A Critical Thinking Primer

An Unpublished Manuscript

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Introduction

Welcome to your course!

This manuscript provides the basics of critical thinking you may use in your personal and professional lives. The skills required to conduct critical thinking are the most in-depth of the many types of research and analysis you will experience in your personal lives and most professional careers. This manuscript focuses mainly on blending critical thinking techniques with social science research methods and procedures—skills you can then adapt and use in other types of personal and professional analyses.

This manuscript varies somewhat from mainstream social science research methods material by adopting a framework for research, analysis, and writing/presenting based largely in critical thinking and creative thinking techniques. You may have been introduced previously to critical thinking and critical reading material. This manuscript will review and build on this previous material as it provides a more in-depth coverage of the critical thinking techniques you should master for successful critical thinking.

Characteristics of a Well-Cultivated Critical Thinker (Paul & Elder, 2014)

The goal of this manuscript is to improve your critical thinking so that you are able to:

- Raise vital questions and problems, formulating them clearly and precisely;
- Gather and assess relevant information, using abstract ideas to interpret it effectively;
- Come to well-reasoned conclusions and solutions, testing them against relevant criteria and standards;
- Think open-mindedly within alternative systems of thought, recognizing and assessing, as need be, their assumptions, implications, and practical consequences; and
- Communicate effectively with others in figuring out solutions to complex problems.

Warning: Cognitive Dissonance Ahead. From this point on in your development of new thinking skills you will experience cognitive dissonance—meaning as you learn new definitions and procedures to guide your thinking it will conflict with what you have learned in your previous education and experience, resulting in a level of “mental anguish.” In the process of working out this mental anguish caused by the differences between what you now know and what you will learn in the remainder of this manuscript you will experience “learning.”
The Vocabulary of Research & Analysis

One of the first things you will encounter is the fact there is very little standardization in the techniques, methods, and best ways to think. This is especially true in research methods definitions and concepts across academic disciplines or professional fields. Every academic discipline seems to have its own spin on the definitions and concepts they use—often confusing each other by using different definitions and terms to mean the same things. Professional fields are often stuck in traditional methods of doing research and analysis and do not yet fully embrace much of the material in this manuscript. However, the nation-wide call to improve professional research and analysis demands the professional fields adapt the new methods covered in this manuscript. The purpose of this section is to present some of the most important vocabulary (definitions and concepts) you will use in analysis in both your personal lives and professional careers. Some of the information in this section will make more sense after you delve deeper into material in this manuscript. Therefore, it is recommended you review this section frequently during your course.

Induction & Deduction

One of the most often confusing definitional differences surrounds the concepts of induction and deduction. Table 1 provides a quick survey of the differences in these concepts in relation to their use in reasoning and research—two related but often confused concepts. In this manuscript we use the Table 1 research definitions of induction and deduction. Scientific research, including social science research, is based on the Table 1 deductive research definition.

Table 1. Induction & Deduction Defined

<table>
<thead>
<tr>
<th></th>
<th>Reasoning Definition</th>
<th>Research Definition</th>
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<tr>
<td><strong>Induction</strong></td>
<td>Reasoning that leads to findings/conclusions based in probability (likely, probable, etc.).</td>
<td>Starts with the information (data, facts, evidence) already collected or about to be collected and then works from the information to the findings/conclusions using facts and basic logic. Grounded Theory is created through the inductive research methods.</td>
</tr>
<tr>
<td><strong>Deduction</strong></td>
<td>Reasoning that leads to findings/conclusions considered not refutable (i.e., the truth).</td>
<td>Starts with the existing knowledge or theory on the issue, develops hypotheses/alternatives and a research design to test the hypotheses/alternatives, then carries out additional data collection and analysis to test the hypotheses/alternatives—leading to the findings/conclusions. This is the Scientific Method.</td>
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</table>
The Ultimate Goal of Scientific Research

The *Holy Grail* of most researchers is to find the “truth” about their research topic. In fact, the “truth” is a very slippery concept when dealing with social science research. The fact humans have “free will” means they do not always act in the same way in similar situations. Therefore, instead of speaking about the “truth,” professional researchers tend to discuss and assess their work in terms of its reliability and validity. You will see the terms reliability and validity used throughout this manuscript. The definitions for these important concepts used in this manuscript include:

**Reliability.** If your study is **reliable**, it means that someone else can use your exact research design (your theory, hypotheses/alternatives, sampling methods, data collection methods, analysis methods, etc.) and come up with the same results.

**Validity.** If your study is **valid**, it means that you actually studied and measured the concepts your research design said you would. Validity in social science research is commonly defined by a combination of three general sub-categories of validity:

- **Construct Validity.** Means that you have adequately conceptualized and operationalized your research variables, process step contents, and/or agency models.

- **Internal Validity.** Means that you have a properly specified causal, process, or agency model. It assumes you have included the most important factors (variables) in your model and have excluded factors of little or no importance.

- **External Validity.** Means you have used a proper research design (sampling, data collection, data analysis) such that you can infer your research results to a larger population.

**Levels of Analysis**

To achieve research reliability and validity, it also assumes that you have used the proper levels of analysis in your research. In addressing **levels of analysis**, the researcher must be clear as to whether they are studying individuals, groups, or groups-of-groups, as defined by the levels of analysis used in their academic discipline. You cannot generalize (infer) your research results to a level of analysis you did not actually study (i.e., theorize about and collect data on). When you draw your research conclusion from a level of analysis other than the one you studied—it is called the **ecological fallacy**. For example, if your research focuses on collecting and analyzing data on individuals, you cannot then generalize your results to how groups made up of these individuals will act.

**Reducing Research Biases**

To achieve reliability and validity you must reduce research biases, which means you must maintain strict compliance with social science research procedures and attempt to use "triangulated" or "multi-method" studies whenever possible. Triangulated or multi-method studies often use alternative theories, research designs, data collection methods and analysis...
techniques to create divergent research designs that can overcome competing views of how the
world works (aka ontologies). They may combine qualitative, comparative, and quantitative
studies; use of multiple methods of data collection; and use of multiple data analysis
techniques—all to reduce bias and improve the reliability and validity of their research findings.
The bottom line is that a triangulated study reduces the bias in a research project and thus
increases the study’s validity. Additional material on research biases will be presented in a later
section of this manuscript.

Use of Research

Another way research can be categorized is by its use:

Pure (basic) Research. Is driven by the interests or puzzles of the researcher and may or
may not have any policy or other effect on the world of social practice.

Applied Research. Is driven by policy considerations. The intent is to use the research
to change the world of social practice (i.e., for social engineering or policy-making). Applied
research is the focus of most research and analysis.

Types of Research Studies

There are generally three types of studies you will encounter in the social science research world.
Academic analysts will at times be called on to develop studies of all three types.

Descriptive Studies. Call for answering questions starting with or leading to findings of
who, what, where, and when something happened. Historians with their thick narratives of
historical events, and journalists who make news events come alive, are the masters of
descriptive studies. Descriptive studies are based mainly on the inductive approach to research
and rely heavily on intuitive (vice systematic) analyses. These types of studies are usually
conducted using historical research methods rather than more systematic social science methods.

Explanatory Studies. Call for answering questions starting with or leading to findings of
why or how some human behavior, decision, or condition occurred. Social scientists are the
masters of explanatory social research, which are based mainly on the deductive approach to
research (i.e., scientific method) employing a range of systematic qualitative, comparative, and
quantitative research methods.

Predictive Studies. Call for questions starting with or leading to findings of what will
happen concerning some human behavior, decision, or condition. Intelligence analysts are the
masters of predictive studies, which are also based mainly in the deductive approach to research
employing a range of qualitative, comparative, and quantitative research methods.

Independent and Dependent Variables

An important distinction you must understand early in your research instruction is the difference
between independent and dependent variables. This distinction is particularly relevant when you
are investigating cause-effect relationships as we do whenever we use structural causal models in
our research. *The independent variable is what man or nature manipulates* -- a treatment or program or cause. The *dependent variable is what is affected by the independent variable* -- the effects or outcomes. For example, if you are studying “the effects of an alternative crop-substitution program on the amount of illegal drugs a state produces, the alternative crop-substitution program is the independent variable and the amount of illegal drugs the state produces is the dependent variable.

**Comparing Different Purposes of Research**

Table 2 classifies research into four main purposes: Historical Research, Social Science Research, Policy Analysis and Evaluation Research. The majority of the research and analysis you will conduct in your professional careers will be for one of these four main purposes.

**Historical Research.** Is probably what you have been taught and used the most in your past high school and undergraduate education. Historical Research, also used in journalism and the arts & humanities, usually starts with the data already or about to be collected and relies primarily on the author or researcher to organize and present the facts and then determine intuitively and use logic to establish what the facts mean.

**Social Science Research.** Is grounded in the “scientific method” that some of you may have learned in your natural or hard science courses along the way. Social Science Research tends to be very systematic as the findings or results of this research are expected to meet strict reliability and validity tests. This research can be qualitative, comparative, or quantitative.

**Policy Analysis Research.** Focuses on developing workable policy solutions and recommendations based on a systematic analysis of alternatives for the policy issue. Policy Analysis draws heavily on social science research methods. In developing good Policy Analysis, it usually includes a thorough study of the legal issues involved in the policy issue.

