked auditors.

The mean *RIT-Distrust* equals 78.04 based on a theoretical range of 25-125. *RIT-Distrust* for staff, seniors, managers, and partners is about 79, 80, 78, and 75, respectively. Partners' *RIT-Distrust* scores are significantly lower than all other ranks and managers' scores are marginally lower than seniors' scores. The results for partners and managers imply that these auditors have greater interpersonal trust than seniors or staff, which is in contrast to the inferences for the *HPS* and the *PMC* scales. A possible explanation lies in self-selection since Cohen et al. (2017) report that auditors with lower trust are more likely to leave the profession, resulting in auditors with higher trust rising through the ranks toward manager and partner status.

**[Insert Table 2 About Here]**

### **Descriptive Statistics: Individual Differences, Personality Traits, Attitudes, and Actions**

Table 3 Panel A includes descriptive statistics, and Panel B includes comparisons by high-versus-low skepticism, dichotomized at the median of each measure. Mean *AGE* is 32 years, and

does not differ by level of skepticism. Twenty-seven percent of our auditors are female and these auditors exhibit lower *HPS* ( $t = -2.30$ ,  $p = 0.021$ ) and *PMC* ( $t = -1.80$ ,  $p = 0.065$ ) but higher *RIT-Distrust* ( $t = 2.10$ ,  $p = 0.040$ ) as compared to their male colleagues. Mean *EXPERIENCE\_YRS* is 10 and does not differ by skepticism level. Mean self-assessed *AUDIT\_KNOWLEDGE* is 14 (and by valuation, fraud, and analytical procedures equal to 4.6, 4.7, and 5.1, respectively); more-knowledgeable auditors have higher *HPS* (e.g., for total knowledge  $t = 3.80$ ,  $p = 0.000$ ) and *PMC* (e.g., for total knowledge  $t = 3.10$ ,  $p = 0.002$ ), but not higher *RIT-Distrust*.

Descriptive statistics for the Big 5 personality traits are generally favorable (i.e., high on a 7-point scale) with means as follows: *EXTRAVERSION* (4.6), *AGREEABLENESS* (4.0), *CONSCIENTIOUSNESS* (5.8), *EMOTIONAL\_STABILITY* (5.4), and *OPENNESS* (4.9).<sup>12</sup> Auditors who score higher on *EXTRAVERSION* ( $t = 3.70$ ,  $p = 0.000$ ;  $t = 2.40$ ,  $p = 0.015$ ), *CONSCIENTIOUSNESS* ( $t = 4.80$ ,  $p = 0.000$ ;  $t = 3.80$ ,  $p = 0.000$ ), *EMOTIONAL\_STABILITY* ( $t = 4.90$ ,  $p = 0.000$ ;  $t = 2.40$ ,  $p = 0.015$ ), and *OPENNESS* ( $t = 5.70$ ,  $p = 0.000$ ;  $t = 4.50$ ,  $p = 0.000$ ) have higher *HPS* and *PMC*, respectively, but not higher *RIT-Distrust*. *AGREEABLENESS* does not differ by level of skepticism. Descriptive statistics for the Dark Triad traits are also generally favorable (i.e., low on a 7-point scale) with means as follows: *MACHIAVELLIANISM* (2.8), *NARCISSISM* (2.9), and *PSYCHOPATHY* (2.1).<sup>13</sup> Auditors who score higher on *MACHIAVELLIANISM* have lower *HPS* ( $t = -3.00$ ,  $p = 0.003$ ) and *PMC* ( $t = -3.70$ ,  $p = 0.000$ ), and higher *RIT-Distrust* ( $t = 1.80$ ,  $p = 0.066$ ) than other auditors. Auditors who score higher on

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<sup>12</sup> Our sample of auditors has relatively similar levels of *EXTRAVERSION*, *AGREEABLENESS*, and *OPENNESS* and somewhat higher levels of *CONSCIENTIOUSNESS* and *EMOTIONAL\_STABILITY* compared to individuals from other studies (e.g., Ehrhart, Ehrhart, Roesch, Chung-Herrera, Nadler, and Bradshaw 2009; Romero, Gomez-Fraguela, and Lopez-Romero 2012; Isaacs, Mota, Tsai, Harpaz-Rotem, Cook, Kirwin, Krystal, Southwick, and Pietrzak 2017; Rouwelaar and DeLoo 2018; and Hardies 2019).

<sup>13</sup> Our sample of auditors has relatively similar levels of *MACHIAVELLIANISM*, *NARCISSISM*, and *PSYCHOPATHY* compared to individuals from other studies (e.g., Majors 2013; Hmieleski and Lerner 2016; Vedel and Thomsen 2017; Prusik and Szulawski 2019; Wissing and Reinhard 2019).

*NARCISSISM* have higher *HPS* and *PMC* ( $t = 1.90, p = 0.063$ ;  $t = 2.10, p = 0.039$ ), while auditors who score higher on *PSYCHOPATHY* have lower *HPS* ( $t = -4.10, p = 0.000$ ) and lower *PMC* ( $t = -4.40, p = 0.000$ ), but neither measure differs by *RIT-Distrust*.

### [Insert Table 3 About Here]

Variables relevant to the Theory of Planned Behavior indicate high levels of *ATTITUDE* (mean = 5.7), *SN* (mean = 5.9), *PBC* (mean = 5.1), and *INTENTION* (mean = 6.2) toward skepticism. Auditors who score higher on these variables also score significantly higher on professional skepticism with respect to *HPS*, *PMC*, and *RIT-Distrust*, except that *SN* is not associated with *RIT-Distrust*. With respect to situational variables, we find that 50 percent of our sample are *BIG\_4* auditors, and that auditors in this category have higher levels of *HPS* ( $t = 2.30, p = 0.022$ ) and *PMS* ( $t = 4.10, p = 0.000$ ), but not *RIT-Distrust*. Mean *CLIENT\_IMPORTANCE* is about four on a 7-point scale, and only marginally differs by *PMC* ( $t = 1.70, p = 0.096$ ). Mean *TONE\_AT\_TOP* equals 21, which indicates a fairly high ethical tone at our sample audit firms, and auditors' perceptions of tone are better for more skeptical auditors in terms of *HPS* ( $t = 4.50, p = 0.000$ ) and *PMC* ( $t = 6.10, p = 0.000$ ), but not *RIT-Distrust*. *BUDGET\_PRESSURE* is moderate with a mean of 11 on a 21-point scale, and is negatively associated with skepticism in terms of *PMC* ( $t = -2.30, p = 0.024$ ), but not *HPS* or *RIT-Distrust*. With respect to skeptical actions, we find that the means of *SEARCHING\_FOR\_INFO*, *QUESTIONING*, and *SUSPENDING\_JDGMT* are each around 5.5 on a 7-point scale, and all are significantly higher for more-skeptical auditors.

### Correlations

Table 4 presents correlations. Panel A provides results for the skepticism measures, individual differences, and personality traits. *HPS* and *PMC* are significantly positively correlated ( $r = 0.49$ ), whereas their correlations with *RIT-Distrust* are insignificant. This suggests that *RIT-Distrust* is a

distinct construct, which further explains why the inferences from some of the descriptive statistics for the *HPS* and *PMC* scales are different from the *RIT-Distrust* scale.<sup>14</sup> The correlations between *HPS* and *PMC* and the other variables are fairly consistent, with positive associations with *AGE*, *EXPERIENCE\_YRS*, *AUDIT\_KNOWLEDGE*, *EXTRAVERSION*, *CONSCIENTIOUSNESS*, *EMOTIONAL\_STABILITY*, *OPENNESS*, *NARCISSISM*, and *PARTNER* rank; *HPS* and *PMC* are also negatively associated with *MACHIAVELLIANISM*, *PSYCHOPATHY*, and *STAFF* rank. *RIT-Distrust* is negatively associated with *AGE*, *EXPERIENCE*, *EMOTIONAL\_STABILITY*, and *PARTNER* rank; *RIT-Distrust* is positively associated with *MACHIAVELLIANISM*. There is a high correlation between *EXPERIENCE\_YRS* and *AUDIT\_KNOWLEDGE* ( $r = 0.51$ ), and both are positively associated with *EMOTIONAL\_STABILITY*, *OPENNESS*, and the ranks of *PARTNER* and *MANAGER*; *EXPERIENCE\_YRS* and *AUDIT\_KNOWLEDGE* are negatively associated with *MACHIAVELLIANISM* and the rank of *SENIOR*. We find significant, positive associations among each of the Big 5 personality traits and among each of the Dark Triad personality traits. Table 4 Panel B provides correlations with respect to measures of the Theory of Planned Behavior, situational characteristics, and skeptical actions. *HPS* and *PMC* both are positively associated with *ATTITUDE*, *SN*, *PBC*, *INTENTION*, *BIG\_4*, *TONE\_AT\_TOP*, *SEARCHING\_FOR\_INFO*, *QUESTIONING*, and *SUSPENDING\_JDGMT*; in contrast, the only significant correlation for *RIT-Distrust* is a negative association with *TONE\_AT\_TOP*. Regarding situational characteristics, *BIG\_4* is positively associated with *TONE\_AT\_TOP* and each of the three skeptical actions.

