

Practice Note

**Inheriting vs. Developing Data Analytic Tests and Auditors' Professional Skepticism**

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## **Inheriting vs. Developing Data Analytic Tests and Auditors' Professional Skepticism**

### **Executive Summary**

Auditors' use of audit data analytic (ADA) tests carries tremendous potential for the quality of financial statement audits and auditors' application of professional skepticism (e.g., Austin, Carpenter, Christ, and Nielson 2021). As the use of ADA tests becomes increasingly established in practice, auditors will likely transition from *developing* ADA tests themselves to a situation where they typically *inherit* ADA tests developed by others. For example, auditors may inherit ADA tests that are developed by other members of their audit team or their firm's centralized analytics team.

In this study, we argue that inheriting ADA tests, as opposed to developing ADA tests by themselves, hinders auditors' application of professional skepticism because inheriting decreases auditors' psychological ownership of the tests. In an experiment where an ADA test identifies a fraud red flag, we find that auditors who *inherited* the ADA test are less skeptical than those who personally *developed* the ADA test. We further provide evidence that *informing* auditors who inherited the ADA test about the test development activities can substantially boost auditors' skepticism levels. In practice, this development-related information could be conveyed via an ADA test development memorandum preceding the workpapers containing the ADA test. Informing auditors about ADA test development activities will likely become more important as auditors inherit more advanced forms of ADA tests, such as tests employing artificial intelligence technology.

#### **Main Takeaways**

- Auditors' professional skepticism decreases when they use an ADA test inherited from others, as opposed to an ADA test they developed themselves.
- Inheriting an ADA test hinders professional skepticism because it decreases auditors' psychological ownership of the ADA tests.
- Informing auditors about the ADA test development activities can increase professional skepticism when they inherit an ADA test.

**Keywords:** audit data analytics, fraud red flag, professional skepticism, psychological ownership, test development

## The Issue

As the use of ADA becomes increasingly common and established in audit practice, auditors will very often inherit and use ADA developed by others, rather than developing the ADA tests themselves. These “others” could be another team member or a centralized data analytics team. Indeed, audit firms have begun to centralize functions specializing in the development of audit tests using advanced technologies. As such, inheriting ADA tests is likely to become commonplace in future audit practice. Although such a move potentially benefits audit efficiency, we suggest that inheriting ADA tests from others can impair an auditor’s psychological ownership of the ADA test, potentially resulting in lower levels of auditor skepticism when the ADA identifies a red flag or evidence inconsistency.

Psychology theory suggests that auditors’ psychological ownership of an ADA test develops through three paths that strengthen as auditors’ personal involvement increases: control over the ADA test, being associated with the ADA test, and investing the self into the ADA test (e.g., Pierce, Kostova, and Dirks 2001). When auditors inherit the ADA test, they potentially miss out on all three routes to psychological ownership. Due to the diminished feelings of responsibility and commitment to the ADA test, auditors inheriting an ADA test are less likely to investigate red flags identified by the ADA (i.e., a decrease in skeptical action).

We propose that a potential remedy for the adverse effects of inheriting ADA tests is to explicitly inform auditors about the ADA test development activities. In practice, this development-related information could be conveyed via an *ADA test development memorandum* (ADA memo) preceding the workpapers where the ADA test is used. Such an ADA memo would include information such as the number of hours spent, data reliability testing, and diagnostics performed. This information in turn is expected to increase auditors’ intimate knowledge about the ADA test and hence their psychological ownership of the test. We therefore expect that being informed about the development activities of the ADA test will counter the adverse effect of inheriting ADA tests.

Overall, we seek to answer the following questions:

- Does inheriting an ADA test, compared to engaging in the development of the ADA test, decrease auditors’ application of professional skepticism when the ADA test identifies a red flag?

- Does informing auditors who inherited an ADA test about the test development activities improve their application of professional skepticism when the ADA test identifies a red flag?

## **Methodology**

We conducted an online experiment with 173 experienced senior-level auditors in the Netherlands from Big-Four and medium-sized international firms. In a hypothetical audit case, participants performed a substantive analytical procedure related to a sales account. After receiving background information, participants learned that the audit team had recently incorporated data analytic visualizations for the current year audit. Prior to presenting the visualizations, we randomly assigned participants to one of three conditions: (1) requiring participants to engage actively in the ADA visualization development activities, (2) telling them that the visualizations had been previously developed by another audit team member, or (3) telling participants that the ADA visualizations were developed by another audit team member but providing an ADA memo documenting the ADA visualization development activities.