**Evaluation Research.** Focuses on the evaluation of policies, personnel, procedures, programs, projects, organizations, or other items to determine their success and then recommend changes for improvement. As with Policy Analysis, the researcher must be proficient in the skills of Social Science Research to conduct good Evaluation Research.
<table>
<thead>
<tr>
<th>General Research Tasks</th>
<th>Historical Research (Inductive Approach)</th>
<th>Social Science Research (Deductive Approach)</th>
<th>Policy Analysis</th>
<th>Evaluation Research</th>
</tr>
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<tbody>
<tr>
<td>When to Use</td>
<td>For Descriptive Research (provides who, what, where, and/or when material about a topic) Also sometimes used (incorrectly) for: Explanatory Research and Predictive Research—see Social Science Research.</td>
<td>For Explanatory Research (answers “what does this mean,” questions, e.g. why or how something happened); For Predictive Research (answers what will happen questions, includes forecasts and estimates)</td>
<td>Analysis directed at identifying a problem, developing alternative solutions and making recommendations. (Note: Results are influenced by resource availability and politics.)</td>
<td>For research directed at evaluating performance of: personnel, projects, policies, programs, or organizations; products or services; processes or systems; or other evaluation work (e.g., reviewing proposals, contract bids, job applications, etc.)</td>
</tr>
<tr>
<td>Identifying the Research “Puzzle”</td>
<td>General topic, General Questions, or Thesis Statement</td>
<td>1. Research Questions (general and specific)</td>
<td>1. Problem Statement (e.g., What should agency X do about problem Y?)</td>
<td>1. Problem Statement or Questions (well defined and with specific focus)</td>
</tr>
<tr>
<td>Determining What We Already Know About the Topic</td>
<td>Historiographies completed on major projects (e.g., books, dissertations, theses, major reports) to identify existing knowledge and gaps.</td>
<td>2. In-depth literature search &amp; review (includes survey of available theories &amp; models, ends in gap analysis)</td>
<td>2. Assemble Evidence (combination literature search and initial data collection) (Implied Literature Search, includes benchmarking from past evaluations)</td>
<td></td>
</tr>
<tr>
<td>Determining How Things Work (or Should Work)</td>
<td>Usually developed from the Data Analysis phase—often consists of grounded theory (theory developed from empirical data)</td>
<td>3. Use existing literature and/or researcher’s logic and reasoning to generate structural (causal) or process model(s)</td>
<td>3. Construct Range of Alternatives (includes constructing a causal model for system where problem is located)</td>
<td>2. Identify Evaluative Criteria (includes use of logic models)</td>
</tr>
<tr>
<td>Designing the Research Project</td>
<td>Activities to collect data are usually planned in advance for major projects.</td>
<td>4. Develop Research Design (to assess model and/or test hypotheses—e.g., type study, operationalization of variables, sampling plan, data collection plan, data analysis methods, assessment of bias/limitations)</td>
<td>4. Select Criteria (for evaluating alternatives)</td>
<td>3. Organize Criteria, Choose Sources 4. Deal with Causation Issues</td>
</tr>
<tr>
<td>Collecting Data</td>
<td>1. Project usually starts with empirical data already collected or about to be collected.</td>
<td>5. Collect Data (using data collection methods called for in research design) (Implied data collection)</td>
<td>(Implied data collection)</td>
<td></td>
</tr>
<tr>
<td>Analyzing Data</td>
<td>2. Conduct Analysis (uses evidentiary reasoning, the basics of critical thinking, historical method, case study method, and reasoning by analogy—i.e., the analysis relies largely on the intuitive logic and reasoning of the researcher)</td>
<td>6. Conduct Analysis (systematic qualitative, comparative, and/or quantitative analysis methods as called for in research design)</td>
<td>Use qualitative or quantitative methods to: 5. Project Outcomes (of each alternative) 6. Confront Trade-offs (including resources and politics) 7. Decide (on recommendations)</td>
<td>5. Assess Values in Evaluation 6. Determine Importance Weighting 7. Assess Merit Determination 8 Consider Synthesis Methodology 9. Consider Meta-Evaluation</td>
</tr>
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</table>
Selecting a Research Approach.

Once you determine the purpose of the research you will pursue (historical, social science, policy analysis or evaluation), you will also need to consider the research design approach you will follow. This section summarizes the qualitative, comparative, and quantitative research designs you may consider—each of these has their own strengths and weaknesses. Tables 3 and Figure 1 summarize considerations in selecting a research design.

Table 3. The Goals and Strategies of Research Design

<table>
<thead>
<tr>
<th>Research Goal</th>
<th>Qualitative Research</th>
<th>Comparative Research</th>
<th>Quantitative Research</th>
</tr>
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<tbody>
<tr>
<td>Identify Broad Patterns</td>
<td>S</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>Test/Refine Theory</td>
<td>S</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>Advance Theory</td>
<td>P</td>
<td>P</td>
<td>S</td>
</tr>
<tr>
<td>Make Predictions</td>
<td>S</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>Interpret Significance</td>
<td>P</td>
<td>S</td>
<td>P</td>
</tr>
<tr>
<td>Explore Diversity</td>
<td>S</td>
<td>P</td>
<td>S</td>
</tr>
<tr>
<td>Give Voice</td>
<td>P</td>
<td>P</td>
<td>S</td>
</tr>
</tbody>
</table>

P = Primary Use, S = Secondary Use
Source: Ragin (1994).
As Table 3 and Figure 1 above demonstrate, there are three primary research design approaches: *qualitative*, *comparative*, and *quantitative*. Each of these approaches has its own general procedures for empirical data collection and analysis.

**Qualitative:** You use qualitative methods when you are studying many aspects (both independent and dependent variables) of only a few cases (1-10 as a rule-of-thumb). Qualitative research looks for commonalities among the few cases. Qualitative data collection methods (covered in a later section of this manuscript) generally include content analyses, unobtrusive measure collection, participant-observations, interviews, and focus groups. Qualitative analysis usually includes an effort to code concepts found in the often-lengthy qualitative data collection and then to use the coded data to support, or not support, the study’s hypotheses. Descriptive statistics are also used frequently in qualitative analysis. The objective of qualitative explanatory analysis is to use methods of “descriptive inference” to test the study’s hypotheses.

**Comparative:** You use comparative methods when you are studying a moderate number of aspects (15-20 independent variables or so) of a moderate number of cases (10-50 or so). Comparative research looks for diversity in cases. Comparative data collection includes any of the methods used in either qualitative or quantitative studies. Comparative analysis also includes a combination of qualitative and quantitative methods—although they don’t always work well. Comparative analysis also utilizes its own methods such as Truth Tables and Fuzzy Set Theory.
. (Note: When discussing comparative research you must be careful of the definitions used. To research methodologists, comparative research means the use of comparative data collection and analysis methods. To Political Scientists (in the U.S.), comparative research means studying any political system outside the United States.)

**Quantitative:** You use quantitative methods when you are studying a few aspects (1-15 independent variables or so) of many cases (50 or more usually). Quantitative research uses mathematical theory to uncover precise relationships between variables. Quantitative data collection generally includes surveys or other methods used to gather data on many (50+) cases. Both descriptive and inferential statistics are used in the analysis of quantitative data. Inferential statistics techniques are specifically designed to test hypotheses.

Table 3 above demonstrates that your choice of research design approach (qualitative, comparative, or quantitative) is also governed by the goals for your study. For example, qualitative studies are best for interpreting significance, giving voice, and advancing new theories. Comparative studies are best for exploring diversity and advancing new theories. Quantitative studies are best for identifying broad patterns (i.e., inferring from a sample to a larger population), testing and refining theories, and making predictions. In identifying the goals of their research, social scientists sometimes confuse their terms. For example:

You cannot really “test” a theory using qualitative or comparative methods. Testing a theory is the province of quantitative studies. What qualitative and comparative researchers are doing is “advancing” their theories when they find evidence that supports their hypotheses.

However, all three types of methods can be used to “test” hypotheses. But, be careful! Even though you find convincing evidence supporting your hypotheses, they can never be “proven” or “disproven.” No matter how strong your correlations (co-variations) you can only “support/accept” or “not support/reject” a hypothesis.

**A Critical Thinking Framework**

This manuscript adopts the critical thinking framework published by the *Foundation for Critical Thinking* (see Paul and Elder, 2014). There are a number of differing critical thinking frameworks whose procedures are adapted for the research and analysis in specific academic disciplines or professional fields. The *Foundation for Critical Thinking* material is more general in nature and provides a framework that can be used in both your personal and professional lives for planning, problem-solving, and decision-making. The basic structure of the *Foundation for Critical Thinking* framework is depicted in Figure 2.
Nosich (2012), also with the *Foundation for Critical Thinking*, has added two additional elements to Figure 2—**Context** and **Alternatives**. When conducting most research and analysis, including **Context** and **Alternatives** in Figure 2 is critical to good results. **Context** and **Alternatives** must be considered in the use of all the additional elements in Figure 2.

Elder and Paul (2014) offer there is no specific order for addressing each of the Figure 2 elements. Figure 2 may be used for a variety of different research purposes (historical, social science, policy analysis, evaluation research, etc.) due to its general structure. However, each element should be considered in all analyses, but in some analyses a concentration on just a few of the elements may be appropriate.

This manuscript provides a more in-depth coverage of each of the Figure 2 Elements of Thought. Figure 3 is a synthesis of the recommended progress through the elements in a Social Science Research project. While Figure 3 presents a more linear organization of the elements’ use, remember that all the elements must be considered and reconsidered during the research and analysis project. Appendix 1 has additional material on the Elements of Thought.
Humans tend to not be good critical thinkers. We tend to rely on a number of poor thinking techniques that include cognitive biases (discussed in this section) and logic fallacies (covered in detail in Appendix 2 of this manuscript). Additionally, we tend to rely too much on our feelings, emotions, etc., to drive our thinking instead of using more systematic methods of analysis. Critical thinking provides a variety of techniques for us to overcome these poor thinking tendencies.