**[Insert Table 4 About Here]**

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<sup>14</sup> These results suggest that the three measures of skepticism represent separate constructs. This is also confirmed by an untabulated factor analysis.

## Research Questions

Table 5 presents results of structural equation testing for our conceptual model.<sup>15</sup> Regarding RQ1a, we find that individual differences affect professional skepticism traits in various respects. We have no directional expectation regarding *GENDER*, but find that female auditors have lower *HPS* ( $t = -2.03$ ,  $p = 0.042$ ) and *PMC* ( $t = -2.89$ ,  $p = 0.004$ ), but *GENDER* is not associated with *RIT-Distrust*. Given mixed evidence in prior research, we have no directional expectation between experience and skepticism traits, and find that auditors with more *EXPERIENCE\_YRS* have higher *PMC* ( $t = 2.55$ ,  $p = 0.011$ ), but lower *RIT-Distrust* ( $t = -2.75$ ,  $p = 0.006$ ). We anticipate a positive association for task-specific *AUDIT\_KNOWLEDGE*, and find that more knowledgeable auditors have higher *HPS* ( $t = 3.83$ ,  $p = 0.000$ ) and *PMC* ( $t = 5.19$ ,  $p = 0.000$ ), but there is no association with *RIT-Distrust*. Thus, female auditors are less skeptical and auditors with more knowledge are more skeptical, while the results for experience are mixed.<sup>16</sup>

### [Insert Table 5 About Here]

Regarding RQ1b and with respect to the Big Five personality traits, auditors with greater *EXTRAVERSION* have greater *HPS* ( $t = 2.27$ ,  $p = 0.023$ ), while auditors who score higher on *AGREEABLENESS* are less skeptical (*HPS*:  $t = -2.58$ ,  $p = 0.010$ ; *RIT-Distrust*:  $t = -2.10$ ,  $p = 0.035$ ); both results are consistent with our expectations. Auditors with greater *CONSCIENTIOUSNESS* are more skeptical (*HPS*:  $t = 3.58$ ,  $p = 0.000$ ; *PMC*:  $t = 3.50$ ,  $p = 0.000$ ),

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<sup>15</sup> We calculate various goodness-of-fit measures, which collectively provide strong support for our conceptual model:  $\chi^2(120) = 642.65$ ,  $p = 0.001$ ; RMSEA = 0.081 (confidence interval at 90% = 0.075 – 0.087); CFI = 0.81; SRMR = 0.076 (Hooper, Coughlan, and Mullen 2008; Kline 2016). Because of the high correlation between *AGE* and *EXPERIENCE\_YRS*, we only include *EXPERIENCE\_YRS* in the hypothesis-testing model; results remain essentially the same if we include *AGE* rather than *EXPERIENCE\_YRS*.

<sup>16</sup> As we observe significant differences between ranks, especially for the individual differences, we run additional analyses at subsamples of different ranks to rule out that our results are driven by our sample composition. Overall, results of these subsample analyses are consistent, indicating that individual differences and personality are associated with *HPS* and *PMC*. However, we do not find an effect for *GENDER* at partner level.

as are those with greater *OPENNESS* (*HPS*:  $t = 4.70$ ,  $p = 0.000$ ; *PMC*:  $t = 3.56$ ,  $p = 0.000$ ), also consistent with our expectations. Auditors with greater *EMOTIONAL\_STABILITY* have lower *RIT-Distrust* ( $t = -2.96$ ,  $p = 0.003$ ), which is in contrast to our expectations. In terms of the Dark Triad, the results reveal that auditors who score higher on *MACHIAVELLIANISM* have higher levels of *RIT-Distrust* ( $t = 5.07$ ,  $p = 0.000$ ), and those with greater *NARCISSISM* also have higher trait skepticism (*HPS*:  $t = 2.11$ ,  $p = 0.035$ ; *PMC*:  $t = 2.85$ ,  $p = 0.004$ ); both results are consistent with our expectations. Auditors with greater *PSYCHOPATHY* have lower skepticism (*HPS*:  $t = -4.63$ ,  $p = 0.000$ ; *PMC*:  $t = -4.26$ ,  $p = 0.000$ ), which is also consistent with our expectations. Taken together, we find that more skeptical auditors tend to be extraverted, conscientious, open to new experiences, and express greater Machiavellianism and narcissism. They also tend to be less agreeable, less emotionally stable, and less psychopathic. Overall, we find theoretically consistent relationships between individual differences and personality traits for the skepticism measures *HPS* and *PMC*, while these relationships are less consistent for *RIT-Distrust*; thus, *HPS* and *PMC* seem to be more reliable measures of skepticism than *RIT-Distrust*.

### **Hypothesis-Testing**

Hypotheses 1a-c predict and our results largely support that professional skepticism traits are positively associated with attitudes toward, subjective norms about, and intentions to act skeptically. Specifically, *HPS* and *PMC* are each positively associated with *ATTITUDE* ( $t = 6.51$ ,  $p = 0.000$ ;  $t = 2.45$ ,  $p = 0.014$ , respectively), *SN* ( $t = 6.00$ ,  $p = 0.000$ ;  $t = 4.94$ ,  $p = 0.000$ , respectively), and *PBC* ( $t = 5.76$ ,  $p = 0.000$ ;  $t = 2.64$ ,  $p = 0.008$ , respectively); an exception is that *RIT-Distrust* is negatively associated with *SN* ( $t = -2.14$ ,  $p = 0.032$ ). Hypotheses 2a-c predict and our results support that *ATTITUDE* ( $t = 5.99$ ,  $p = 0.000$ ), *SN* ( $t = 13.80$ ,  $p = 0.000$ ) and *PBC* ( $t = 3.86$ ,  $p = 0.000$ ) are each positively associated with auditors' *INTENTIONS* to act skeptically. A

comparison of the coefficients of *ATTITUDE*, *SN* and *PBC* shows that subjective norms (i.e., social pressure) have the largest impact on auditors' intentions. Finally, Hypotheses 3a-c predict and our results support that auditors' *INTENTIONS* to act skeptically are, indeed, positively associated with auditors' reports of acting professionally in practice with respect to *SEARCHING\_FOR\_INFO* ( $t = 2.74$ ,  $p = 0.006$ ), *QUESTIONING* ( $t = 2.85$ ,  $p = 0.004$ ), and *SUSPENDING\_JDGMT* ( $t = 3.61$ ,  $p = 0.000$ ).

We also estimate direct effects from each of the measures of the Theory of Planned Behavior to skeptical actions. The results are as follows (coefficient, two-tailed p-value): *ATTITUDE* to *SEARCHING\_FOR\_INFO* (0.058,  $p = 0.062$ ), *QUESTIONING* (0.073,  $p = 0.033$ ), *SUSPENDING\_JDGMT* (0.111,  $p = 0.001$ ); *SUBJECTIVE\_NORM* to *SEARCHING\_FOR\_INFO* (0.155,  $p = 0.001$ ), *QUESTIONING* (0.123,  $p = 0.019$ ), *SUSPENDING\_JDGMT* (0.167,  $p = 0.002$ ); *PBC* to *SEARCHING\_FOR\_INFO* (0.089,  $p = 0.124$ ), *QUESTIONING* (0.026,  $p = 0.679$ ), *SUSPENDING\_JDGMT* (0.096,  $p = 0.137$ ).

