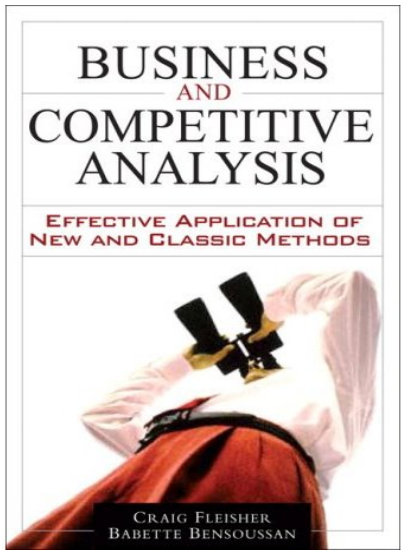

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Chapter 28

Analysis of Competing Hypothesis

Ch. 28 Analysis of Competing Hypothesis

- Short Description
- Background
- Strategic Rationale & Implications
- Strengths & Advantages
- Weaknesses & Limitations
- Process for Applying Technique
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Ch. 28 Analysis of Competing Hypothesis

Short Description

- Analysis of Competing Hypotheses (ACH) is a multi-variable, qualitative technique that aids judgment on important issues requiring careful weighing of alternative explanations or conclusions.
- ACH is grounded in basic insights from cognitive psychology, decision analysis, and the scientific method.

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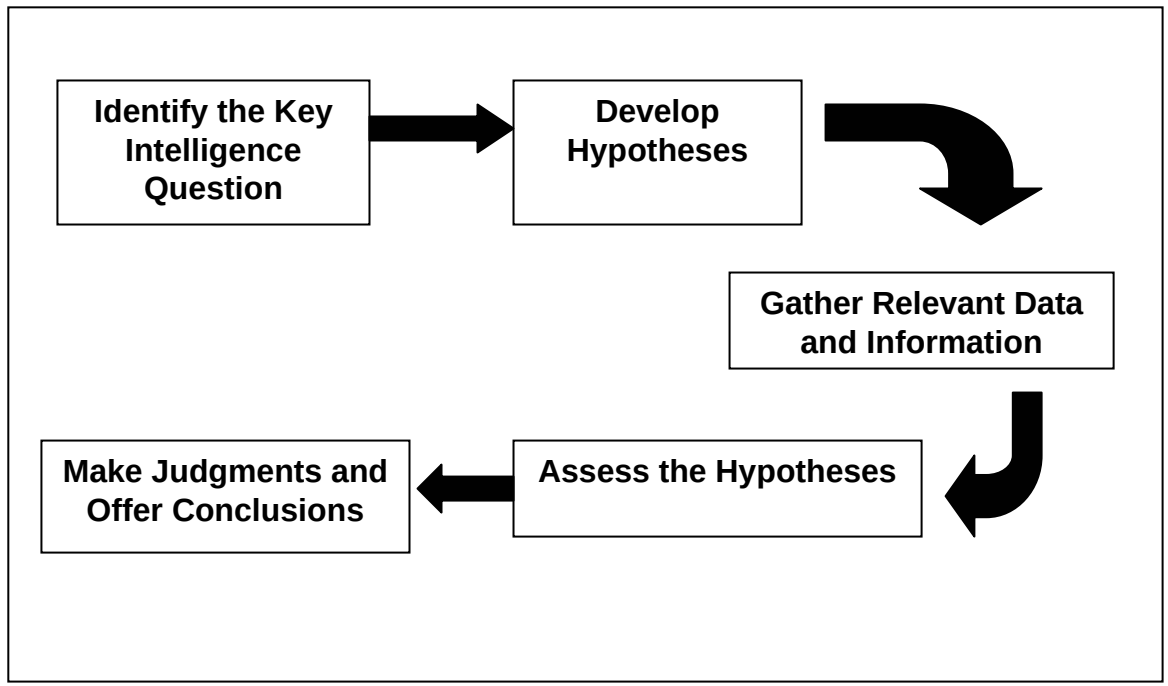
Background

- Richards Heuer's *The Psychology of Intelligence Analysis.*

Illustration of a Generic ACH Process



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Background

- From military intelligence beginnings.
- WMD Report 2005: lack of consideration of alternative hypotheses.
- Individuals all make assumptions.
- Sometimes these are communicated to decisions makers—sometimes not.
- Assumptions can greatly influence the quality of an analysis.
- It is critical that they are given proper recognition in the analysis process.