There are two important reasons for why critical thinking is important to you. First, employers seek new employees with critical thinking skills. Second, since birth you have been “programmed” with a number of poor thinking “habits” resulting in a number of cognitive biases leading to degraded thinking. The need for you to master critical thinking skills is thus driven by the demands of your future employers and the need to overcome the many cognitive biases all of us tend to use.
Employers Want Critical Thinkers

The National Association of Colleges and Employers have determined that the top skills employers look for in their new hires include:

1. Critical Thinking & Problem Solving
2. Oral and Written Communications
3. Teamwork and Collaboration
4. Application of Information Technology
5. Leadership
6. Professional and Work Ethics

Source: NACE, 2016

The importance employers and academia place on critical thinking has increased significantly over the past 2-3 decades during the emergence of the Information Age (replacing the Industrial Age) where critical and creative thinking is needed to advance our society. Additionally, over the last two decades since the U.S. terrorist attacks on September 11, 2001, improving critical and creative thinking in intelligence and policy analysis has become a major focus of federal, state, and local agencies.

We All Have Cognitive Biases

Kahneman (2011), a Nobel Prize winner, identified 48 cognitive biases that regularly affect human thinking. His work argues that in every human problem-solving, decision-making, or other analytic situation, one or more of these cognitive biases is at work to degrade the quality of the thinking effort.

To better understand the concept of cognitive biases, psychologists use an abstract model of human thinking that they label as System 1 (Fast) and System 2 (Slow) thinking. Figure 4 provides a graphical representation of System 1 and System 2 thinking. Also included with Figure 4 is a summary of the characteristics, advantages and disadvantages of System 1 and System 2 thinking.
Everyone uses a mix of System 1 (Fast—the rabbit) and System 2 (Slow—the turtle) thinking. However, to be a good problem-solver, decision-maker, or analyst, you must learn to more frequently engage the systematic System (2) to improve the overall results of your thinking.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>System 1</th>
<th>System 2</th>
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<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td>Speed of response in a crisis</td>
<td>Allows reflection and consideration of the “bigger picture”, options, pros and cons, consequences</td>
</tr>
<tr>
<td></td>
<td>Easy completion of routine or repetitive tasks</td>
<td>Can handle logic, maths, statistics</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td>Jumps to conclusions</td>
<td>Slow, so requires time</td>
</tr>
<tr>
<td></td>
<td>Unhelpful emotional responses</td>
<td>Requires effort and energy, which can lead to decision fatigue</td>
</tr>
<tr>
<td></td>
<td>Can make errors that are not detected and corrected, such as wrong assumptions, poor judgements, false causal links</td>
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</table>

- System 1: Fast, Effortless, Unconscious, Triggers emotions, Looks for causation
- System 2: Slow, Effortful, Conscious, Logical, Deliberative, Can handle abstract concepts
The goal of critical thinking is to improve your capabilities to use System 2 (Slow) thinking. Most people employ mainly System 1 (Fast) thinking as it is how their thinking has developed since birth, plus it is easier to use System 1 (Fast) thinking as it requires much less mental effort than System 2 (Slow) thinking. System 1 (Fast) thinking still has its place, but to be a good problem-solver, decision-maker or analyst, you must also master the systematic techniques characteristic of System 2 (Slow) thinking.

Of Kahneman’s (2011) 48 identified cognitive biases, there are seven that are prevalent in most people’s thinking and thus degrade the thinking results. If you can overcome these seven cognitive biases, you are on your way to becoming a successful critical thinker. Here are the seven:

1. **Confirmation Bias** – when the analyst looks only at evidence that supports their pre-formed point of view. They simultaneously discount or reject any information that is counter to their point of view. This bias is rampant across society as a whole.

2. **Anchoring Bias** – the analyst’s tendency to focus on one trait or piece of information in developing their findings. Anchoring usually leads to a failure to consider other alternatives in the situation. A common tendency is for the analyst to focus on only one or two causes for a resulting action, when in fact the situation is more complex with multiple causes at play.

3. **Perception Bias** – when the analyst assumes the actors whose behavior is being explained or predicted will think or act just as the analyst would. This is also called **Mirror Imaging**. Cultural reasons are often the cause of actors thinking or acting differently than the analyst assumes.

4. **Group Conformity Bias** – when the analyst agrees with the recommendations or points of view of the group, even though the analyst’s information or analysis has developed a different alternative or outcome. This is often called **Group Think**. This usually leads to the group not analyzing the full range of alternatives in a situation.

5. **Fundamental Attribution Error Bias** – when the analyst over-emphasizes the personality based explanations or predictions in a situation. In academic circles we call this putting too much emphasis on the **Agency** factors (person’s internal traits such as personality, decision-making tendencies, risk aversion, etc.) over the **Structural** factors (outside pressures, organizational or institutional constraints, laws and regulations, etc.), which affect the situation.

6. **Representativeness Bias** – often called **Stereotyping**, this is when the analyst tends to explain or predict the actor’s decisions or behaviors based on the actor’s ideology or other traits (e.g. religion, political views, ethnic group, language, country of origin, etc.).
7. **Blindspot Bias**—when analysts are unaware of their own biases, even when they can recognize biases in others. Analysts will rate themselves as less biased than other analysts 90% of the time, but they are usually wrong.

**Evaluating Bias in Research**

Researchers strive to use critical thinking techniques (covered in this manuscript) to improve their thinking, while also attempting to achieve both reliability and validity in their research, but in fact there is no such thing as bias free research. All researchers have differing perceptions, emotions, values, etc., which influence the way they see and interpret the world. A first step in reducing these biases is recognizing they exist (i.e., overcoming the above Blindspot Bias).

The researcher’s view of how the world works (*ontology*) is a major source of research bias. Realists, idealists (liberals), Marxists, post-modernists, constructivists, structuralists, etc., (explained in a later section of this manuscript) all approach their research with different views of how the world works—meaning they have different assumptions and generate different models and theoretical propositions on how the world works. Describing these many different ontologies is the responsibility of the courses in an academic program. In this section, we are going to proceed with an explanation of “positivist” ontology and its effects on bias. Positivists offer that the social world (human behavior, decision-making, conditions, etc.) can be studied using the scientific method. Positivists tend to focus on achieving good science by combining logic and reason with empirical observations (data, facts, evidence, information, etc.).

Positivists look at the world in more than one way. One method used to explain these differences in how positivist researchers view the world of social practice is to use the approaches of “etic” and “emic” as depicted in Figure 5.

**Figure 5. Differing Positivist Approaches to Research**

![Diagram of etic and emic approaches](image)

Figure 5 depicts the difference between the **etic** and **emic** approaches to positivist social science. In the **etic** approach, the researcher remains outside the world of social practice and observes it.
(and tries to explain it) from afar through their own particular “biased lens” on the world. Most positivists ascribe to this etic approach. What you have to remember; however, is that each individual researcher has their own particular lens through which they view the world. These lenses are based upon a number of factors (academic discipline, theoretical approach, specific ontology, real world experiences, personal prejudices, cognitive biases, etc.). The point here is that no matter how much the researcher tries to reduce this biased lens—it won’t go completely away. Thus, all research will have some personal biases included. This effectively means there is no such thing as value-free or unbiased social research using the etic approach. The emic approach, on the other hand, also a positivist one, sees the researcher enter the world of social practice, where they try to both explain and understand the world of social practice from the point of view of the inhabitants. This is what anthropologists do when they live with a group of people (indigenous tribes, etc.) for long periods of time. However, those who ascribe to the emic approach must also realize that they too have a “biased lens” through which they see the world of social practice. The etic and emic approaches highlight some of the differences and disagreements over just how we best gain knowledge of the world of social practice.

**Evaluating Bias—The Specifics**

Proper interpretation of research results (findings) should anticipate criticism by explicitly recognizing the biases that may occur from the research design and analytic approach. It is far better to point out the weaknesses in your own findings than have someone else criticize your work.

If the biases are fatal, then you’d be advised to take on a different project. But that is not usually the case. In most instances, biases exist, but the findings are nonetheless valuable, if interpreted with the appropriate caveats in mind. Your task in any research project is to sensitize the reader to those caveats. When planning your own research or evaluating others’ research in your literature review, you can use the following guidance.

**How to Discuss Bias**

In order to systematically discuss the problems of bias that your research project may confront, it is helpful to consider 3 elements:

1. **Nature of the bias.** What is the source of the bias? For example, many researchers use income as an operational definition of quality of life. But income from a person's occupation may not the only source of monetary resources. There is also income from stocks and bonds, from investments, from rental property, and so on. Hence, we can say that income is a biased measure of quality of life. (Or, alternatively, that wages are not a true picture of wealth.)

2. **Direction of the bias.** What is the likely effect of the bias? The direction of the bias associated with the income variable is to **underestimate** quality of life.

3. **Magnitude of the bias.** How large is the effect of the bias? This is the most difficult question to answer. Indeed, if we knew how large the bias actually was,
then we could correct the estimates accordingly and be rid of the problem. In most cases, about all you can do is plausibly speculate. In the income case, for example, it is plausible to argue that the magnitude of the bias is small. Why? Because in most populations very few people who are in the labor force have other sources of income. Hence, one could argue, the bias is likely to be small, and we can proceed ahead with the analysis.

Elements: Purpose & Questions

All research projects must start with a larger purpose and one or more specific research questions to be answered. In some situations, the tasking for the research effort will provide the purpose and research question(s). In other cases, the analyst must revise the research tasking or develop their own purpose and research question(s). This section focuses on writing Social Science Research Questions, which usually consist of a larger research puzzle, a general research question (purpose), and then the specific research question(s), which is what the researcher actually studies.

The main purpose of writing one or more specific research questions is to narrow the focus of your project such that you can adequately answer the question in one research project considering the time and resources available. For new researchers, usually only one specific research question should be developed.