With respect to control variables for situational characteristics, we predict and find that *BIG\_4* auditors and those whose audit firms have an ethical *TONE\_AT\_TOP* act more skeptically with respect to *SEARCHING\_FOR\_INFO* ( $t = 1.72$ ,  $p = 0.085$ ;  $t = 3.51$ ,  $p = 0.000$ , respectively), *QUESTIONING* ( $t = 2.86$ ,  $p = 0.004$ ;  $t = 2.71$ ,  $p = 0.007$ , respectively), and *SUSPENDING\_JDGMT* ( $t = 1.92$ ,  $p = 0.055$ ;  $t = 4.30$ ,  $p = 0.000$ , respectively). We also predict and find that *CLIENT\_IMPORTANCE* is positively associated with skeptical action, but only with respect to *SEARCHING\_FOR\_INFO* ( $t = 3.51$ ,  $p = 0.005$ ). In contrast to our expectations, *BUDGET\_PRESSURE* appears to have no association with skeptical actions.<sup>17</sup>

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<sup>17</sup> In an additional analysis, we further extend the model by including direct effects of the scepticism traits on intention and on skeptical actions, and direct effects of individual differences and personality on attitude, subjective norm, perceived behavioral control, intention and skeptical actions. Overall, the effects tested in the main analysis remain similar. Further, we find a significant positive effect of *HPS* and *PMC* (coefficient, two-tailed p-value for *HPS* and

## V. CONCLUSIONS and LIMITATIONS

We provide an answer to calls from prior research to provide empirical tests on individual auditor characteristics (e.g., DeFond and Zhang 2014) and to calls from researchers introducing various conceptual models of auditors' professional skepticism and its associations with attitudes, intentions and skeptical actions (e.g., Nolder and Kadous 2018). The results provide insights with respect to various measures of professional skepticism: the Hurtt Professional Skepticism scale (*HPS*, which adopts a neutral perspective), the Professional Moral Courage scale (*PMC*, which focuses on taking skeptical action), and Rotter's Interpersonal Trust scale (*RIT*, which adopts a presumptive doubt perspective), so the inferences we draw are wide-ranging in their application. Further, we cannot emphasize enough that our data provide a unique and valuable contribution to the literature. Sensitive psychometric data is particularly difficult to obtain and audit firms, especially in the US, are often reluctant to approve its collection by researchers; obtaining this data across all ranks and multiple audit firms is also unusual and therefore yields valuable insights.

We advance the Theory of Planned Behavior in an auditing context, showing that behaviors underlying professional skepticism traits, and in particular those relating to *HPS* and *PMC*, are positively associated with attitudes, subjective norms, and perceived behavioral control over skepticism, which in turn affect auditors' intentions to act skeptically. Our results also have practical implications in that they may assist with designing effective interventions to improve auditors' professional skepticism. While the Theory of Planned Behavior does not provide specific guidance on the types of interventions that may be most effective (e.g., enhancing partner

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*PMC* respectively) on *INTENTION* (0.013,  $p = 0.000$ ; 0.006,  $p = 0.009$ ) and the skeptical actions *SEARCHING\_FOR\_INFO* (0.011,  $p = 0.001$ ; 0.017,  $p = 0.000$ ), *QUESTIONING* (0.022,  $p = 0.000$ ; 0.010,  $p = 0.004$ ), and *SUSPENDING\_JDGMT* (0.018,  $p = 0.000$ ; 0.016,  $p = 0.000$ ), while we find no direct effect of *RIT*. We find no consistent relationships between individual differences and personality and attitude, subjective norm, perceived behavioral control, intention and skeptical actions [ $X^2(31) = 254.202$ ,  $p = 0.001$ ; RMSEA = 0.104 (confidence interval at 90% = 0.093 – 0.116); CFI = 0.92; SRMR = 0.038].

communication [Harding and Trotman 2017], improving evaluation and reward systems [Brazel et al. 2016], or changing auditors' mindsets [Griffith, Hammersley, Kadous and Young 2015]), it does help to identify where to target behavioral interventions. From a practice-advancing perspective concerning potential interventions to foster professional skepticism, we find that subjective norms (i.e., social pressure) are the strongest predictor of auditors' intentions to act skeptically. Subjective norms relate to how individuals feel about and respond to pressure from others, so those considering using interventions to improve skeptical intentions and actions will likely most profitably employ some element of this construct. Our results also speak to criticisms by regulators who claim that auditors often lack professional skepticism. We find strong evidence that auditors both intend to act skeptically and then do believe that they are acting skeptically with respect to evidence collection and evaluation. This would suggest that there is a disconnect between auditors' and regulatory inspectors' views about what constitutes skeptical actions. Understanding and proposing theoretically grounded remedies for this disconnect are an important avenue for future research inquiry. Toward this end, future research might assess the behavioral, normative, and control beliefs underlying auditors' attitudes, social norms, and perceived behavioral control towards professional skepticism in order to guide the design of behavioral interventions to align the views of auditors and inspectors.

There exist certain limitations of our research. First, we cannot completely control for client characteristics, although we do include a rough proxy for size and complexity based on our measure of client importance. Second, due to client-confidentiality constraints, we were not allowed to directly oversee the selection of our sample selection process, and the sample selection is biased in that we requested that participating firms begin their selections by first choosing partners whose engagements were to be the subject of within-firm inspection. Each audit firm

likely has different processes for selecting engagements for within-firm inspection and the role of such processes is unclear as to potential effects on our inferences; however, when we remove such firms, we obtain essentially identical results. Third, our data comes from each individual auditor's perceptions of and recalls about past client engagement experiences, which may yield inaccuracy since these perceptions are an internal state. Other members of the team might have made different assessments (Ericsson and Simon 1980). Fourth, we cannot unequivocally determine the causality underlying our inferences. The results reveal that skepticism is increasing in auditors' task knowledge. Future research might try to determine if auditors with higher trait skepticism are more likely to stay in public accounting or if auditors become more professionally skeptical as they evolve with changing leadership roles within the firms over time.

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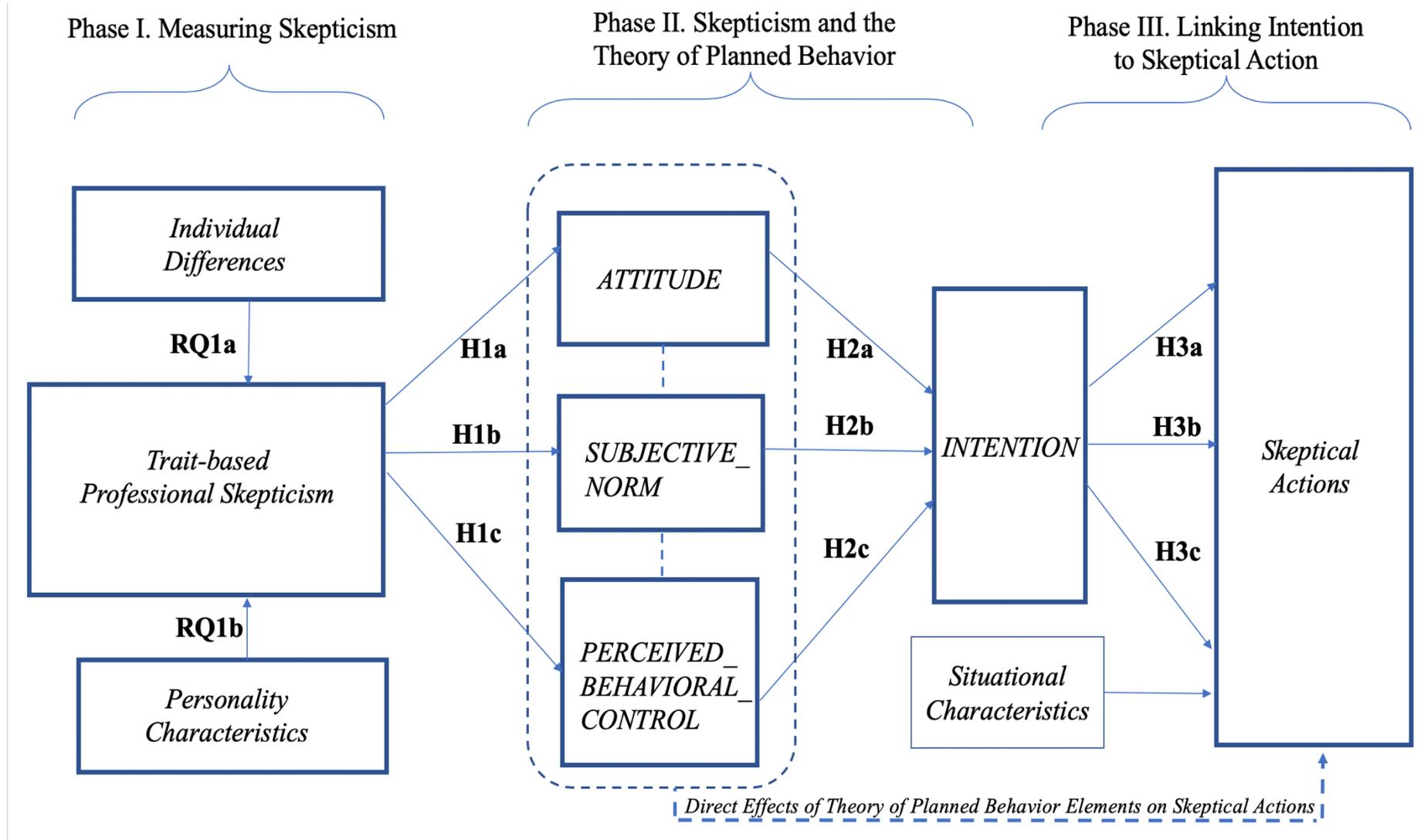
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**FIGURE 1**  
**Conceptual Model and Hypotheses**