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Strategic Rationale and Implications

- ACH is a process for refuting hypotheses.
- Typical: analysts choose what they intuitively suspect is the most likely answer, then examine the gathered information looking for support.
- Satisficing strategy means choosing the first solution that seems satisfactory.
- Analysts can overlook that evidence may be supportive of alternative explanations.
- ACH technique allows for a procedural loosening of dominant thought processes

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Strengths and Advantages

- ACH keeps individuals from falling prey to common analytic pitfalls.
- Appropriate for controversial issues.
- Helpful tool to assist an analyst's judgment on issues that require a careful evaluation of alternative explanations.
- ACH provides a convenient and visual means for indicating the specific area in which there may be dissenting views.

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Strengths and Advantages

- Sawka (2003) suggests that ACH has the following three key strengths:
  1. ACH compels a systematic examination of all hypotheses;
  2. ACH illuminates the analyst's logic to their customers; and
  3. ACH ensures that the analyst properly considers the data and information they have gathered.

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Weaknesses and Limitations

- Analysts are reluctant to regularly employ ACH.
- Most people lack the capability to consider the volume of evidence that can go into developing and analyzing a set of competing hypotheses.
- Deception detection depends on areas where people are weak:
    - Reasoning about negative or absent evidence.
    - Reasoning about false evidence.
- ACH can actually increase the likelihood that the analyst will be deceived.

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Process for Applying the Technique

- The following 8-step process is adapted from the standard one recommended by Heuer (1999).
  - **1) Identify the possible hypotheses.**
    - Bring together a group of analysts with different backgrounds for brainstorming.
    - Wait for all the possibilities to be identified before considering them.
    - Try to keep the number of hypotheses manageable (7 is a good target).
    - Designate the hypotheses not to be analyzed as unproven hypotheses.

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Process for Applying the Technique

- **2) List the significant evidence in support of and against each hypothesis.**
  - List the significant evidence in support of and against each hypothesis**.**
  - Evidence doesn't need to be firm at this point to be included.
  - Note the absence as well as the presence of evidence.
  - Include assumptions about your competitors' intentions, goals or standard procedures.
  - Then consider each hypothesis individually, listing factors that tend to support or contradict each one.

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Process for Applying the Technique

- **3) Prepare a matrix with hypotheses across the top and evidence down the side.**
  - This step may be the most crucial one in this process.
  - It is also the step that differs most from the intuitive analysis approach typically used.
  - Sample matrix:

	Hypothesis 1	Hypothesis 2	Hypothesis 3	Hypothesis 4
Evidence 1	+	-	+	-
Evidence 2	+	+	+	+
Evidence 3	N/A	-	+	-
Evidence 4	-	-	+	-
Evidence 5	?	-	+	-
Evidence 6	+	?	+	?

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Process for Applying the Technique

- **3) Cont'd**
  - Consider how each item of evidence relates to the hypotheses.
  - Take one item of evidence at a time and consider how consistent it is with each hypothesis.
  - Evidence will be: (in relation to the hypotheses)
    - consistent with (+ or C for consistent)
    - inconsistent with (- or I for inconsistent)
    - irrelevant (? or NA for not applicable)
  - Evidence is diagnostic when it influences your judgment on the relative likelihood of the various hypotheses identified in Step 1.

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Process for Applying the Technique

- **4) Refine the matrix**
  - The way the hypotheses are worded is crucial to drawing conclusions from the analysis.
  - May be appropriate to reconsider and reword the various hypotheses.
  - Two hypotheses may be combined into one when there is no evidence that distinguishes them.
  - May delete evidence and arguments that are unimportant and/or have no diagnostic value.
  - Items should be saved in a separate list.

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Process for Applying the Technique

- **5) Draw tentative conclusions about the relative likelihood of each hypothesis by trying to disprove it.**
  - This step is the adjunct to Step 3.
  - Begin by looking for evidence that enables you to reject hypotheses.
  - Proceed by rejecting or eliminating hypotheses, while tentatively accepting only those that cannot be refuted.
  - Hypotheses with the most minuses should get the most consideration.
  - Steps 4 and 5 are where the process is susceptible to bias.