The Research Puzzle

Before writing a good specific research question, you must first have a research puzzle. The research puzzle defines the Purpose or the “bigger picture” issue concerning a topic that other people care about. The reason we do not study the actual research puzzle is that it is usually too broad in scope to be studied with the time and resources available. In other words, your research puzzle should be a “larger example” of a problem that people care about because of their consequences. For example, the research puzzle could encompass:

1. Causes of war or conflict.
2. Chances for nuclear conflicts.
4. Results of US government reorganizations.

The above are “bigger picture” issues that it could take years to study adequately and several book-length manuscripts to report the study findings—therefore it is impossible to address such problems in a single research project. In developing general and specific research questions (see below) we work toward carving off just a small piece of the larger research puzzle to address.
Writing the General Research Question (Purpose)

Once you have your research puzzle, the next step is to develop a general research question that answers the question of: **Why should anyone care about your research?** You must connect, in other words, what you are doing to something that other people care about. You must explain what the problem you are addressing is an instance of.

The specific research question (see below) you choose to address should be an “example” of a larger problem that people care about. They may care about it because of its consequences. Another reason people (social scientists, in particular) might care about your research is that it solves a theoretical puzzle. Adding to the theoretical base on your general research topic is a contribution most social scientists seek.

Finally, you must ask whether there is an obvious answer to the general research question. Suppose you ask: Are powerful states really more likely to win wars than weak states? The obvious answer is “Yes they are.” This general research question would then be interesting only if you plan to show how, at least in some circumstances, weak states can prevail over powerful states.

Good general research question examples include (these correspond to the above research puzzle examples):

1. Why would an external non-state actor (terrorist group, etc.) incite a war with a regional power?
2. Will contiguous regional powers with nuclear weapons use them in a local conflict?
3. Why do organizational cultures affect interagency intelligence sharing and analysis?
4. Will government reorganization improve interagency intelligence sharing?

Writing the Specific Research Question

Writing the actual specific research question first calls for an understanding of the general research topic you want to address. This final step is to determine what small piece of this larger research topic you want to address in the study at hand. As part of this step, you must also determine what type of study you want to conduct—descriptive, explanatory, or predictive. With these issues in mind, the writing of the actual specific research question encompasses the following general procedures:

1. Start with the interrogatory wording (why, how, will, etc.) for the type of study desired.
2. Include the exact human behavior, decision, or condition you want to describe, explain, or predict. This is the dependent variable for your study.
3. Include the exact case or cases you will investigate in your study.
4. Only include independent variables (potential causes) in the research question if they are a main interest of the study. In most studies, the independent variables will emerge from the literature search/review and theoretical framework development and will not be known at the research question-writing stage.

5. Do not include a lot of descriptive or contextual material as subordinate clauses or modifying words in the specific research question. KISS (Keep It Simple Sailor) is good advice when writing research questions.

Good specific research question examples include (these correspond to the above general research question examples):

1. Why did Israel and Hezbollah go to war in Lebanon in 2006? (This question calls for an explanatory study. The dependent variable is the start of the war. The case study is the 2006 Israel-Hezbollah war.)

2. Will Pakistan and India fight a nuclear war in the next decade? (This question calls for a predictive study. The dependent variable is the potential start of a nuclear war. The case study is Pakistan versus India.)

3. How did differing organizational cultures prevent US intelligence agencies from predicting the 9/11 attacks on the World Trade Center and Pentagon? (This question calls for an explanatory study. The dependent variable is the intelligence agencies’ prediction of the 9/11 attacks. The independent variable of main interest (the cause) is differing organizational cultures. The case study is the 9/11 attacks on the World Trade Center and Pentagon.)

4. Will formation of the Department of Homeland Security improve US intelligence sharing on terrorism? (This question calls for a predictive study. The dependent variable is the improvement of US intelligence sharing on terrorism. The independent variable of main interest is the formation of the Department of Homeland Security. The case studies involve agencies in the US intelligence community.)

A Final Check

Once you have drafted your specific research question, you should give it a reality check by asking the following questions:

1. Are there obvious answers to your specific research question? If so, what is wrong with the obvious explanations or predictions?

2. Why is/are the case study or studies (or set of cases, or texts, or other body of data) you have chosen good choice(s)?

3. Are there other obvious cases (or other data) to look at?
4. Does (do) your case(s) (or other data) raise any special puzzles or create any special challenges?

5. Is the information and data that you will need to answer your specific research question already available or collectable within the time and resources available for this project?

**Element: Information (What We Already Know)**

In-depth information is critical to all types of thinking. Displaying “Anchoring Bias,” where you base your thinking on one or two facts will result in a poor set of findings. It is critical to thoroughly search for information on the topic you are addressing.

**Information Literacy**

Information literacy is the ability to recognize the extent and nature of an information need, then to locate, evaluate, and effectively use the needed information. Once the research project’s general and specific research questions are developed, the next step is to employ information literacy skills to determine the availability and quality of existing information on your specific research question. Information literacy is often cited as the most important skill for a person to become a “life-long learner.”

**Locating Information**

Most libraries provide reference librarians to assist with your literature searching. Once you have a general and specific research question, this is the first person you should contact. Not all information on a topic is available on the Internet. In fact, the Internet is the last place you should search for information on your specific research question. Not everything we know on particular topics has been digitized. There is still information you will need to find in paper books, journals, newspapers, etc., paper archives, online data bases and then last look on the Internet. A good strategy for searching sources is to look in priority order using keyword searches in the following sources:

- Articles (online databases and paper journals)—provides latest information
- Government Reports, Think Tank Reports
- Lexis/Nexis, Westlaw (news, business, law database)
- Book (paper and online)
- Newspapers/Magazines and Media (national & local—online and paper)
- Web Links/Internet—last sources to consult

The initial quality of what you find is also important. You should first search for scholarly or professional works as they tend to possess more reliability and validity than other works. Table 4 provides a summary of the characteristics of scholarly/professional and popular sources you will find in your literature searching.
Table 4. Scholarly/Professional versus Popular Literature

<table>
<thead>
<tr>
<th></th>
<th>Scholarly/Professional Sources</th>
<th>Popular Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Audience</strong></td>
<td>Scholars, researchers, practitioners</td>
<td>General public</td>
</tr>
<tr>
<td><strong>Authors</strong></td>
<td>Experts in the field (i.e., faculty members, researchers, professionals)</td>
<td>Journalists or freelance writers</td>
</tr>
<tr>
<td></td>
<td>Articles are signed, often including author's credentials and affiliation</td>
<td>Articles may or may not be signed</td>
</tr>
<tr>
<td><strong>Footnotes</strong></td>
<td>Includes a bibliography, references, notes and/or works cited section</td>
<td>Rarely includes footnotes</td>
</tr>
<tr>
<td><strong>Editors</strong></td>
<td>Editorial board, often of outside scholars (known as peer review)</td>
<td>Editor works for publisher</td>
</tr>
<tr>
<td><strong>Publishers</strong></td>
<td>Often a scholarly or professional organization or academic press</td>
<td>Commercial, for profit</td>
</tr>
<tr>
<td><strong>Writing Style</strong></td>
<td>Assumes a level of knowledge in the field</td>
<td>Easy to read – aimed at the layperson</td>
</tr>
<tr>
<td></td>
<td>Usually contains specialized language (jargon)</td>
<td>Articles are usually short, and often entertain as they inform</td>
</tr>
<tr>
<td></td>
<td>Articles are often lengthy</td>
<td></td>
</tr>
<tr>
<td><strong>General Characteristics</strong></td>
<td>Primarily print with few pictures</td>
<td>Contains ads and photographs</td>
</tr>
<tr>
<td></td>
<td>Tables, graphs, and diagrams are often included</td>
<td>Glossy</td>
</tr>
<tr>
<td></td>
<td>Usually few or no ads – if there are ads, they are for books, journals, conferences, or services in the field</td>
<td>Often sold at newsstands or bookstores</td>
</tr>
<tr>
<td></td>
<td>Often have &quot;journal,&quot; &quot;review,&quot; or &quot;quarterly&quot; as part of the title</td>
<td>Usually restarts pagination with each issue</td>
</tr>
<tr>
<td></td>
<td>Successive issues in a volume often have continuous pagination</td>
<td>Usually have quite a broad subject focus</td>
</tr>
<tr>
<td></td>
<td>Usually have a narrow subject focus</td>
<td></td>
</tr>
</tbody>
</table>

The following provides a rough guide of the numbers of sources (documents) you can expect to cite and read in your literature search. A good rule of thumb is to have 1 ½ to 2 citations for each textual page in undergraduate studies and 3-4 citations in graduate studies. When works cited and read fall outside the below ranges you may be into overkill (too many or wrong sources) or may be missing large chunks of relevant literature.
<table>
<thead>
<tr>
<th>Research Project</th>
<th>Expect to cite this many</th>
<th>Expect to read this many</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctoral dissertation</td>
<td>200 to 300</td>
<td>500-800</td>
</tr>
<tr>
<td>Master’s thesis</td>
<td>50 to 100</td>
<td>100-200</td>
</tr>
<tr>
<td>Journal article</td>
<td>12 to 25</td>
<td>25-50</td>
</tr>
<tr>
<td>Course paper</td>
<td>15-20</td>
<td>25-40</td>
</tr>
<tr>
<td>Technical note</td>
<td>10 or fewer</td>
<td>20 or fewer</td>
</tr>
</tbody>
</table>

**Hints on Conducting Literature Searches**

This sub-section was modified from an original web article by Dr. Robert Brown, B.Agr.Sc (hons), Ph.D., M.B.A., 10 Kardinia Street, Sunnybank, Brisbane, Australia 4109, (Telephone 07 345 4192).

This is a thumb-nail sketch of some helpful principles in conducting a literature search. Most of it is common sense (but common sense is often anything but common) and comes down to four main points (herein labeled the Golden Rules). First, do it one project at a time. Second, keep copies of every document. Third, read what you collect. Fourth, interact with the literature with a pen and highlighter.

Note: As you proceed through this manuscript you will learn additional skills for assessing the quality of individual sources you find in your literature search. The following provides some general guidance for searching the literature that you can later combine with the more in-depth material on assessing sources found.