**TABLE 1**  
**Sample Composition**

**Panel A. Sample selection, missing data, and response rate**

	<b>Total</b>	<b>Firm 1</b>	<b>Firm 2</b>	<b>Firm 3</b>	<b>Firm 4</b>	<b>Firm 5</b>	<b>Firm 6</b>
Selected engagements	<b>342</b>	140	49	78	26	36	13
Selected auditors within engagements	<b>1,447</b>	537	202	436	69	178	25
Auditor respondents	<b>858</b>	302	122	269	59	90	16
Auditor response rate	<b>59.3%</b>	56.2%	60.4%	61.7%	85.5%	50.6%	64.0%
Auditor responses with missing data	<b>(195)</b>	(59)	(32)	(58)	(12)	(29)	(5)
Final sample of auditors	<b><u>663</u></b>	<u>243</u>	<u>90</u>	<u>211</u>	<u>47</u>	<u>61</u>	<u>11</u>

**Panel B. Percentage and number of responses by rank and by firm**

Partners	21%	<b>139</b>	52	19	43	10	12	3
Managers	26%	<b>174</b>	66	9	71	3	25	0
Seniors	16%	<b>103</b>	15	35	6	34	5	8
Staff	<u>37%</u>	<b><u>247</u></b>	<u>110</u>	<u>27</u>	<u>91</u>	<u>0</u>	<u>19</u>	<u>0</u>
Total	<u>100%</u>	<b><u>663</u></b>	<u>243</u>	<u>90</u>	<u>211</u>	<u>47</u>	<u>61</u>	<u>11</u>
% by firm			36.6%	13.6%	31.8%	7.1%	9.2%	1.7%

This table presents sample composition.

**TABLE 2**  
**Descriptive Statistics: Skepticism**

**Panel A. Descriptive Statistics for Skepticism Measures**

Measure	Mean	Median	Standard deviation	Theoretical range	Actual range	Cronbach's alpha
<i>HPS</i>	137.29	137.59	10.60	30-180	103-168	0.84
<i>PMC</i>	79.22	79.00	10.61	15-105	52-105	0.91
<i>RIT-Distrust</i>	78.04	77.00	8.49	25-125	54-107	0.76

**Panel B. Descriptive Statistics by Rank**

Rank	N	Measurement Scale	Mean	Std. Dev.	Min	Max
Partner	139	<i>HPS</i>	140.93	8.98	119	165
		<i>PMC</i>	84.01	9.96	60	105
		<i>RIT-Distrust</i>	75.15	8.77	54	105
Manager	174	<i>HPS</i>	138.11	10.47	106	168
		<i>PMC</i>	81.00	9.48	59	105
		<i>RIT-Distrust</i>	78.13	8.82	57	98
Senior	103	<i>HPS</i>	136.46	9.91	110	159
		<i>PMC</i>	77.80	9.84	54	105
		<i>RIT-Distrust</i>	79.97	7.95	59	107
Staff	<u>247</u> <u>663</u>	<i>HPS</i>	135.00	11.22	103	161
		<i>PMC</i>	75.87	10.80	52	105
		<i>RIT-Distrust</i>	78.79	7.96	56	107

**Panel C. Differences in Professional Skepticism Measures by Rank**

Rank (1) vs rank (2)	<i>HPS</i>			<i>PMC</i>			<i>RIT-Distrust</i>		
	$\Delta$	t	p	$\Delta$	t	p	$\Delta$	t	p
Partner vs Manager	2.82	2.5	0.012	3.01	2.7	0.007	-2.98	-3.0	0.003
Partner vs Senior	4.47	3.7	0.000	6.21	4.8	0.000	-4.82	-4.4	0.000
Partner vs Staff	5.93	5.3	0.000	8.14	7.3	0.000	-3.64	-4.2	0.000
Manager vs Senior	1.65	1.3	0.198	3.20	2.7	0.008	-1.84	-1.7	0.083
Manager vs Staff	3.11	2.9	0.004	5.13	5.0	0.000	-0.66	-0.8	0.423
Senior vs Staff	1.46	1.1	0.253	1.93	1.6	0.119	1.18	1.3	0.207

This table summarizes the descriptive statistics for the professional skepticism measures and presents differences by rank. *HPS* = Hurtt professional skepticism; *PMC* = professional moral courage; *RIT* = Rotter interpersonal trust. Difference  $\Delta$  = [mean (1) – mean (2)] of the PS measures by ranks; p-values are two-tailed.

**TABLE 3**  
**Descriptive Statistics:**  
**Individual Differences, Personality Traits, Attitudes, Intentions, and Actions**

<b>Panel A. Descriptive Statistics</b>	<u>Mean</u>	<u>Median</u>	<u>Std. Dev</u>	<u>Min</u>	<u>Max</u>
<i>Individual Differences:</i>					
AGE	32	29	9.83	19	64
GENDER	0.27	0	0.44	0	1
EXPERIENCE_YRS	10	6	9.44	0	41
AUDIT_KNOWLEDGE	14	15	3.38	3	21
KNOW_VALUATION	4.6	5.0	1.42	1	7
KNOW_FRAUD	4.7	5.0	1.33	1	7
KNOW_ANALYTICALPR	5.1	5.0	1.10	1	7
<i>Personality Traits:</i>					
EXTRAVERSION	4.6	4.5	1.50	1	7
AGREEABLENESS	4.0	4.0	0.85	1	7
CONSCIENTIOUSNESS	5.8	6.0	0.96	2	7
EMOTIONAL_STABILITY	5.4	5.5	1.13	2	7
OPENNESS	4.9	5.0	1.06	1	7
MACHIAVELLIANISM	2.8	2.9	0.58	1	5
NARCISSISM	2.9	2.9	0.48	1.5	4
PSYCHOPATHY	2.1	2.0	0.56	1	4
<i>The Theory of Planned Behavior:</i>					
ATTITUDE	5.7	5.8	0.75	2	7
SN	5.9	6.0	0.69	3	7
PBC	5.1	5.0	0.96	2	7
INTENTION	6.2	6.0	0.71	3	7
<i>Situational Characteristics:</i>					
BIG_4	0.5	1.0	0.50	0	1
CLIENT_IMPORTANCE	4.1	4.0	1.46	1	7
TONE_AT_TOP	21	22	4.13	4	28
BUDGET_PRESSURE	11	11	3.96	3	21
<i>Skeptical Actions:</i>					
SEARCHING_FOR_INFO	5.6	6.0	0.79	2	7
QUESTIONING	5.4	5.7	0.84	2	7
SUSPENDING_JDGMT	5.7	6.0	0.72	3	7

**TABLE 3 (continued)**  
**Descriptive Statistics:**  
**Individual Differences, Personality Traits, Attitudes, Intentions, and Actions**

**Panel B. Variable Means by Skepticism Measures**

	<i>HPS</i>			<i>PMC</i>			<i>RIT-Distrust</i>		
	$\Delta$	$t$	$p$	$\Delta$	$t$	$p$	$\Delta$	$t$	$P$
<i>Individual Differences:</i>									
<i>AGE</i>	0.64	0.8	0.405	1.02	1.3	0.183	-1.14	-1.5	0.137
<i>GENDER</i>	-0.08	-2.3	0.021	-0.06	-1.8	0.065	0.07	2.1	0.040
<i>EXPERIENCE_YRS</i>	0.54	0.7	0.462	0.53	0.7	0.471	-0.66	-0.9	0.374
<i>AUDIT_KNOWLEDGE</i>	0.99	3.8	0.000	0.81	3.1	0.002	0.05	0.2	0.837
<i>KNOW_VALUATION</i>	0.31	2.8	0.005	0.34	3.1	0.002	-0.02	-0.2	0.856
<i>KNOW_FRAUD</i>	0.31	3.0	0.003	0.24	2.3	0.020	0.01	0.1	0.904
<i>KNOW_ANALYTICALPR</i>	0.37	4.3	0.000	0.22	2.6	0.009	0.06	0.7	0.468
<i>Personality Traits:</i>									
<i>EXTRAVERSION</i>	0.43	3.7	0.000	0.28	2.4	0.015	0.07	0.6	0.576
<i>AGREEABLENESS</i>	-0.07	-1.1	0.272	0.00	0.0	0.971	-0.10	-1.4	0.149
<i>CONSCIENTIOUSNESS</i>	0.35	4.8	0.000	0.28	3.8	0.000	0.11	1.4	0.155
<i>EMOTIONAL_STABILITY</i>	0.42	4.9	0.000	0.21	2.4	0.015	-0.13	-1.5	0.137
<i>OPENNESS</i>	0.46	5.7	0.000	0.36	4.5	0.000	0.06	0.7	0.498
<i>MACHIAVELLIANISM</i>	-0.14	-3.0	0.003	-0.17	-3.7	0.000	0.08	1.8	0.066
<i>NARCISSISM</i>	0.07	1.9	0.063	0.08	2.1	0.039	-0.02	-0.7	0.515
<i>PSYCHOPATHY</i>	-0.18	-4.1	0.000	-0.19	-4.4	0.000	-0.06	-1.3	0.178
<i>The Theory of Planned Behavior:</i>									
<i>ATTITUDE</i>	0.40	7.1	0.000	0.31	5.4	0.000	0.10	1.8	0.075
<i>SN</i>	0.30	5.8	0.000	0.28	5.3	0.000	0.00	0.0	0.996
<i>PBC</i>	0.29	3.9	0.000	0.18	2.5	0.014	0.18	2.4	0.018
<i>INTENTION</i>	0.44	8.6	0.000	0.38	7.1	0.000	0.16	2.8	0.005
<i>Situational Characteristics:</i>									
<i>BIG_4</i>	0.09	2.3	0.022	0.16	4.1	0.000	0.02	0.4	0.660
<i>CLIENT_IMPORTANCE</i>	0.08	0.7	0.456	0.19	1.7	0.096	-0.10	-0.9	0.379
<i>TONE_AT_TOP</i>	1.43	4.5	0.000	1.90	6.1	0.000	0.22	0.7	0.505
<i>BUDGET_PRESSURE</i>	-0.38	-1.2	0.214	-0.69	-2.3	0.024	-0.16	-0.5	0.598
<i>Skeptical Actions:</i>									
<i>SEARCHING_FOR_INFO</i>	0.46	7.7	0.000	0.51	8.7	0.000	0.10	1.6	0.101
<i>QUESTIONING</i>	0.58	9.5	0.000	0.45	7.2	0.000	0.16	2.5	0.012
<i>SUSPENDING_JDGMT</i>	0.44	8.2	0.000	0.43	8.1	0.000	0.12	2.1	0.037

