

Improving Intelligence Analysis with ACH

by Richards J. Heuer, Jr.

Richards Heuer is the author of Psychology of Intelligence Analysis (CIA Center for the Study of Intelligence, 1999). His book is used throughout the Intelligence Community for training intelligence and counterintelligence analysts. It is available from the U.S. Government Printing Office and on the CSI website at www.odci.gov/csi/pubs.html. Mr. Heuer has 53 years of experience in intelligence and security work for CIA and Department of Defense.

When officials in the Intelligence Community speak of improving intelligence analysis, they usually focus on relations between intelligence analysts and intelligence consumers, types of analytical products, organization of the analytical process, the quality of writing, or providing language and area studies to improve substantive expertise. When policy makers talk about improving intelligence analysis, they focus on moving boxes on an organization chart, Congressional oversight, and whatever it was that caused the most recent intelligence failure.

The real key to improving intelligence analysis is to attack the problem at its roots – the mindset that guides and influences analysts as they make probabilistic judgments about the unknown. To avoid surprise in a rapidly changing world, intelligence analysts need to develop habits of mind and use analytical tools that help them be the first to recognize that old assumptions may no longer apply. They must learn to recognize when underlying conditions have changed so much that their mindset, which has served them so well in the past, may no longer be appropriate. On a personal level, they need to learn how to recognize when to change their mind.

Training of Intelligence Community analysts already emphasizes the need to question assumptions, but this is easier said than done and often overlooked due to the pressure of reporting deadlines or the analyst's confidence that he or she already knows the right answer. In her February 11, 2004, address to employees of the CIA Directorate of Intelligence, the Deputy Director for Intelligence (DDI) stated: "I want to focus on the danger of inherited assumptions. That may be the single most important aspect of our work that needs to be examined.... How do we ensure that we are not passing along assumptions that haven't been sufficiently questioned or examined?"¹

The Intelligence Community has a number of established analytical tools or tradecraft procedures that are designed to help analysts question assumptions and adjust their mindsets. These include:

- Red Cell Analysis (trying to predict the behavior of others by putting yourself in their shoes)
- Devil's Advocacy (assigning someone to challenge a single, strongly held consensus by building the best possible case for an alternative explanation)
- Brainstorming (an unconstrained group process for generating new ideas and concepts)
- What If? Analysis (taking as a given that an unexpected event has occurred and then trying to explain how it could have come about, also known as Thinking Backwards).
- Alternative Futures Analysis (applies the collective knowledge and imagination of a group of experts to identify driving forces that are likely to shape an issue and how these different forces – when given different weights – might play out in plausible future scenarios)
- Analysis of Competing Hypotheses (discussed below).

Although these tools exist, there is no established procedure for determining when they get used. CIA analysts are trained in these and other approaches to challenging assumptions in a course that is called, interestingly, “Alternative Analysis.” One goal for improving analysis might be to get to the point where the term “Alternative Analysis” no longer applies, because these methods have become mainstream.

Authors of the recent *9/11 Commission Report* determined that it is “...crucial to find a way of routinizing, even bureaucratizing, the exercise of imagination.”ⁱⁱ Although that was written in a somewhat different context, it also applies to intelligence analysis in general. Tools for challenging assumptions and for generating alternative hypotheses, or alternative scenarios, will be widely used only if Intelligence Community managers establish policies and institutionalize procedures to ensure that these tools are used whenever analysts are dealing with important issues where we can't afford to be wrong.

Analysis of Competing Hypotheses

One of the tools of alternative analysis that warrants increased use is Analysis of Competing Hypotheses, often abbreviated ACH. This takes the analyst through a structured, eight-step analytical process that differs from conventional intuitive analysis and is less prone to analytical error.

In conventional intuitive analysis, analysts generally start by identifying what appears to be the most likely hypothesis – that is, the tentative estimate, explanation, or description of the situation that appears most likely. Information is then collected and organized according to whether or not it supports this tentative judgment. Careful analysts will make a quick review of other possible hypotheses and of evidence not accounted for by the preferred hypothesis to ensure that they have not overlooked some important

consideration. If the evidence seems to support the favorite hypothesis, analysts pat themselves on the back (“See, I knew it all along!”) and look no further. If it does not, they either reject the evidence as misleading or develop another hypothesis and go through the same procedure again.

This is quite different from the ACH procedure, which is grounded in basic insights from cognitive psychology, decision analysis, and the scientific method. ACH is designed to help intelligence analysts overcome, or at least minimize, some of the cognitive limitations discussed in this article that make accurate intelligence analysis so difficult. The following elements distinguish Analysis of Competing Hypotheses from conventional intuitive analysis.