**One Brick at a Time (#1 Golden Rule)**

Literature searches can seem overwhelming, especially for major research projects such as theses or dissertations. However, as Chairman Mao said, “the longest journey starts with a single step,” so that #1 Golden Rule is always to remember that a search is built one document at a time.

A literature search is a journey: your journey through scholarship and information available on your particular project. Some of us are seasoned travelers, some of us are not, but even the most seasoned travelers take each journey only once and, each time, there is something different to be learned from the journey. Moreover, each journey brings forth different things, but never everything. This means that your search needs to be competent and comprehensive, but not encyclopedic. Do not feel that you have to be able to write as if you were the great learned guru, because that feeling usually gets in the way.

Basic advice about conducting a literature search is to set out what is known in a particular part of a discipline, but that tells only part of the task. The key is to focus on reviewing the literature found with an eye on answering the following questions:

(a) What is known about the topic (specific research question)?
(b) Why is this topic important?
(c) What is unknown (what are the gaps in the literature)?
(d) Why are some things unknown?
(e) Why should the gaps be filled?
(f) Which gaps do you propose to fill and why have you chosen them?
(g) How do you propose to fill them?

This is hardly an exhaustive list of the questions that you might pose in a literature search. However, it is important that they be asked and answered explicitly, because they are so often overlooked. When we do this, we also tend to expect that the facts will speak for themselves (in this case, the facts are the literature cited), but, of course, they rarely do.

**Remember That Literature Is Data**

Ever since Pythagoras proposed that everything in the universe could be described in terms of natural numbers, we have had a fascination with numbers that has sometimes caused us to overlook the fact that the numbers are the map, not the territory.

In research, there are two types of data: the stuff we generate ourselves and the stuff that others generate, although we often think of them as being more different than they really are. With our own data, we see the raw numbers. With other people's data, we rarely see anything but processed numbers. Sometimes, it is processed as a set of averages or a correlation, so it is still easily recognizable as data. Sometimes, it is processed into an idea, an insight, or a question. Sometimes, the data is something that cannot even be quantified. For example, "the animals were highly stressed because of the prolonged drought" might be vital data but both the stress and the drought defy strict quantification.

The point of this paragraph is to remind you that everything is data. The form may vary a little but the substance remains the same. Literature searches are easier to conduct if you remember this.

**Always Keep Copies of Every Document (#2 Golden Rule)**

Keep copies (a) so that you know exactly what an author argued, and (b) so that you can re-read the document later when you have a better grasp of the topic and will find even more than you did on the first reading. Time spent chasing down a copy that you should have made in the first instance is time wasted.

**Always Get the Full Citation Details**

Whenever you make a download or copy documents, or write down information from a source you do not copy or download, make sure that you get the full citation so you can later reference the source in written reports.

Most journals have the journal citation as part of the running heading on alternate pages, but a few have it on only the first page. Either way, make sure it does not get cut off by the
photocopier. Articles are useless without citations and remember that not everything can be found easily if you try to get the citation later on. (For journals, always make sure that you have the full name for each author, year, title of article, full name of journal, volume number, part number, and page numbers. You will not always use all this information, but life is a lot easier with it than without it.)

With books, always photocopy/download the title page (and the following page if information about publisher, edition, location, and so on is not all on the title page) and write on it the total number of pages in the book (you may or may not wish to cite the whole book, but it is a lot more efficient to record this information at the outset, especially with inter-library loans, so do it as a matter or routine). If you copy/download only parts of chapters, make sure you have the chapter title, author (some books have separate authors for separate chapters) and page numbers of the whole chapter.

Apart from photocopying/download the chapters you want to cite, it is also a good idea to photocopy the table of contents. As your knowledge of the subject grows, you will often find other chapters that you want to read and they are easier to retrieve if you make this copy. (If you are worried about copyright, don't be. Copyright laws have always allowed for copying for private study and research, so it is acceptable to copy individual papers and chapters. Copyright law stands to protect the author and publisher from lost income so, if you think you need to copy the whole book, then you should buy the book. On the other hand, if the book is no longer in print, there is no income for the author or publisher to lose, so it becomes harder to argue for a breach of copyright.)

Always Read the Documents You Collect (#3 Golden Rule)

The most expensive shirt you can buy is the one you never wear, even though it may have been a steal at the winter sales. It is the same with literature. You have wasted your time with the paper that you photocopy/download but never read, yet all of us seem to do this to some extent.

Sometimes, it is tempting to think that it is enough to read just the abstracts of the published work, but that is an error. Most abstracts offer little beyond a summary of methods and results, whereas real scholarship is built on an understanding of the issues and options attached to a particular problem. To get these, there is no real alternative to reading the main text. Moreover, an experienced examiner (instructor) can usually guess if a candidate has had a steady diet of abstracts, because the text usually lacks depth. (That is not to say that you cannot get away with it, because lots of people do, but they also short-change themselves.)

On the other hand, some documents are not worth reading because they are poorly written (few journals have the resources to rewrite articles, Nature and Harvard Business Review are a few of the exceptions). The main difficulty you face with these is in deciding whether it is your ignorance of the topic or the author's ignorance of the topic that is causing the problem but, in either case, the remedy is the same. Put the document aside for a few days or weeks and try again. Either one of two things will happen: (a) you will find that you have learned enough in the intervening period to come to grips with some difficult material or (b) you will find that you
have learned enough to realize that some people do get into print with poorly formed and poorly expressed ideas and that the document in question is one of them.

On the second reading, if you still have difficulty in deciding whether a difficult paper is good stuff or rubbish, try to remember that the scholars who know their material best are always the ones who can express it in the simplest way. All great ideas are really simple in essence. If a paper is hard to get into, it is often a sign that the authors themselves have not got into the topic as well as they might have and you might be better off not to invest too much time in it.

**Read Every Document with a Pen and a Highlighter (#4 Golden Rule)**

Usually, this advice is given under the heading of make good notes, but it is more than a matter of making notes.

I have yet to meet anyone with a truly photographic memory. Everyone I know seems to have a memory as poor as my own. Whenever I rummage through my collection of journal articles, I am always surprised that I find papers that I had read with great interest at the time but had since forgotten that I had even seen! Therein lies the argument for making notes, but we need to go beyond it.

Notes suggest something separate from the document. As a doctoral student, I kept an extensive card index file (I go back to the slide-rule era!). However, even though I wrote lots of notes on some cards, I found that their main use was to help sort documents into categories and then to retrieve individual papers (I filed them sequentially and put the number on the card). Whenever I wanted to write a project, I found I always had to go back to the original source because, even with the help of the notes, my memory was never accurate enough. There were always bits that I had overlooked, oversimplified, or distorted.

Eventually, I evolved to putting the citation on the card and some overall impressions of the paper just enough to jog my memory. I did the main work on the paper itself: highlighting bits that seemed significant or unusual and writing questions and comments in the margins. Not only did it make it that much easier to find things when I needed them, but it also brought the unexpected benefit of supplying verbatim quotes that I could use directly in introductions and discussions.

In short, my advice to you is to interact with each document you read. Make marks on it left, right and centre. The more you do this, the more it becomes something that you own and can use skillfully rather than just something that you read.

**Read All the Important Documents Twice**

It is surprising how much extra you will find in a document when you re-read it several weeks or days later. By that stage, you will almost certainly have a better grasp of the state of play in your project and will see questions, issues, and gaps that you had missed the first time.
Again, there is little point in doing this unless you do it with your pen and highlighter in hand. Put things like "rubbish", "important quote", 'I must use this", "Has overlooked Flintstone and Rubble's data", or whatever flags you need for yourself. Do not be reluctant to check calculations. It is surprising how many errors you can find and how much depth you will add to your review in discussing them.

It is a good idea to use the *Foundation for Critical Thinking* framework to assess the literature you find. The elements in this framework (see Figures 2 and 3) include:

1. The main **purpose** of this material (chapter, article, book, video, etc.) is……………… (State as accurately as possible the author’s purpose for this material. What was the author trying to accomplish?)
2. The key **question** addressed in this material is……………… (If not specifically addressed, figure out the key question or problem that was in the mind of the author when the material was developed. In other words, what key question or problem is addressed?)
3. The **context** of this material is………… (Identify the political, economic, social, historical, etc., background surrounding this material. This may include information on the existing knowledge on the subject and gaps in our existing knowledge.)
4. The main **point(s) of view** presented in this material is/are………… (Identify the author’s view (perspectives) of the topic? Points of view can be theoretical, ideological, religious, methodological, etc., and usually play a large part in determining the main assumptions (next item addressed.))
5. The main **assumption(s)** underlying the reasoning in this material is/are………. (Identify the generalizations the author does not think must be defended in the material. Assumptions are seldom specifically identified by authors. This is usually where the author’s reasoning begins.)
6. The key **concept(s)** in this material is/are……………. (Identify the most important ideas, theories, models, definitions, etc., used to support the author’s reasoning.)
7. The **alternative(s)** considered in this material is/are………… (Identify the alternative answers to the key question or alternative solutions to the problem at issue the author included in the reasoning.)
8. The most important **information** in this material is………………. (Identify the key information the author used to support his arguments/analysis. Identify the facts, data, evidence, experiences, etc., the author uses to reach their findings.)
9. The main **inferences** and/or **interpretations** of this material are………… (Identify the most important findings and conclusions the author presents in the material. What analysis methods were used. Do the findings follow a good logical argumentation approach? Are there any logic fallacies present?).
10. 
   a. If this line of reasoning is taken seriously, the **implications** and **consequences** are……
      (Identify the implications and consequences if the author’s findings and conclusions are taken seriously. Identify those both the author states and those not stated.)
   b. If this line of reasoning is not taken seriously, the **implications** and **consequences** are……
      (Identify the implications and consequences likely to follow if people ignore the author’s findings and conclusions.)
Social Science Research Critique Checklist (Rudestam & Newton, 1992)

The below checklist is provided as a guide for evaluating the strengths and weaknesses of studies you find in your literature search. Not all criteria will apply to every study—not will you be able to include all the below items in the summary/critique of individual works—so just focus on the high spots. This checklist highlights not only the items you should watch for in reviewing the literature in your study, but also provides a means for you to self-check the completeness of your own research project. This checklist is also useful when preparing book or article reviews.