This table summarizes the descriptive statistics for the professional skepticism measures and presents differences by rank. *HPS* = Hurtt professional skepticism; *PMC* = professional moral courage; *RIT-Distrust* = Rotter interpersonal trust, reverse scaled to indicate relative levels of distrust. Difference  $\Delta$  = [mean (HIGH) – mean (LOW)] of the variables by high vs. low PS measures; p-values are two-tailed.

**TABLE 4**  
**Correlation Matrix**

**Panel A. Professional Skepticism Measures, Individual Differences, and Personality Traits**

	<i>HPS</i>	<i>PMC</i>	<i>RIT-Distrust</i>	<i>AGE</i>	<i>GENDER</i>	<i>EXPERIENCE_YRS</i>	<i>AUDIT_KNOWLEDGE</i>	<i>EXTRAVERSION</i>	<i>AGREEABLENESS</i>	<i>CONSCIENTIOUSNESS</i>	<i>EMOTIONAL_STABILITY</i>	<i>OPENNESS</i>	<i>MACHIAVELLIANISM</i>
<i>HPS</i>													
<i>PMC</i>	.4901*												
<i>RIT-Distrust</i>	.0595	-.0730											
<i>AGE</i>	.2095*	.3157*	-.2048*										
<i>GENDER</i>	-.0765	-.1208*	.0919	-.2775*									
<i>EXPERIENCE_YRS</i>	.1968*	.2992*	-.1838*	.9413*	-.2432*								
<i>AUDIT_KNOWLEDGE</i>	.2553*	.3368*	-.0742	.4800*	-.1707*	.5051*							
<i>EXTRAVERSION</i>	.1760*	.1232*	-.0047	.0289	.0782	.0413	.1092*						
<i>AGREEABLENESS</i>	-.0379	.0262	-.0988	.1128*	.1134*	.0875	.0128	.0638					
<i>CONSCIENTIOUSNESS</i>	.2596*	.2271*	-.0031	.0785	.1407*	.0736	.1061*	.0375	.0530				
<i>EMOTIONAL_STABILITY</i>	.2214*	.1543*	-.1568*	.2526	-.2593*	.2426*	.1655*	-.0310	.0390	.2404*			
<i>OPENNESS</i>	.3081*	.2499*	-.0497	.1517*	-.0177	.1354*	.1321*	.3497*	.0387	.1227*	.2014*		
<i>MACHIAVELLIANISM</i>	-.1940*	-.1790*	.2011*	-.2138*	-.0781	-.2195*	-.1428*	-.0474	-.0866	-.1723*	-.1038*	-.1384*	
<i>PSYCHOPATHY</i>	-.2579*	-.2261*	.0483	-.1635*	-.1823*	-.1593*	-.0571	.0948	-.1374*	-.3856*	-.2227*	-.1013*	.4633*
<i>NARCISSISM</i>	.1003*	.1200*	-.0405	.0387	-.1063*	.0489	.1149*	.3885*	.0340	-.0573	-.0016	.2570*	.2175*
<i>PARTNER</i>	.1772*	.2323*	-.1751*	.7622*	-.2257*	.7746*	.3501*	.1153*	.0645	.1045*	.2095*	.1911*	-.1574*
<i>MANAGER</i>	.0462	.1001*	.0065	.1141*	-.0170	.1095*	.2412*	-.0309	.0353	-.0203	.0210	-.0560	-.0703*
<i>SENIOR</i>	-.0334	-.0574	.0976	-.2559*	.0533	-.2374*	-.0842	-.0319	-.0080	-.0228	-.0791	-.0503	.1041*
<i>STAFF</i>	-.1661*	-.2436*	.0684	-.5539*	.1655*	-.5739*	-.4512*	-.0451	-.0805	-.0525	-.1362*	-.0722	.1185*

(continued on next page)

This table presents the correlation matrix. \* significant at 0.01 level; p-values are two-tailed. See Appendix A for variable definitions.

**TABLE 4**  
**Correlation Matrix (cont.)**

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	<i>PSYCHOPATHY</i>	<i>NARCISSISM</i>	<i>PARTNER</i>	<i>MANAGER</i>	<i>SENIOR</i>
<i>NARCISSISM</i>	.3434*				
<i>PARTNER</i>	-.1340*	.1093*			
<i>MANAGER</i>	.0131	-.0142	-.3072*		
<i>SENIOR</i>	.0702	.0192	-.2209*	-.2558*	
<i>STAFF</i>	.0483	-.0935	-.3969*	-.4596*	-.3305*

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This table presents the correlation matrix. \* significant at 0.01 level; p-values are two-tailed. See Appendix A for variable definitions.

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**TABLE 4**  
**Correlation Matrix (cont.)**

**Panel B. Professional Skepticism Measures, Theory of Planned Behavior, Situational Characteristics, and Skeptical Actions**

	<i>HPS</i>	<i>PMC</i>	<i>RIT-Distrust</i>	<i>ATTITUDE</i>	<i>SN</i>	<i>PBC</i>	<i>INTENTION</i>	<i>BIG_4</i>	<i>CLIENT_IMPORTANCE</i>	<i>TONE_AT_TOP</i>	<i>BUDGET_PRESSURE</i>	<i>SEARCHING_FOR_INFO</i>	<i>QUESTIONING</i>
<i>HPS</i>													
<i>PMC</i>	.4901*												
<i>RIT-Distrust</i>	.0595	-.0730											
<i>ATTITUDE</i>	.3276*	.2338*	.0588										
<i>SN</i>	.3419*	.3300*	-.0772	.3516*									
<i>PBC</i>	.3020*	.2291*	.0466	.3513*	.3411*								
<i>INTENTION</i>	.4362*	.3561*	.0335	.4077*	.5741*	.3562*							
<i>BIG_4</i>	.1139*	.1463*	.0254	.1439*	.1421*	.0676	.1350*						
<i>CLIENT_IMPORTANCE</i>	.0259	.0764	-.0121	.0202	-.0098	.0852	.0151	-.0170					
<i>TONE_AT_TOP</i>	.2598*	.2991*	-.1153*	.1941*	.4315*	.2548*	.2650*	.1505*	.0028				
<i>BUDGET_PRESSURE</i>	-.0880	-.1193*	.0358	-.1617*	-.2778*	-.1493*	-.1545*	-.0862	.0772	-.2640*			
<i>SEARCHING_FOR_INFO</i>	.3926*	.4237*	.0244	.2378*	.3367*	.2300*	.3091*	.1343*	.1067*	.2779*	-.1190*		
<i>QUESTIONING</i>	.4272*	.3368*	.0627	.2107*	.2685*	.1614*	.2735*	.1632*	.0391	.2156*	-.0451	.6141*	
<i>SUSPENDING_JDGMT</i>	.4479*	.4331*	.0073	.2909*	.3539*	.2443*	.3560*	.1531*	.0611	.3012*	-.0897	.7293*	.6717*

This table presents the correlation matrix. \* significant at 0.01 level; p-values are two-tailed. See Appendix A for variable definitions.