- Analysis starts with a brainstorming session to identify a full set of alternative hypotheses, rather than with a most likely alternative for which the analyst seeks confirmation. This ensures that alternative hypotheses receive equal treatment.
- The analyst creates a matrix with hypotheses listed across the top and evidence listed down the side. “Evidence” is interpreted very broadly to include assumptions and logical deductions as well as hard intelligence reporting – anything that influences the analyst’s judgment about any of the hypotheses. For each item of evidence, the analyst asks the following question for each hypothesis: If this hypothesis were true, is it likely that I would be seeing this item of evidence? The analyst notes in the matrix an evaluation of each item of evidence against each hypothesis. This identifies and highlights the few items of evidence or assumptions that have the greatest diagnostic value in judging the relative likelihood of the various hypotheses.
- Analysis follows the fundamental precept of the scientific method that one should proceed by rejecting or eliminating hypotheses, while tentatively accepting only those hypotheses that cannot be refuted. The most probable hypothesis is the one with the least evidence against it, not the one with the most evidence for it. The statistical procedures of scientific methodology are not applicable to most types of problems that intelligence analysts deal with, but analysts can and should adopt the conceptual strategy of seeking disconfirming rather than only confirming evidence.

ACH assures that alternative hypotheses get a fair shake in the analysis. It systematically identifies the intelligence reporting and the assumptions and logical deductions that have the greatest impact on the analyst’s judgment concerning the relative probability of each hypothesis. In other words, it identifies and highlights those assumptions that need to be questioned and rechecked in depth. The analyst can do a sensitivity analysis to assess what the impact on the analytical conclusions would be if some information or assumption turned out to be incorrect or subject to a different interpretation. The matrix can be a permanent record of the hypotheses that were considered, the evidence used, and how that evidence was interpreted.

Given the way the cards were stacked on the Iraq WMD issue, it is highly unlikely that an ACH analysis would have given the Intelligence Community a different answer. One might hope, however, that it would have added some measure of uncertainty to the conclusion. There is obviously no guarantee that ACH or any other procedure will produce a correct answer. The result, after all, still depends on fallible human judgment applied to incomplete and ambiguous information. ACH does, however, guarantee an appropriate *process* of analysis. This process leads the analyst through a series of steps that avoid some common analytical pitfalls. It increases the odds of getting the analysis right. With practice, ACH can change how analysts think, because "the mind once stretched by a new idea, never resumes its original shape."ⁱⁱⁱ

ACH is an excellent framework for collaboration between analysts. The cross-fertilization of ideas helps analysts generate more and better ideas. The matrix can combine inputs from analysts with different specialties. When analysts disagree, the matrix can be used to highlight the precise area of disagreement. Subsequent discussion can then focus productively on the ultimate source of the differences. One can do a sensitivity analysis to see how alternative interpretations of the evidence or different assumptions affect the likelihood of the hypotheses. This often helps resolve, or at least narrow down, areas of disagreement.

The author developed ACH 20 years ago to help the Intelligence Community deal with a particularly intractable type of analytical problem. It is now being taught in training courses for intelligence and counterintelligence analysts throughout the Intelligence Community. However, filling in the ACH matrix is time-consuming. The actual use of ACH, like other "alternative analysis" tools, has been limited by the time pressures under which analysts have to work and the tendency of analysts to think they already know the right answer.

With this in mind, the author and Palo Alto Research Center (PARC), with funding from the Intelligence Community's Advanced Research and Development Agency, developed software to facilitate the analysis of competing hypotheses. Based on the analyst's evaluation of the consistency or inconsistency of each item of evidence with each hypothesis, the ACH software estimates a rough probability for each hypothesis. The software allows the analyst to sort and compare the evidence in various analytically-useful ways. It sorts by diagnosticity to identify the key information and assumptions that ought to be double checked. It also sorts by type of source so the analyst can look for indications that one or more types of sources might be manipulated. Evidence can be partitioned to compare the probabilities of the hypotheses based only on older evidence versus more recent evidence, or based on open sources versus clandestine sources, or based on the analyst's assumptions and logical deductions versus hard evidence.

The software was tested in courses in analytic techniques taught by Pherson Associates at the CIA, FBI, and the Joint Counterintelligence Training Academy (JCITA). Applying the software to multiple case studies in several analytic environments greatly facilitated efforts to optimize its utility to analysts. With the introduction of the software version, the use of the ACH methodology has increased dramatically across the Intelligence

Community. The author's intent is that this software will be available to the public at no cost so that graduate students preparing for careers in the Intelligence Community can learn this optimal mode of analysis during their graduate studies. It now can be accessed on the Internet at www2.parc.com/istl/projects/ach/ach.html or at www.pherson.org.

Future of Intelligence Analysis

Let us hope that the outpouring of finger pointing and self-criticism since the Iraq debacle leads to much more than the shifting of organizational boxes in the Intelligence Community. However useful such a reorganization may or may not be, it will not touch the fundamental question of how to do prescient analysis.

The Intelligence Community needs to develop a 21st Century analytical culture that differs from the conventional intuitive analysis of the past. New procedures and processes, informed by insights from cognitive and management sciences, need to be developed for testing our mindsets, facilitating interagency collaboration among analysts, communicating about uncertainty, and for selecting, training, and evaluating analysts. We should also be asking, what is the unique role of intelligence analysis in the information age. When news and commentary on current events is available to all with a few clicks of a computer mouse, should analysts be spending so much time writing reports and giving briefings about current events? Or should they be spending more time on longer term research that questions assumptions or develops analytical frameworks to guide the ongoing monitoring of events?

ⁱ Senate Select Committee Report, p. 6.

ⁱⁱ *The 9/11 Commission Report*, p. 344.

ⁱⁱⁱ Attributed to former U.S. Supreme Court justice Oliver Wendell Holmes.