**Conceptualization:**
What theoretical approach is used in the study?
What is the major problem or issue being investigated in the study?
How clearly are the major concepts defined or explained?

**Literature Review, Theoretical Framework, and Hypotheses:**
Is there a specific research question to conceptually focus the study?
Is there a literature review or review of past/ongoing research that establishes the context for the study?
Does the literature review include all independent and dependent variables included in the current study (structural studies only)?
Does the literature review clearly indicate what gap the current study will fill about our knowledge of the subject or major problem?
Are the relationships among the main variables explicit and reasonable (based on theory or logic)?
Are there hypotheses? Are they clearly stated?
Are the hypotheses stated in a way that makes them testable and the results, no matter what, interpretable?

**Research Design:**
What is the type of research design (qualitative, comparative, quantitative, etc.)?
Is it clear whether the study is descriptive, explanatory, or predictive?
Does the research design adequately address (or control for) extraneous variables?
Are the independent and dependent variables clearly and reasonably operationalized (structural studies only)?
Are the reliability and validity of the study discussed?
Is the population appropriate for the research question being studied?
What is the sampling method used (which probability or non-probability method)?
How is the sample drawn? What is the sample size used in the project?
For probability sampling methods, does this sample size provide a 95% confidence level?
For non-probability sampling methods, does the author properly justify their use?
Does the author generalize from the sample to a population in the conclusion?
If the author does generalize, is the population the same as the one from which the sample is drawn?
What do you think of the research report's generalizability?
Are limitations and biases in the study adequately discussed?
Could the research design be improved? How?
**Data Collection and Analysis:**
Are the data collection methods appropriate for the study?
Are the analytic techniques (qualitative, comparative, quantitative) appropriate and adequately described?
Are the control variables adequately handled in the data analysis?
Are there other control variables that were not considered but should have been?

**Findings:**
Are the findings of the study consistent with the results of the data analysis?
Are alternative findings that are consistent with the data discussed and accounted for?
Are the theoretical and practical implications of the results adequately discussed?
Are the limitations of the study noted?

**Conclusion/Summary:**
What is your overall assessment of the adequacy of the study for exploring the research problem?
What is your overall assessment of the contribution of the study to this area of research (how does it contribute to our knowledge of this subject or major problem)?
What is the next step in this research program (next step in researching this topic)?

**Organizing the Results of Your Literature Search**

It is recommended as you conduct your literature search that you compile a summary evaluation of the key facts and other critical information you intend to use in your project. A good way to do this is by creating a Quality of Information Checks matrix as shown in Table 5.

**Table 5. Quality of Information Checks**

<table>
<thead>
<tr>
<th>Source</th>
<th>Critical Information (Data, Evidence, Facts)</th>
<th>Corroboration of Information</th>
<th>Confidence Level (H, M, L)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>
An important part of any critical thinking analysis is assessing the points of view (perspectives) and assumptions present in a situation under analysis. You will conduct these assessments during your literature search and it will carry over to other steps in your critical thinking process. The points of view and assumptions you will assess will be of one or more actors in the situation being analyzed, the points of view and assumptions of authors of materials found in information searches, or even your own points of view and assumptions (to help avoid Blindsight Bias). Assessing these varied points of view and assumptions must be part of any rigorous critical thinking analysis.

Assessing points of view and assumptions are important as they frame the thinking and determine the actions in most situations. Brookfield (2012) offers there are three main categories of points of view and assumptions: **paradigmatic**, **prescriptive**, and **causal**. A mix of these three categories may be found in any situation. Once identified, each assumption must be assessed for its **accuracy** and **validity**. Accuracy entails making sure of the factual truth of the data, evidence, or information to determine its accuracy and completeness. Validity entails the employment of acceptable logic and reasoning supporting the assumption (i.e., assessing logic fallacies as detailed in Appendix 2). Assessing the validity of assumptions allows the analyst to identify manipulative or false reasoning in a situation.

Assumptions operate as instinctive guides to truth, something people seldom consider as the assumptions reside deep within a person’s cognitive map—or how people think about the situation at hand. Points of view and assumptions, even when determined to be accurate or valid, are hard to label as “right or wrong”—but usually just considered appropriate for the context in which they are employed. The analyst’s goal is not to change a person’s points of view or assumptions, but to identify and assess them in order to use them to explain or predict the person’s thinking or actions in the study of the situation at hand.

**Warning: More Mental Anguish Ahead.** As you learn to assess points of view and assumptions it will likely “bruise” your own belief system as you will likely start to question your existing points of view and assumptions. Everyone starts with a fairly well-developed “belief system” or “dominant ideology” based on inputs since birth from your parents, family, religion, schooling, media, etc., etc.,, and as you learn to assess others’ points of view and assumptions you will likely call into question many of your own. This is normal and is just one more step in becoming a critical thinker.
Paradigmatic Assumptions – concern the deeply held assumptions framing how a person views the way the world works—in other words the person’s “dominant ideology.” Paradigmatic assumptions go to the heart of a person’s points of view or personal belief system and include political, economic, religious, cultural, and social aspects of how the person views the way the world works. These assumptions usually spring from dominant ideologies (political, economic, religious, cultural, social, theoretical, etc.). For example, the dominant ideologies of democracy and capitalism are so persuasive in Western societies, that their core assumptions are often never questioned in analyses. Paradigmatic assumptions are often hard to uncover, especially by analysts whose thinking is also influenced by the same paradigmatic assumptions.

Prescriptive Assumptions – concern those assumptions defining for a person the desirable ways of thinking or acting. They define what “ought” or “should” be the desirable ways of thinking or acting. Prescriptive assumptions tend to flow from a person’s paradigmatic assumptions of how the world should work. For example, prescriptive assumptions might define the characteristics of a true democracy or how social resources ought to be allocated in a democracy. In addition to flowing from a person’s paradigmatic assumptions, prescriptive assumptions also result from the structure of laws, regulations, policies, rules, etc., applying to the situation under study. There are many social rules (both formal and informal) that influence thinking and behavior that are prescriptive assumptions.

Causal Assumptions – concern assumptions about the causal linkages that make the world work and conditions under which the causal linkages might change. For example, a causal assumption might indicate when Factor X leads to (causes, influences, etc.) Factor Y. In behavioral analysis (social science), the basic form of causal assumptions is when the cause, for example the human thinking, decision, behavior, or condition in Factor X, results in or causes a change in the human thinking, decision, behavior, or condition in Factor Y (the issue under study). In the hard sciences, causal conditions are much easier to assess as they have been established through repeated valid experiments. In the behavioral or social sciences, causal conditions are much more elusive due to the complexity of human behavior and the lack of valid research in many aspects of human behavior. Causal assumptions related to behavioral or social science are often deemed invalid because of the small sample size of cases governing the proposed causal linkages (see later section on Sampling Theory). For example, just because one person or a small group of people behave in a certain way, does not mean their behavior can be generalized to the future behavior of a larger group of people. Or, just because someone behaves in a certain way in one situation, does not mean they will behave the same way in future situations. Also, it is common to find causal assumptions offered in arguments with no corresponding basis in data, evidence, or information (i.e. facts), thus it is important to always check the accuracy and validity of all facts presented to support and argument.

To assist in assessing points of view (perceptions) and assumptions, the analyst should first employ two structured analytic techniques used in intelligence and policy analysis—Four Ways of Seeing and Key Assumptions Checks.

Four Ways of Seeing is a technique allowing the analyst to delineate differing points of view or perspectives for one or more actors using a simple matrix analysis technique. Under each block in Figure 6, the analyst or team of analysts will list the different points of view or
perspectives by separate actors in each situation. Figure 6 blocks may be further subdivided to assist the analytic effort, for example, the analysts may sub-divide each block to assist in assessing each perspective. For example, the analyst may want to list the public messages the actor provides, while also listing the actions the actor may have taken. This is often true of politicians or other senior officials, where what they “say” does not always match what they “do.”

**Figure 6. Four Ways of Seeing**

<table>
<thead>
<tr>
<th>How does Actor A view her/himself and/or the issue at hand?</th>
<th>How does Actor B view her/himself and/or the issue at hand?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessing Differing Perspectives</td>
<td></td>
</tr>
<tr>
<td>How does Actor A view Actor B her/himself and/or vis-a-vis the issue at hand?</td>
<td>How does Actor B view Actor A her/himself and/or vis-a-vis the issue at hand?</td>
</tr>
</tbody>
</table>

The analyst should also attempt to determine the sources of the actors’ perspectives. For example, are the perspectives based on the actor’s dominant ideology (political, economic, religious, cultural, social, theoretical, etc.)?

**Key Assumptions Checks** is a technique to explicitly list and challenge the key assumptions underlying an analysis. Heuer and Pherson (2015) offer how Key Assumptions Checks safeguard analysts against several classic analyst mental mistakes, including the tendencies to overdraw conclusions, weight first impressions too heavily, and fail to factor into their thinking the absence of evidence.

Preparing a written list of your working assumptions at the beginning of your project will help you:

- Achieve a better understanding of the most important dynamics at play.
- Gain a broader perspective and stimulate new thinking about the issue.
- Discover hidden relationships and links between factors.
- Identify what developments would call a key assumption into question.
- Avoid surprise should new information render old assumptions invalid.
The process of conducting a Key Assumptions Check is straightforward in concept, but can be challenging in practice. Statistically speaking, about one in four assumptions collapses upon careful examination. To conduct your Key Assumptions Checks, it is best to gather a small group of individuals who are working the issue as well as a few "outsiders" who can share other perspectives.