**TABLE 5**  
**Determinants of Skepticism and Attitudes, Intentions, and Skeptical Actions**

**Panel A. Determinants of Professional Skepticism**

<u>Independent variables</u>	<u>Predicted Relationship</u>	<u>Dependent variables</u>		
		<i>HPS</i>	<i>PMC</i>	<i>RIT-Distrust</i>
<i>Individual Differences (RQ1a):</i>				
<i>GENDER</i>	+/-	-1.861** [-2.03]	-2.651*** [-2.89]	0.692 [0.86]
<i>EXPERIENCE_YRS</i>	+/-	0.009 [0.20]	0.119** [2.55]	-0.112*** [-2.75]
<i>AUDIT_KNOWLEDGE</i>	+	0.478*** [3.83]	0.650*** [5.19]	0.107 [0.98]
<i>Personality Traits (RQ1b):</i>				
<i>EXTRAVERSION</i>	+	0.626** [2.27]	0.166 [0.60]	0.180 [0.74]
<i>AGREEABLENESS</i>	-	-1.114*** [-2.58]	-0.231 [-0.60]	-0.794** [-2.10]
<i>CONSCIENTIOUSNESS</i>	+	1.506*** [3.58]	1.476*** [3.50]	0.317 [0.86]
<i>EMOTIONAL_STABILITY</i>	+	0.572 [1.59]	-0.356 [-0.99]	-0.937*** [-2.96]
<i>OPENNESS</i>	+	1.797*** [4.70]	1.366*** [3.56]	0.138 [0.41]
<i>MACHIAVELLIANISM</i>	+	-0.892 [-1.24]	-0.639 [-0.89]	3.195*** [5.07]
<i>NARCISSISM</i>	+	1.893** [2.11]	2.564*** [2.85]	-1.293 [-1.64]
<i>PSYCHOPATHY</i>	-	-3.891*** [-4.63]	-3.588*** [-4.26]	-0.985 [-1.34]

This table reports the standardized coefficients of the full SEM analysis and the [t-scores]. We jointly estimate the SEM models in Panels A and B, despite presenting them in separate Panels for tabulation purposes. \*, \*\* and \*\*\* significant at respectively 0.10, 0.05 and 0.01 level. See Appendix A for variable definitions. We calculate various goodness-of-fit measures, which collectively provide strong support for our conceptual model:  $\chi^2(120) = 642.65$ ,  $p = 0.001$ ; RMSEA = 0.081 (confidence interval at 90% = 0.075 – 0.087); CFI = 0.81; SRMR = 0.076 (Hooper, Coughlan, and Mullen 2008; Kline 2016). Because of the high correlation between *AGE* and *EXPERIENCE\_YRS*, we only include *EXPERIENCE\_YRS* in the hypothesis-testing model; results remain essentially the same if we include *AGE* rather than *EXPERIENCE\_YRS*.

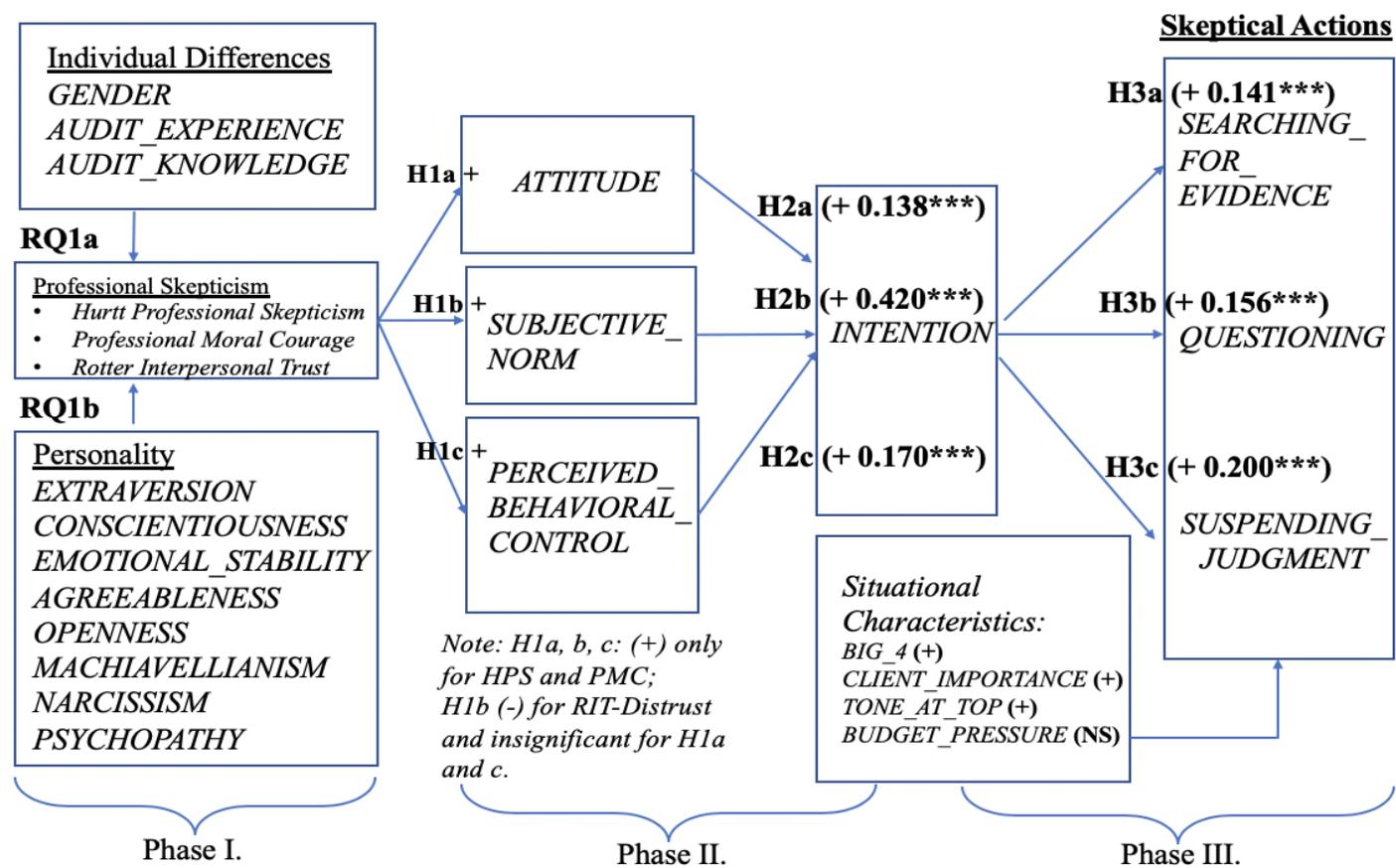
**TABLE 5 (continued)**  
**Determinants of Skepticism and Attitudes, Intentions, and Skeptical Actions**

<u>Independent variables</u>		<u>Dependent variables</u>		
		<u>ATTITUDE</u>	<u>SN</u>	<u>PBC</u>
	<u>Predicted Relationship</u>	<u>H1a</u>	<u>H1b</u>	<u>H1c</u>
<i>HPS</i>	+	0.027*** [6.51]	0.018*** [6.00]	0.012*** [5.76]
<i>PMC</i>	+	0.010*** [2.45]	0.015*** [4.94]	0.006*** [2.64]
<i>RIT-Distrust</i>	+	0.006 [1.36]	-0.007** [-2.14]	0.003 [1.08]
		<u>INTENTION</u>		
<i>ATTITUDE</i>	<b>H2a</b>	+	0.138*** [5.99]	
<i>SN</i>	<b>H2b</b>	+	0.420*** [13.80]	
<i>PBC</i>	<b>H2c</b>	+	0.170*** [3.86]	
		<u>SEARCHING_</u> <u>FOR_INFO</u>	<u>QUESTIONING</u>	<u>SUSPENDING_</u> <u>JDGMT</u>
		<b>H3a</b>	<b>H3b</b>	<b>H3c</b>
<i>INTENTION</i>	+	0.141*** [2.74]	0.156*** [2.85]	0.200*** [3.61]
<u>Situational Characteristics:</u>				
<i>BIG_4</i>	+	0.099* [1.72]	0.176*** [2.86]	0.120** [1.92]
<i>CLIENT_IMPORTANCE</i>	+	0.055*** [2.83]	0.021 [1.00]	0.033 [1.57]
<i>TONE_AT_TOP</i>	+	0.027*** [3.51]	0.023*** [2.71]	0.036*** [4.30]
<i>BUDGET_PRESSURE</i>	-	-0.001 [-0.07]	0.011 [1.40]	0.009 [1.15]

This table reports the standardized coefficients of the full SEM analysis and the [t-scores]. We jointly estimate the SEM models in Panels A and B, despite presenting them in separate Panels for tabulation purposes. \*, \*\* and \*\*\* significant at respectively 0.10, 0.05 and 0.01 level. See Appendix A for variable definitions.