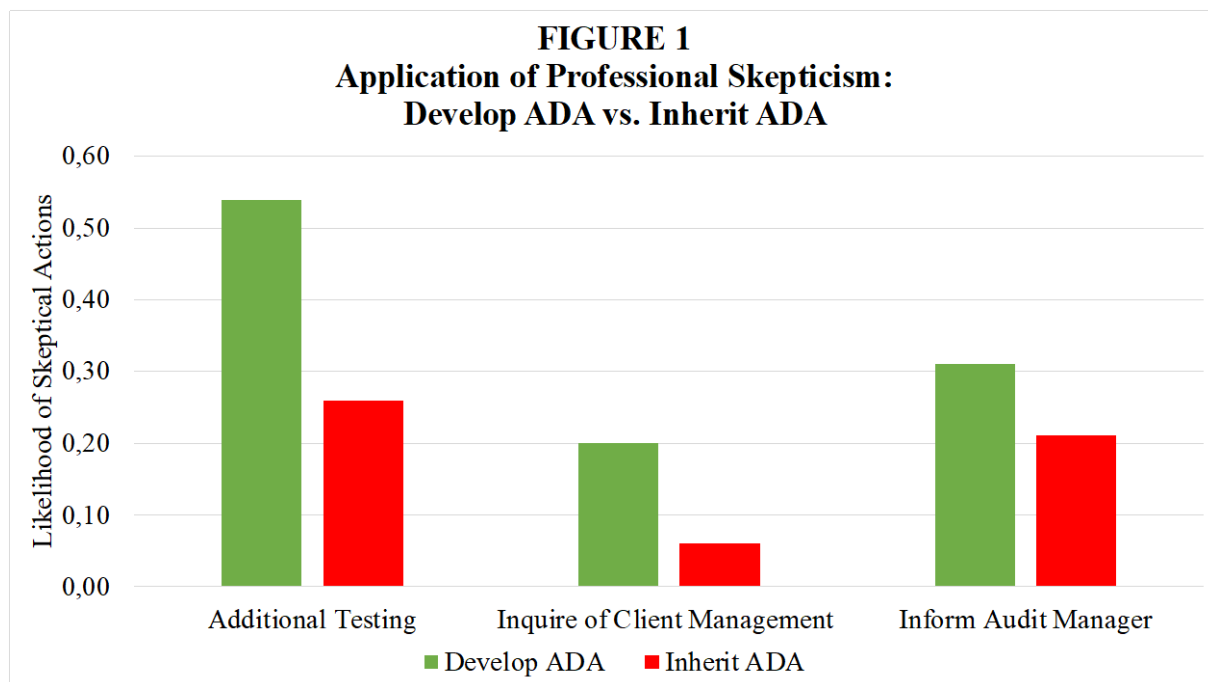
Participants were then provided with five ADA visualizations presenting a rich five-year time series of financial and non-financial data from five different sources (e.g., prior year balances, budgets, industry trends, etc.). One visualization revealed a sharp decline in the client's current year non-financial measures (NFM) such as number of customers, number of patents, creating a red flag for financial statement fraud (Brazel, Jones, and Zimbelman 2009).

Participants were asked to develop an expectation for the sales account and compare the expectation to the recorded balance. Our primary measure of skeptical action is participants' conclusion as to whether additional testing related to the analytical procedure was needed (yes or no). Participants were also asked about what additional testing they would perform and/or what questions they would ask of client management, as well as whether there was anything that they would communicate to their audit manager.

