Bias Inoculation Advanced Simulation (BIAS) Training

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1. Introduction

1.1. Bias as an Intelligence Analysis Risk

Bias poses a threat to the quality of intelligence data and to its analysis (Heuer, 1999), and can have unfortunate consequences for the implementation of the decision. Bias is particularly a risk for collective decision-making, especially when intelligence collection and analysis are performed by people other than the decision-maker.

1.2. Simulating Human Behavior for Training Collective Intelligence Analysis Processes

Intelligence analysis is part of a collective decision-making process for organizations. The sophistication and proliferation of intelligence sources means that intelligence gathering and analysis is itself a collective process that requires training and deliberate practice for individuals to become proficient.

There is a need for cost-effective training for individual students to prepare them for collective tasks. Common current training strategies of intense and expensive collective training events are a better alternative than on-the-job training when bad decisions can lead to disasters. However, they represent an inefficient use of role-playing personnel as a means for the students to come up to speed on their individual staff skills.

Simulations of intelligence analysis staffs can allow individuals to practice their skills. Part of this training is helping learners to recognize bias and counterbalance its effects. Individual learning objectives include: Understanding the flow of information required from multiple sources to provide an accurate basis for decision-making; understanding team roles, or correspondingly the capabilities of colleagues with different sub-specialties, particularly what kinds of information they can provide to support the decision-making and what communication approaches are appropriate; ensuring that the decision-making documents are consistent with the source information; and recognizing bias in team members' analysis and using the structure of the decision-making process to reduce the risk of bias.

2. Simulating Biased Analysis Behavior

A number of biases derive from the heuristics that individuals use to make decisions and reason under constraints of uncertainty, incomplete knowledge, time, or accountability. A sample of biases that could seep into the intelligence products (see Hubal, Staszewski, & Marrin, 2007, for a more comprehensive list) includes information order, confirmation, accessibility, and process biases.

The authors are part of a team that developed a simulation for training individual staff members to prepare them for collective decision-making. The simulation immerses the student in the preparation of decision-making documents. The student prepares documents (called "student products") by finding and integrating information found in various source documents, including documents provided by other persons. A key part of the training is communication with appropriate team members to obtain needed source documents and other forms of information.

The simulation uses political, military, economic, and social analytic categories (PMES) as functional areas. A lesson footprint was based on the CIA seven-step analysis process (see McCue, 2007), and incorporated one live and six simulated roles: A junior Intelligence analyst (the student); a specialist in the political affairs of the country of interest; a specialist in the military affairs of the country of interest; a specialist in the economic affairs of the country of interest; a country HUMINT specialist; an IMINT specialist, particularly for satellite and aerial photography; and a SIGINT specialist, particularly for radio traffic and cell phone messages. The simulation focuses on a single student product, called a *National Intelligence Estimate*, that presents a "Key Estimative Question", the basis for the product, and then an overview section and subsections for PMES analyses from which the student selects given a multitude of choices. The student is responsible for filling in these items and identifying supporting data. In the simulation, relevant source documents as well as the current state of student products are available to the student through access to a portal. Portal information is updated by the simulated roles in response to communications from the student. The student communicates with the simulated roles through e-mail or a chat tool (as a proxy for face-to-face interactions), and the simulated roles communicate in a similar fashion, as well as by updating documents in the portal.

The simulation provides just-in-time assessment and feedback to the student using a modified after-action review (AAR) report (Frank et al., 2004). New assessment methods focus on validating the consistency of elements of the student products with appropriate source documents, to include assessing influences of biased analyses. This approach has been enhanced to include information about the state of the simulated roles as well as the final state of the student product. The approach to just-in-time feedback was to "mark up" the student products. Since these applications train processes rather than sequential procedures, the assessment focuses both on student actions and on the end-state of documents created by the student (i.e., student products). The traditional AAR is presented in terms of critical tasks and performance measures; in contrast, just-in-time feedback is presented in terms of each section of the student document, similar to a marked up assignment being returned to the student. Semantically-rich techniques for providing intelligent tutoring are being developed.

3. References

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Author Biographies

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ROB HUBAL is a cognitive scientist in RTI's Center for Distributed Learning. He holds a Ph.D. in cognitive psychology from Duke University. He is co-developer of software that enables simulated roles to act and behave realistically in controlled learning and assessment contexts. He is also interested in experimental evaluations of the usability, acceptance, and cost-effectiveness of training and assessment systems and their applications to everyday domains.