**TABLE 5 (continued)**  
**Determinants of, Attitudes Toward, and Intentions About Professional Skepticism**

**Panel C. Structural Equation Model**



## APPENDIX A

### Variable Names and Descriptions

Variable Name	Description
<u><i>Professional Skepticism</i></u>	
<i>HPS</i>	Hurt Professional Skepticism scale.
<i>PMC</i>	Professional Moral Courage scale.
<i>RIT-Distrust</i>	Rotter Interpersonal Trust scale - reverse scored.
<u><i>Individual Differences</i></u>	
<i>AGE</i>	Auditor age in years.
<i>GENDER</i>	Dichotomous variable equal to 1 if the auditor is female; 0 otherwise.
<i>EXPERIENCE_YRS</i>	Auditor experience in years.
<i>Audit Knowledge:</i>	
<i>KNOW_VALUATION</i>	Measures of knowledge on a scale from 1 (not at all experienced) to 7 (extremely experienced) relating to measurement and valuation, risk of material misstatement due to fraud, and the application of analytical procedures.
<i>KNOW_FRAUD</i>	
<i>KNOW_ANALYTICAL_PROC</i>	
<u><i>Personality Traits</i></u>	
<i>EXTRAVERSION</i>	Gosling et al. (2003) measures of personality on a scale from 1 (strongly disagree) to 7 (strongly agree); measured as the mean score of answers to the underlying items.
<i>AGREEABLENESS</i>	
<i>CONSCIENTIOUSNESS</i>	
<i>EMOTIONALSTABILITY</i>	
<i>OPENNESS</i>	
<i>MACHIAVELLIANISM</i>	Jones and Paulhus (2002) measures of personality on a scale from 1 (strongly disagree) to 5 (strongly agree); measured as the mean score of answers to the Short Dark Triad items.
<i>NARCISSISM</i>	
<i>PSYCHOPATHY</i>	
<i>ATTITUDE</i>	Measure of attitude towards professional skepticism on a scale from 1 to 7 based on responses to five underlying statements; author-constructed scale based on the work of Ajzen (1991; 2006)
<i>SUBJECTIVE_NORM (SN)</i>	Measure of perceived social pressure on a scale from 1 to 7 based on responses to three underlying statements;

	author-constructed scale based on the work of Ajzen (1991; 2006).
<i>PERCEIVED_BEHAVIORAL_CONTROL (PBC)</i>	Measure of self-control on a scale from 1 to 7 based on responses to three underlying statements; author-constructed scale based on the work of Ajzen (1991; 2006).
<i>INTENTION</i>	Measure of intention towards professional skepticism on a scale from 1 (strongly disagree) to 7 (strongly agree); measured by the answer to the question ‘I intend to maintain PS throughout my next audits’; author-constructed scale based on the work of Ajzen (1991; 2006)
<u><i>Situational Characteristics</i></u>	
<i>BIG_4</i>	Dichotomous variable equal to 1 if the audit firm is a member of the Big 4; 0 otherwise.
<i>CLIENT_IMPORTANCE</i>	Measure of the importance of the client on a scale from 1 (not at all important) to 7 (extremely important).
<i>TONE_AT_TOP</i>	Measure of the extent to which there is a strong ethical culture at the auditing firm; measured on a scale from 1 to 7 based on responses to four underlying statements.
<i>BUDGET_PRESSURE</i>	Measure of time budget pressure on a scale from 1 (strongly disagree) to 7 (strongly agree); measured as the sum of the answers to the underlying 3 items.*
<u><i>Skeptical Actions</i></u>	
<i>SEARCHING_FOR_INFO</i> <i>QUESTIONING</i> <i>SUSPENDING_JDGMT</i>	Measures of skeptical action on a scale from 1 to 7 based on responses to three underlying statements; author-constructed scale based on the work of Robinson et al. (2018).

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See underlying measurement scales in Appendix B.

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## APPENDIX B Measurement Scales

### ***HURTT PROFESSIONAL SKEPTICISM SCALE (HPS) (Cronbach's alpha = 0.84)***

The Hurtt Professional Skepticism Scale (Hurtt 2010) consists of 30 items scored on a 6-point scale, ranging from 1 (strongly disagree) to 6 (strongly agree). The items of which the scores should be reversed are indicated by (r). A higher total score indicates greater trait skepticism.

1. I often accept other peoples' explanations without further thought. (r)
2. I feel good about myself.
3. I wait to decide on issues until I can get more information.
4. The prospect of learning excites me.
5. I am interested in what causes people to behave the way that they do.
6. I am confident of my abilities.
7. I often reject statements unless I have proof that they are true.
8. Discovering new information is fun.
9. I take my time when making decisions.
10. I tend to immediately accept what other people tell me. (r)
11. Other peoples' behavior doesn't interest me. (r)
12. I am self-assured.
13. My friends tell me that I usually question things that I see or hear.
14. I like to understand the reason for other peoples' behavior.
15. I think that learning is exciting.
16. I usually accept things I see, read or hear at face value. (r)
17. I don't feel sure of myself. (r)
18. I usually notice inconsistencies in explanations.
19. Most often I agree with what the others in my group think. (r)
20. I dislike having to make decisions quickly.
21. I have confidence in myself.
22. I don't like to decide until I've looked at all of the readily available information.
23. I like searching for knowledge.
24. I frequently question things that I see or hear.
25. It is easy for other people to convince me. (r)
26. I seldom consider why people behave in a certain way. (r)
27. I like to ensure that I've considered most available information before making a decision.
28. I enjoy trying to determine if what I read or hear is true.
29. I relish learning.
30. The actions people take and the reasons for those actions are fascinating.

**PROFESSIONAL MORAL COURAGE SCALE (PMC) (Cronbach's alpha = 0.91)**

The Professional Moral Courage scale (Serkerka et al., 2009) consists of 15 Items scored on a 7-point scale, ranging from 1 (never true) to 7 (always true). Respondents are asked to evaluate these statements as they pertain to them at work. Adding up the points for each item and dividing the total by 15 provides the moral courage score. A higher total score indicates greater moral courage and willingness to take skeptical action.

1. I am the type of person who is unfailing when it comes to doing the right thing at work.
2. When I do my job I regularly take additional measures to ensure my actions reduce harms to others.
3. My work associates would describe me as someone who is always working to achieve ethical performance, making every effort to be honorable in all my actions.
4. I am the type of person who uses a guiding set of principles from the organization when I make ethical decisions on the job.
5. No matter what, I consider how both my organization's values and my personal values apply to the situation before making decisions.
6. When making decisions I often consider how my role in the organization, my command, and my upbringing must be applied to any final action.
7. When I encounter an ethical challenge I take it on with moral action, regardless of how it may pose a negative impact on how others see me.
8. I hold my ground on moral matters, even if there are opposing social pressures.
9. I act morally even if it puts me in an uncomfortable position with my superiors.
10. My coworkers would say that when I do my job I do more than follow the regulations, I do everything I can to ensure actions are morally sound.
11. When I go about my daily tasks I make sure to comply with the rules, but also look to understand their intent, to ensure that this is being accomplished as well.
12. It is important that we go beyond the legal requirements but seek to accomplish our tasks with ethical action as well.
13. It is important for me to use prudential judgment in making decisions at work.
14. I think about my motives when achieving the mission, to ensure they are based upon moral ends.
15. I act morally because it is the right thing to do.

**ROTTER INTERPERSONAL TRUST SCALE (RIT-Distrust) (Cronbach's alpha = 0.76)**

Rotter's Interpersonal Trust scale consists of 25 items that are scored on a 5-point Likert Scale (varying from strongly disagree to strongly agree). We gathered scale items from Wrightsman (1991). The items of which the scores should be reversed are indicated by (r). Adding up the points for each item provides the interpersonal trust score. Higher scores indicate higher interpersonal trust. We use the reversed score on Rotter's Interpersonal Trust Scale to measure distrust; higher scores indicate greater distrust.

1. Hypocrisy is on the increase in our society. (r)
2. In dealing with strangers one is better off to be cautious until they have provided evidence that they are trustworthy. (r)
3. This country has a dark future unless we can attract better people into politics. (r)
4. Fear and social disgrace or punishment rather than conscience prevents most people from breaking the law. (r)
5. Using the honor system of not having a teacher present during exams would probably result in increased cheating. (r)
6. Parents usually can be relied on to keep their promises.
7. The United Nations will never be an effective force in keeping world peace. (r)
8. The judiciary is a place where we can all get unbiased treatment.
9. Most people would be horrified if they knew how much news that the public hears and sees is distorted. (r)
10. It is safe to believe that in spite of what people say most people are primarily interested in their own welfare. (r)
11. Even though we have reports in newspapers, radio, and TV, it is hard to get objective accounts of public events. (r)
12. The future seems very promising.
13. If we really knew what was going on in international politics, the public would have reason to be more frightened than they now seem to be. (r)
14. Most elected officials are really sincere in their campaign promises.
15. Many major national sports contests are fixed in one way or another. (r)
16. Most experts can be relied upon to tell the truth about the limits of their knowledge.
17. Most parents can be relied upon to carry out their threats or punishments.
18. Most people can be counted on to do what they say they will do.
19. In these competitive times one has to be alert or someone is likely to take advantage of you. (r)
20. Most idealists are sincere and usually practice what they preach.
21. Most salesmen are honest in describing their products.
22. Most students in school would not cheat even if they sure of getting away with it.
23. Most repairmen will not overcharge even if they think you are ignorant of their specialty.
24. A large share of accident claims filed against insurance companies are phony. (r)
25. Most people answer public opinion polls honestly.