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Process for Applying the Technique

- **6) Analyze how sensitive your conclusion is to a few critical pieces of evidence.**
  - Analysts should ask the following kinds of questions at this point.
    - Are there questionable assumptions underlying your interpretation?
    - Are there alternative explanations?
    - Could the evidence gathered and used be incomplete and/or misleading?
  - It may be appropriate at this point to reassess original source materials as opposed to relying on others' interpretations.

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Process for Applying the Technique

- **7) Report conclusions.**
  - Decision makers should know the relative likelihood of all the alternative possibilities.
  - Analysts should offer contingency plans.
  - A hypothesis that is probably true could mean anywhere from a 55% to an 85% chance that future events will prove it correct.
  - The report produced for decision makers should provide a comparative evaluation of competing hypotheses.

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Process for Applying the Technique

- **8) Identify milestones for future observation that may indicate events are taking a different course than expected**
  - Any conclusion the analyst provides to the decision maker should always be regarded as tentative.
  - The situation may materially change.

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Process for Applying the Technique

- Heuer (1999) notes that three key elements distinguish ACH analyses from conventional intuitive analysis.
  - ACH begins with a full range of alternatives rather than with a most likely alternative which ensures that all alternative hypotheses receive balanced consideration.
  - ACH helps the analyst to distinguish the precious few evidentiary items that have the highest diagnostic value in assessing the relative likelihood of the alternative hypotheses.
  - ACH requires the analyst to identify evidence that refutes, as opposed to confirms, hypotheses. The most probable hypothesis is usually the one with the least evidence against it.

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- **FAROUT Summary**

	1	2	3	4	5
F					
A					
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Ch. 28 Analysis of Competing Hypothesis

Related Tools and Techniques

- Abduction
- Deduction
- Induction
- Scientific process

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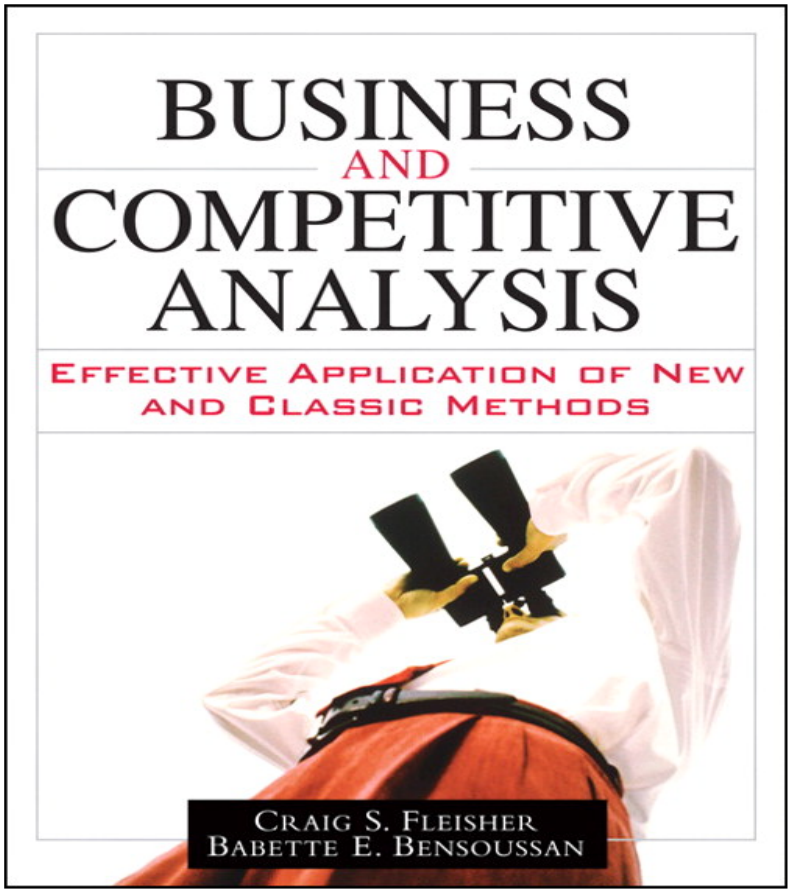

For More About ACH and 23 Other Useful Analysis Methods, see:

Fleisher, Craig S. and Babette E. Bensoussan

Business and Competitive Analysis: Effective Application of New and Classic Methods

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