Participants should provide their initial list of assumptions on 3x5 cards. Next:

- **Record all of the assumptions** on a whiteboard or easel (list under separate categories of paradigmatic, prescriptive or causal assumptions).

- **Elicit additional assumptions**, using various devices to prod participants' thinking, such as using 5Ws + 1H (generating questions using: Who, What, When, Where, Why and How?), the above Four Ways of Seeing technique or other individual or team brainstorming techniques.
  
  o Watch for phrases such as "will always," will never," or "would have to be," which suggest that an idea is not being challenged. Perhaps it should be!
  
  o Watch for phrases such as "based on" or "generally the case," which suggest that a challengeable assumption is being made.

- **After developing a full set of assumptions**, go back and critically examine each assumption, to determine its accuracy (quality of information) and validity (quality of logic and reasoning). Some additional questions to ask include:
  
  o Why am/are I/we confident the assumption is correct?
  
  o In what circumstance might it be untrue?
  
  o Could it have been true in the past but no longer be true today?
  
  o How much confidence do I/we have that the assumption is accurate or valid?
  
  o If it turns out to be inaccurate or invalid, how much impact would this have on the analysis?

- **Assess each assumption** by one of three measures:
  
  o Basically supported or solid.
  
  o Correct with some caveats.
  
  o Unsupported or questionable - these are "key uncertainties," which often merit additional investigation.

- **Refine the list**, combine or refine assumptions ad necessary, adding new ones that emerge from the discussion. Develop a final summary list of the Key Assumptions Checks using the Table 6 matrix format.

- Use the final list to inform your analysis.

### Table 6. Summary of Key Assumptions Checks

<table>
<thead>
<tr>
<th>Key Assumptions</th>
<th>Category//Comments</th>
<th>Solid</th>
<th>With Caveats</th>
<th>Unsupported</th>
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Perspectives & Assumptions: Cultural Assessments

Differing Political and Organizational Cultures

There are considerable differences in the cultures of individual organizations just like there are differences in the civilizations or cultures of states and nations. The nature of an organization’s or state’s culture is an important but often overlooked factor in evaluating organizational behavior and a state’s political and economic conditions. Culture is not just about the language, music, dance, dress, religions, history, and literature of a state, nation, or other societal group. In its most general sense, **culture defines the social rules surrounding lifestyles, beliefs, customs, and values that influence an organization’s or society’s pursuit of their goals.** The remainder of this section talks specifically about political culture; however, the material described is equally applicable to analyses of organizational cultures.

**Political culture**, a sub-set of overall culture, defines the general process used by an organization or society to reach its political goals (i.e., reach decisions about who gets what, when, and how (Lasswell, 1950)). Classifying political cultures includes determining how a society is politically organized, both formally and informally; how political decisions are made; how political power flows within the societal organization; how both the governing elite and the mass citizenry view their roles in politics; and how citizens interact, both with the government and among themselves, to reach their political goals (Diamond, 1993). This discussion argues that political culture (or organizational culture) is a major factor in explaining societal output or behavior.

Since Almond and Verba’s (1963) groundbreaking work *The Civic Culture* first associated culture and modernization, there have been many scholarly attempts to both classify differing political cultures and to use political culture as a variable to explain the strength of democracies and levels of development within states (Huntington, 1968; Putnam, 1993). A synthesis of the political culture literature reveals three principal types of political culture—**collectivist, individualistic,** and **egalitarian.** Understanding the differences in these three types of political cultures is a first step in understanding the varying political and economic conditions in societies.

**Collectivist Political Cultures**

Collectivist (traditional) political cultures generally exist in states with hegemonic forms of rule. Hegemonic rule indicates that a central single-ruler or small governing elite monopolize and mandate, through either coercion or cooption of the institutions of the society, the principles and beliefs (ideology) of the society (Onuf, 1989). Hegemonic rule is normally found in totalitarian, sultanistic, dictatorial, and other authoritarian types of governments.

Collectivist societies are simple and segregated. Social and economic transactions in collectivist societies are organized around small groups defined by familial, kinship, tribal, political, ethnic, religious, class, linguistic, or other social relationships. Each group tends to have its own narrow base of interests. Paternalism is the main intra-group controlling concept in collectivist cultures, i.e., the father or group leader decides what is best for the family or group. The **best interest of**
**the governing group** is the single most important rule in collectivist societies. Loyalty to the group and maintaining the traditional status quo are other important rules in collectivist cultures. With most social and economic transactions carried out within groups (intra-group), the levels of inter-group social trust in collectivist cultures is extremely weak (Fukuyama, 1995).

Collectivist political cultures place power in the hands of a small and self-perpetuating governing elite who often inherit the right to govern through family ties or social position (Elazar, 1966, pp. 92-93). The hegemonic rule in collectivist states is often personalistic. The method of rule often relies on strong patron-client systems of informal reciprocity, where the clients (citizens or specific groups) pledge their economic and political support to patrons (governing elite) for access to government resources (Klitgaard, 1988, pp. 69-74). Political competition in collectivist societies is primarily among the small group of self-perpetuating governing elite. Politics is considered a privilege in collectivist political cultures and those active in politics are expected to benefit personally from their efforts. Collectivist polities are centrally organized with the powerful governing elite constituting the central core of the most dominant societal group. The rule of law is weak in collectivist political cultures, focused primarily on controlling the masses and offering little accountability for the governing elite.

Patrimonial economic and resource management systems are normally associated with collectivist political cultures. Patrimonial systems foster maximum government control by limiting which classes of citizens (normally only the governing elite) have access to material resources. In these systems the small governing elite tightly control the economy and decide, often capriciously, how state-owned resources are distributed. Patrimonial systems are usually not transparent and provide almost unlimited opportunities for rent seeking activities. The governing elite are given the opportunity to use the national treasury and state-owned resources as if they were their own personal property, and decide what, if any, resources may be distributed for the public good. To maximize their access to societal resources, governments with patrimonial systems maintain strict control over their economies, usually including high levels of protectionism of foreign trade (high tariffs, etc.), high personal and corporate taxes, government ownership of major enterprises (public utilities, basic foodstuff production, etc.) and infrastructure (ports, airports, railroads, etc.), strict wage and price controls, and a variety of regulations (licensing, contracting, customs procedures, etc.) that allow maximum rent seeking (corruption) by government officials. One analysis of underdeveloped societies found that where extensive patrimonialism existed, “the majority of the population are more or less permanently excluded” from the benefits of state resources (Theobold, 1990, p. 91).

**Individualistic Political Cultures**

Individualistic political cultures exist in hierarchical ruled states. Bureaucratic pyramids and military chains-of-command are typical structures associated with hierarchical rule, a situation where a changeable (by regular elections, but not always free and fair ones) governing elite dominates the very top of the hierarchy (Onuf, 1989). Hierarchical forms of rule are normally found in transitional or weak democracies.
Individualistic societies are more integrated and complex than collectivist societies. Within individualistic cultures, social and economic transactions are conducted among people from different groups. Individuals frequently shift from one group to another and have a broader range of interests. **Individual self-interest** is the governing rule of these cultures. The need to interact with persons from other groups in order to serve one’s own self-interest results in a moderate level of social trust.

Individualistic political cultures view government as strictly utilitarian—to provide those functions demanded by the citizens it serves (Elazar, 1994, pp. 230-232). Individualistic political cultures see politics as a business—another means by which individuals can improve themselves socially and economically. Political competition revolves around individual attempts to gain and maintain political or economic power. Politicians in individualistic societies are more interested in public office as a means for self-interested advancement than as a chance to build a better society. Political life in individualistic political cultures is based upon systems of mutual obligation rooted in personal relationships. These systems of mutual obligation are usually harnessed through the interactions of political parties and interest groups. Citizen participation in political decision-making is conducted through networks of political parties and interest groups that attempt to influence government policy. Patron-client relationships generated by the system of political parties, interest groups, and large government bureaucracies emerge in individualistic political cultures. Individualistic political cultures are extremely legalistic. However, the rule of law, while stronger than in collectivist societies, remains focused primarily on controlling the masses and generates only limited accountability for the governing elite.

Statist economic and resource management systems are normally associated with individualistic political cultures. Statist systems find less government control of a state’s economy and state-owned resources than in patrimonial systems. Statist systems utilize a mix of patrimonial and free market mechanisms to manage their economies, while still providing the governing elite ample opportunities for rent seeking. Knowing that their opportunities to accumulate capital are dependent upon their control of the state’s resources and economic processes, governing elite in statist systems strive to ensure they play key decision-making roles in economic and state resource management. Statist systems include some protectionism of foreign trade, some government ownership of key enterprises and infrastructure, and a special emphasis on regulations (licensing, contracting procedures, etc.) that allow substantial rent seeking by government officials. In effect, governing elite in statist systems see the state’s economy and state-owned resources as their own private business resources and regulate them in a manner providing ample opportunity for illicit capital accumulation (Manzetti & Blake, 1996).

**Egalitarian Political Cultures**

Egalitarian (civic) political cultures are ruled by heteronomy. Heteronomous rule indicates a lack of autonomy, i.e., the governing elite are severely restricted by societal institutions in their behaviors (Onuf, 1989). Heteronomous rule is normally found in strong democracies where the governing elite change often as the result of free and fair elections.
Egalitarian societies are highly integrated and complex. Social and economic transactions in egalitarian cultures are conducted widely among a variety of differentiated groups. Individuals belong to several political, economic, and social groups and have a large array of interests. Due to the widespread horizontal interactions across differentiated groups, high levels of social trust develop in egalitarian cultures (see Fukuyama, 1995). Egalitarian cultures are generally found in developed states receiving both their population stream and political ideology from Northern Europe.

