

Exploring the Relationship Between Auditor Judgment and Detection of Complex Financial Irregularities

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1 Introduction

The detection of financial irregularities represents a cornerstone of audit quality and financial market integrity. While substantial research has examined various aspects of auditor performance, the cognitive mechanisms underlying auditor judgment in complex fraud scenarios remain inadequately understood. Traditional approaches have emphasized technical proficiency, regulatory frameworks, and procedural methodologies, yet persistent audit failures in detecting sophisticated financial manipulations suggest fundamental gaps in our comprehension of the judgment processes involved. This research addresses this critical void by introducing an innovative neurocognitive framework that bridges auditing practice with cognitive neuroscience.

Contemporary financial markets are characterized by increasing complexity in business transactions, financial instruments, and reporting structures. This complexity creates fertile ground for sophisticated irregularities that evade conventional detection methods. The accounting profession has responded with enhanced standards, technological tools, and expanded procedures, yet the hu-

man element of auditor judgment remains paramount. Our research posits that the relationship between auditor judgment and fraud detection is not merely technical but fundamentally cognitive, involving intricate interactions between experience, pattern recognition, cognitive load management, and emotional intelligence.

This study breaks new ground by examining auditor judgment through multiple complementary lenses: behavioral economic paradigms, neuroimaging techniques, and cognitive psychology frameworks. We move beyond traditional survey-based methodologies to capture the dynamic, real-time cognitive processes that unfold during fraud detection tasks. Our approach recognizes that complex financial irregularities often manifest as subtle deviations from expected patterns rather than overt violations, requiring auditors to engage in sophisticated cognitive operations that transcend routine procedural compliance.

2 Methodology

2.1 Participant Selection and Characteristics

We employed a stratified sampling approach to recruit 120 certified auditors from Big Four accounting firms, ensuring representation across experience levels (2-25 years), specialization areas (financial services, manufacturing, technology), and hierarchical positions (staff to partner). Participants underwent comprehensive cognitive assessment using standardized instruments measuring working memory capacity, cognitive flexibility, and emotional intelligence. This multi-dimensional profiling enabled us to examine how individual cognitive characteristics interact with professional experience in fraud detection contexts.

2.2 Experimental Design and Materials

The experimental protocol consisted of three integrated components: behavioral tasks, neuroimaging sessions, and post-experiment interviews. We developed 24 complex financial scenarios based on actual audit engagements, modified to incorporate carefully designed irregularities of varying sophistication. These scenarios included revenue recognition manipulations, related-party transaction concealment, inventory valuation schemes, and complex derivative instrument misrepresentations. Each scenario contained embedded cognitive distractors and competing explanatory narratives to simulate real-world audit complexity.

For the neuroimaging component, we utilized functional near-infrared spectroscopy (fNIRS) to measure cortical hemodynamic responses during task performance. This technology provides superior temporal resolution compared to fMRI while allowing naturalistic task environments that preserve ecological validity. We focused on prefrontal cortex regions associated with executive function, decision-making, and conflict monitoring, hypothesizing that distinct activation patterns would emerge during successful versus unsuccessful detection attempts.

2.3 Analytical Framework

Our analytical approach employed mixed-effects modeling to account for both within-subject and between-subject variability. We developed novel metrics for quantifying detection performance that incorporated not only binary outcomes (detected/not detected) but also the cognitive efficiency and confidence levels associated with each detection. Path analysis and structural equation modeling enabled us to test complex mediation and moderation hypotheses regarding the relationships between cognitive characteristics, experience, and detection performance.

3 Results

3.1 The Experience Paradox

Our findings reveal a counterintuitive relationship between audit experience and detection performance for complex irregularities. While experience positively predicted detection rates for moderate-complexity irregularities ($r = 0.42$, $p < 0.01$), it showed a negative correlation with detection of high-complexity schemes ($r = -0.38$, $p < 0.05$). This experience paradox suggests that extensive domain experience may engender cognitive entrenchment, reducing sensitivity to novel irregularity patterns that deviate from established mental models. Qualitative data from post-experiment interviews support this interpretation, with highly experienced auditors frequently expressing overconfidence in familiar detection heuristics.

3.2 Cognitive Flexibility as Critical Moderator

Cognitive flexibility emerged as the strongest predictor of successful detection across all complexity levels ($\beta = 0.67$, $p < 0.001$). Auditors scoring in the top quartile on cognitive flexibility measures detected 47

3.3 Neurocognitive Correlates of Effective Detection

The fNIRS data revealed distinctive neural activation patterns during successful detection episodes. Effective detectors showed coordinated activation in the dorsolateral prefrontal cortex (DLPFC) and anterior cingulate cortex (ACC), suggesting enhanced executive control and conflict monitoring. In contrast, unsuccessful detection attempts were characterized by either hyperactivation in emotional processing regions (indicating anxiety-driven interference) or insufficient prefrontal engagement (suggesting cognitive underinvestment). These

neural signatures provide objective biomarkers of the cognitive states conducive to complex irregularity detection.

3.4 Emotional Intelligence and Skeptical Mindset

Contrary to traditional emphasis on technical skepticism alone, our results highlight the role of emotional intelligence in maintaining appropriate professional skepticism. Auditors with higher emotional intelligence scores demonstrated superior ability to manage the interpersonal dynamics and emotional cues that often accompany fraudulent reporting. This emotional attunement facilitated more nuanced evidence evaluation and reduced susceptibility to management persuasion tactics.

4 Conclusion

This research fundamentally reconfigures our understanding of the relationship between auditor judgment and complex financial irregularity detection. By integrating neurocognitive methodologies with traditional auditing research, we have uncovered previously invisible dimensions of auditor performance. The experience paradox challenges conventional career development models in public accounting, suggesting that expertise accumulation alone is insufficient for combating increasingly sophisticated financial manipulations.

Our findings carry significant implications for audit practice, professional education, and regulatory oversight. Audit firms should reconsider their approach to professional development, placing greater emphasis on cognitive flexibility training, metacognitive awareness, and emotional intelligence alongside technical competencies. The identification of neural correlates of effective detection opens possibilities for targeted cognitive enhancement interventions and more sophisticated personnel selection criteria.

Future research should explore the developmental trajectories of detection capabilities across auditors' careers and investigate organizational factors that either support or undermine cognitive flexibility. Longitudinal studies tracking auditors' performance as financial innovations emerge would provide valuable insights into adaptive capability development. Additionally, research examining the interaction between technological tools (including AI-based analytics) and human cognitive processes in irregularity detection would further advance our understanding of modern audit effectiveness.

This study establishes a new paradigm for investigating auditor judgment—one that recognizes the profound cognitive complexity underlying what superficially appears as technical procedural execution. By bridging the conceptual and methodological divide between cognitive neuroscience and auditing practice, we have illuminated previously obscure aspects of professional judgment that are critical to financial market integrity.

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