## **Findings**

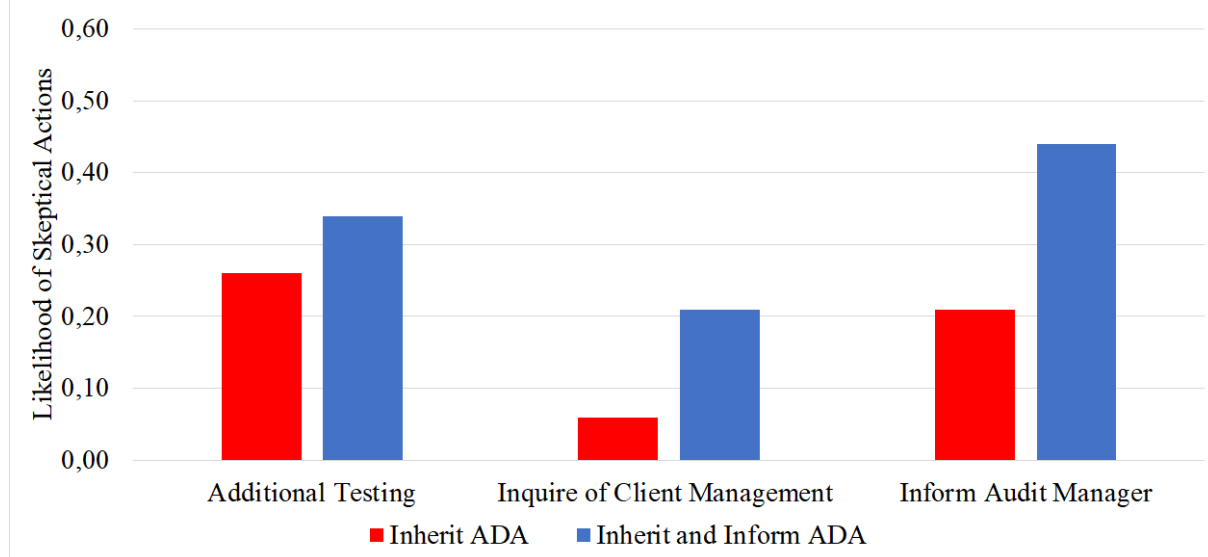
We find that auditors who inherit an ADA test, compared to auditors who are personally involved in the development of the ADA test, are overall less likely to exercise professional skepticism (see Figure 1). Specifically, auditors who inherited the ADA visualizations are less likely to recommend additional work related to the analytical procedure than those who personally developed the visualizations. They are also less likely to either inquire of client

management about the NFM red flag and/or inform their audit manager about the NFM red flag (vs. auditors who personally developed the visualizations). This effect can be explained by their lack of psychological ownership of the ADA tests. Inheriting an ADA test from someone else, compared to personally engaging in the development of the ADA test, decreases auditors' psychological ownership of the ADA test, reducing their skeptical action when the ADA identifies a fraud red flag.



We also find that *informing* auditors about the ADA test development activities appears to be effective as it boosts the skeptical actions of auditors who inherit the ADA test (see Figure 2). Specifically, informing auditors about ADA test development increases their likelihood of inquiring of client management about the NFM red flag or informing their manager about the NFM red flag, compared to not receiving such information when inheriting an ADA test.

**FIGURE 2**  
**Application of Professional Skepticism:**  
**Inherit ADA vs. Inherit and Inform ADA**



### **Conclusion and Relevance to Audit Practice**

Although ADA tests are expected to improve auditors’ professional skepticism, we demonstrate that the effectiveness of ADA tests depends on auditors’ involvement in the development of these tests. Our study illustrates that the full benefits of utilizing ADA tests may not be realized when auditors inherit ADA from others, a likely situation as ADA becomes more commonplace in audit practice. Therefore, we address the added challenges ADA brings to auditor skepticism. This study highlights the importance of the “human” side when implementing ADA tests. Despite the technical features of ADA, we provide insights on the importance of auditors’ engagement with and feeling of ownership of ADA tests.

Our findings have important implications for audit firms regarding their data analytics practices. Current education and training of the next generation of auditors increasingly emphasizes technology and data science, with the intent to prepare auditors to incorporate their own ADA tests into their work. This education and training also matches the younger generations’ inherent interest in new technologies and innovations. Having audit professionals participate more in ADA test development activities could therefore help audit firms attract and retain talented professionals and combat the deepening shortage of auditors. However, audit firms are potentially moving towards centralizing and specializing their ADA test development activities within their firms (e.g., Fedyk, Hodson, Khimich, and Fedyk 2022). Although such a move potentially benefits audit efficiency, we demonstrate that auditor skepticism may suffer when inheriting ADA tests developed by someone else. As such, our

remedy of an ADA development memo may become even more crucial as auditors in the field inherit even more advanced forms of ADA tests, such as tests employing artificial intelligence technology.

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