## **PERSONALITY TRAITS**

The Ten-Item Personality Inventory (Gosling et al. 2003) consists of 10 items scored on a 7-point Likert Scale (varying from strongly disagree to strongly agree). The items of which the scores should be reversed are indicated by (r). Adding up the scores results in a score for *EXTRAVERSION* (1, 6), *AGREEABLENESS* (2, 7), *CONSCIENTIOUSNESS* (3, 8), *EMOTIONALSTABILITY* (4, 9) and *OPENNESS* to experiences (5, 10).

Here are a number of personality traits that may or may not apply to you. Please indicate to what degree you agree with the following statements. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

1. Extraverted, enthusiastic.
2. Critical, quarrelsome. (r)
3. Dependable, self-disciplined.
4. Anxious, easily upset. (r)
5. Open to new experiences, complex.
6. Reserved, quiet. (r)
7. Sympathetic, warm.
8. Disorganized, careless. (r)
9. Calm, emotionally stable.
10. Conventional, uncreative. (r)

The Short Dark Triad (Jones and Paulhus 2014) consists of 27 items scored on a 5-point Likert Scale (varying from strongly disagree to strongly agree). The items of which the scores should be reversed are indicated by (r). The sum of scores indicates *MACHIAVELLIANISM* (1-9), *NARCISSISM* (10-18) and *PSYCHOPATHY* (19-27).

Please indicate to what degree you agree with the following statements.

### **MACHIAVELLIANISM:**

1. It's not wise to tell your secret.
2. I like to use clever manipulation to get my way.
3. Whatever it takes, you must get the important people on your side.
4. Avoid direct conflict with others because they may be useful in the future.
5. It's wise to keep track of information that you can use against people later.
6. You should wait for the right time to get back at people.
7. There are things you should hide from other people because they don't need to know.
8. Make sure your plans benefit you, not others.
9. Most people can be manipulated.

### **NARCISSISM:**

10. People see me as a natural leader.
11. I hate being the center of attention. (r)
12. Many group activities tend to be dull without me.

13. I know that I am special because everyone keeps telling me so.
14. I like to get acquainted with important people.
15. I feel embarrassed if someone compliments me. (r)
16. I have been compared to famous people.
17. I am an average person. (r)
18. I insist on getting the respect I deserve.

**PSYCHOPATHY:**

19. I like to get revenge on authorities.
20. I avoid dangerous situations. (r)
21. Payback needs to be quick and nasty.
22. People often say I'm out of control.
23. It's true that I can be mean to others.
24. People who mess with me always regret it.
25. I have never gotten into trouble with the law. (r)
26. I enjoy having sex with people I hardly know.
27. I'll say anything to get what I want.

**AUDIT KNOWLEDGE**

We measure audit experience with respect to valuation, fraud, and analytical procedures. We use 3 items scored on a 7-point Likert Scale (varying from not at all experienced to extremely experienced). Higher scores indicate greater experience along these dimensions.

Indicate the amount of experience you have with respect to the following issues:

1. Difficult accounting measurement and valuation problems. (*KNOW\_VALUATION*)
2. The assessment of risks of material misstatements due to fraud. (*KNOW\_FRAUD*)
3. The application of analytical procedures during an audit. (*KNOW\_ANALYTICAL\_PROC*)

**ATTITUDE** (Cronbach's alpha = 0.62)

To measure attitude towards professional skepticism, we composed a question consisting of 5 items scored on a 7-point Scale. The items of which the scores should be reversed are indicated by (r). Higher scores indicate a more positive attitude towards professional skepticism.

I think maintaining professional skepticism throughout an audit engagement is:

1. good – bad. (r). Mean = 6.49; Factor loading = 0.79
2. harmful – beneficial. Mean = 5.87; Factor loading = 0.62
3. pleasant (for me) – unpleasant (for me). (r). Mean = 5.44; Factor loading = 0.48
4. difficult – easy. Mean = 4.11; Factor loading = 0.18
5. unimportant – important. Mean = 6.49; Factor loading = 0.60

**SUBJECTIVE NORM (SN) (Cronbach's alpha = 0.71)**

We measure subjective norm based on the work of Ajzen (1991, 2006), including 3 items scored on a 7-point Likert Scale (varying from strongly disagree to strongly agree). Higher scores indicate greater perceived social pressure to engage in skeptical behavior.

To what extent do you agree with the following statements?

1. Most people who are important to me within my firm would encourage me to maintain professional skepticism throughout an audit. Mean = 5.79; Factor loading = 0.64.
2. Most people like me maintain professional skepticism throughout an audit. Mean = 5.71; Factor loading = 0.73.
3. It is expected of me that I maintain professional skepticism throughout an audit. Mean = 6.18; Factor loading = 0.67.

**PERCEIVED BEHAVIORAL CONTROL (PBC) (Cronbach's alpha = 0.34)**

We measure perceived behavioral control based on the work of Ajzen (1991, 2006), including 3 items scored on a 7-point Likert scale (varying from strongly disagree to strongly agree). The items of which the scores should be reversed are indicated by (r). Higher scores indicate a greater sense of perceived behavioral control.

To what extent do you agree with the following statements?

1. Maintaining professional skepticism throughout an audit or not is entirely up to me. (r) Mean = 4.07; Factor loading = 0.25.
2. I am confident that I can maintain professional skepticism throughout an audit. Mean = 5.89; Factor loading = 0.15.
3. Maintaining professional skepticism throughout an audit is beyond my control. (r) Mean = 5.30; Factor loading = 0.94.

**AUDIT FIRM TONE AT THE TOP**

We measure the relative extent of audit firm ethical tone at the top based on Sweeney et al. 2010, whereby the measure consists of 4 items scored on a 7-point Likert scale (varying from strongly disagree to strongly agree). The items of which the scores should be reversed are indicated by (r). We use the reversed score to measure tone at the top. Higher scores indicate a more ethical perceived tone at the top.

To what extent do you agree with the following statements?

1. In my firm, I sometimes perceive that senior managers engage in behaviors that I consider to be unethical. (r) Mean = 5.45
2. In my firm, I sometimes perceive that partners engage in behaviors that I consider to be unethical. (r) Mean = 5.36

3. In my firm, top management has let it be known in no uncertain terms that unethical behaviors will not be tolerated. Mean = 5.47
4. My firm is known as a leader in promoting professional ethics within the profession. Mean = 5.08

### **TIME BUDGET PRESSURE**

Time budget pressure consists of 3 items scored on a 7-point Likert Scale (varying from strongly disagree to strongly agree). The items of which the scores should be reversed are indicated by (r). Adding up the scores results in a score for perceived pressure. Higher scores indicate a higher perceived pressure.

To what extent do you agree with the following statements?

1. I felt pressure from the budget I was working on. Mean = 3.43
2. I felt that the time budget was unattainable. Mean = 3.59
3. I finished my work within the allotted time budget. (r) Mean = 4.18

### **SKEPTICAL ACTIONS**

We measure skeptical action using nine questions based on the work of Robinson et al. (2018), which are scored on a 7-point scale (varying from strongly disagree to strongly agree). Higher scores indicate greater levels of skeptical action on the audit engagement.

### **SEARCHING FOR INFO** (Cronbach's alpha = 0.78)

1. I actively sought out all of the information that I could. Mean = 5.52; Factor loading = 0.73
2. I used all resources available to me to get all of the information that I could. Mean = 5.64; Factor loading = 0.65

### **QUESTIONING** (Cronbach's alpha = 0.77)

3. I had a tendency to reject statements unless I had proof that they were true. Mean = 5.28; Factor loading = 0.68
4. I frequently questioned the things that I saw or read. Mean = 5.59; Factor loading = 0.79
5. I tended to question the statements that I read from this client. Mean = 5.30; Factor loading = 0.72

### **SUSPENDING JDGMT** (Cronbach's alpha = 0.84)

6. I tried to ensure that I had considered most available information before making a decision. Mean = 5.86; Factor loading = 0.79
7. I did not like deciding until I had a chance to look at all of the available information. Mean = 5.61; Factor loading = 0.68
8. I took my time when making decisions. Mean = 5.69; Factor loading = 0.81

9. I waited to make decisions until I could get more information. Mean = 5.56; Factor loading = 0.75