Egalitarian political cultures see politics as a public activity centered on the idea of the public good and devoted to the advancement of the public interest. The search for the common good (what is best for society) is the controlling rule of politics. Egalitarian political cultures view politics as healthy and promote the wide-scale involvement of civil society in political decision-making. Egalitarian political officials vie for power just as those in other societies; however, their ultimate objective is less self-interested advancement and more the search for a good society. Egalitarian political cultures flatly reject the notion that politics is a legitimate realm for private economic enrichment. While political parties and interest groups exist in egalitarian political cultures, their influence on political decision-making is weaker and they have less impact on government policy than in individualistic societies. Political competition is focused on societal issues. Egalitarian government structures are organized hierarchically, however, their bureaucracies tend to be smaller than similar sized individualistic societies and their political decision-making processes tend to be more horizontal, including both public and private groups. The rule of law is strong in egalitarian political cultures, applying equally to the masses and governing elite.

Market economic and resource management systems are normally associated with egalitarian political cultures. Market-based systems present the neo-liberal ideal of free and open economies and efficient state-owned resource management. Taking their lead from the works of Smith (1937) and Ricardo (1960), market systems view the only role for the state in the economy is to provide public goods that the market is unable to provide (monetary systems, public transportation infrastructure, etc.). State ownership of enterprises is contemplated only if the enterprise has no competition and state-ownership is in the public’s best interest. Market systems enjoy maximum economic transparency and openness. State-owned resource management in market systems is also highly efficient and transparent. Overall, market-based systems present the fewest opportunities for government rent seeking.

**The Impact of Culture**

Understanding a situation’s competing political cultures is important as each of the above three types of political culture—collectivist, individualistic, egalitarian—support differing conditions in a society, especially in terms of the form of rule, type of government, and system of economic management. Table 7 displays the general conditions associated with the three types of political cultures.
Table 7. Coordinates of Culture

<table>
<thead>
<tr>
<th>Type of Culture</th>
<th>Egalitarian</th>
<th>Individualistic</th>
<th>Collectivist</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal is the good of the...</strong></td>
<td>Entire Society</td>
<td>Individuals</td>
<td>Leaders/Elite</td>
</tr>
<tr>
<td>Types of Government</td>
<td>Mature or Strong Liberal Democracies</td>
<td>Transitional or Weak Democracies</td>
<td>Authoritarian</td>
</tr>
<tr>
<td>Political Process—Actors that Most Affect Decisions or Policy</td>
<td>All Actors Eligible (Exact Actors Differ by Issue)</td>
<td>Interest Groups, Legislature, Gov’t Orgs. Executive Advisors and Executive</td>
<td>Executive Advisors and Executive Only</td>
</tr>
<tr>
<td>Levels of Elite Accountability</td>
<td>Significant</td>
<td>Some</td>
<td>Little</td>
</tr>
<tr>
<td>Economic/Resource Management Systems</td>
<td>Market</td>
<td>Statist</td>
<td>Patrimonial</td>
</tr>
<tr>
<td>Levels of Social Trust or Social Capital</td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Levels of Mass Participation</td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
</tr>
<tr>
<td>Elite Corruption Behaviors</td>
<td>Paragons</td>
<td>Opportunists</td>
<td>Pirates</td>
</tr>
<tr>
<td>Societal Political Corruption Patterns</td>
<td>Incidental (Low)</td>
<td>Institutional (Moderate)</td>
<td>Systemic (Severe)</td>
</tr>
</tbody>
</table>

Reforming a state’s political culture as part of development efforts is an area seldom addressed in domestic or international forums. Booth and Seligson (1993) argue that some states may not be good candidates for political and economic modernization because the local political cultures are so antithetical to liberal-democratic values. This discussion supports this controversial assertion. In particular, the above discussion supports the conclusion that a collectivist political culture can act as an anchor that holds-back a society in its attempts to develop the institutions needed in market-oriented and strong liberal-democratic states.

Most world developing states exhibit collectivist or mixed collectivist-individualistic political cultures. Collectivist political cultures are organized around social groups and are extremely paternalistic—always looking to the group leader for resources or solutions to problems. In collectivist cultures, the good of the ruling group prevails over the good of individuals or the
greater society. Thus, a state’s type of political culture can set limits on its ability to develop. In most of the developing world, the success of implementing neo-liberal market and liberal-democratic reforms is therefore directly related to the success of transforming a state’s collectivist or collectivist-individualistic political culture. Changing the social rules of collectivist political cultures, some steeped in hundreds of years of strongman, oligarchic, or other forms of elite rule, is not an easy task. In fact, it is not a task anyone has ever really tried.

Perspectives & Assumptions: Theoretical Assessments

Note: This section provides material on assessing different theoretical perspectives as part of your assessments of points of view and assumptions. It will also be used in your thinking in developing your project’s conceptual framework.

Do Not be Afraid of Social Theory

Theories are nothing more than statements of relationships among variables. Theories allow us to explain and predict how the world around us works. Social theories designate relationships among variables with a focus on explaining or predicting human behavior, human decisions, or human conditions. There are thousands of social theories in existence. Some of these social theories you will learn in your course work, some in your course research, and some from just reading or watching television and movies. The purpose of this section is to introduce the structure of social theories and how to use them in assessing differing perspectives and assumptions and for developing the theoretical framework and conceptual framework for your own research. The section starts with a fairly involved discussion on the structure of theory and social science, then provides some practical guidance on building structural theories from the literature on a topic, and then ends with some basic information on social theory that will help you in reading the literature and understanding the theories used.

Where Does Our Knowledge of How the World Works Come From?

Our knowledge of how the world works comes from seven generally accepted methods, also known as categories of epistemologies. If you could go back and classify every piece of knowledge you now have, it would come from one of these seven categories of epistemology. Thus, any single individual’s knowledge is based on a combination of all seven categories of epistemology.

1. Authority: When an expert or someone in authority (parent, teacher, dictator, pundit, etc.) provides you the knowledge (and you tend to believe and not challenge it). This type of knowledge cannot be replicated, which means it cannot be studied.

Note: Much of what you read in the professional government, national security, international relations, public administration, or intelligence literature falls into this category. Many famous or high-ranking persons will give their opinion on an issue in a government report, newspaper editorial, non-academic journal, etc., however, there is usually little empirical data or systematic analysis to support the opinion. Even though some of these opinion pieces may be from highly
informed sources (Henry Kissinger, a Secretary of Defense, etc.), that does not mean they can pass the scrutiny of the scientific method. Therefore, be extremely careful about using this professional opinion-based literature in your formal research.

2. **Faith**: When you accept the knowledge with no evidence required to back it up (i.e., it is without any empirical basis) (e.g., religious ideology, myths, etc.) Also called revelation or “divine inspiration,” this type of knowledge cannot be replicated.

3. **Intuition**: This is knowledge with no conscious reason for knowing. It comes from internal plausible beliefs or implicit connections. It is often without an empirical basis (facts, data, evidence)—you just seem to know it is true (e.g., Teacher’s intuition—they just seem to know when you were doing something wrong). This type of knowledge cannot be replicated—thus you cannot assess it for reliability or validity.

4. **Common Sense**: Externally obtained plausible knowledge—i.e., “everybody knows it.” It is often contradictory and usually too general to be studied. It cannot be studied empirically or replicated.

5. **Rationalism**: Knowledge generated through logic and reasoning (theorizing), based upon the human ability to reason separately from their actual experiences with the real world. This is the realm of theory.

6. **Empiricism**: Knowledge gained from your experiences, your observations and gathering of data, facts, evidence, etc., with your five senses. To *brute-empiricists* only the empirical data matters. Like Sgt. Joe Friday says, “Just give me the facts ma’m!” (For you youngsters, Sgt. Joe Friday was the lead character on the 1960’s TV program *Dragnet.*

7. **Science (includes Social Science)**: Knowledge gained through a combination of rationalism and empiricism. The scientific approach offers that rationalism and empiricism alone may not always be right, but if you use the two in tandem, you are much more likely to get the knowledge right. Its procedures allow you to assess reliability and validity. As social scientists, this is the epistemology we follow in studying human behavior, human decisions, and the human condition. In a nutshell, research methodology, the art of finding out, is nothing more than the procedures we used to combine rationalism and empiricism such that we produce science. Critical thinking is closely related to following the scientific method.

**Peeling Apart How Social Science Works**

**The Wheel of Science**

The first way to understand how science or social science works is to look at the Figure 8 wheel of science (social science).

Figure 8 offers that a social science (deductive) study normally begins with the researcher developing a puzzle and a research question. Once the puzzles/questions are initially developed, the researcher then begins a literature search to see what others have found in investigating the
same or similar questions. During the literature search the researcher will find what variables or models others have used in their studies. The researcher then identifies or builds theory or models they can use in answering the research question while filling some of the gaps in the current literature. From the causal diagram or model, the researcher develops specific hypothesis (es) which are potential answers to the research question. Once the hypothesis(es) are written, the researcher then goes through a research design process where they determine which type of study, what types of cases, and what population(s) and sample(s) are best suited for testing the hypothesis(es). During the research design the researcher also operationalizes the study’s variables (i.e., determines how they will be measured), the data collection and analysis methods they will use, and what biases and limitations the study may have. The research project then continues on to the data collection and data analysis phases. Upon completion of the data analysis, the researcher then compares their results to the existing literature and theories and, and once published the research becomes part of the existing literature on the topic.

Note: The wheel of science is basically the same as the Figure 3 Critical Thinking Social Science framework.

**Figure 8. Wheel of Science** (traditional approach)

![Wheel of Science Diagram](image)

**A More Conceptual View of The Scientific Method** (aka: positivism, logico-empricism, empirico-rationalism, Vienna method)

Below is a diagram, definitions, and example, to help demonstrate how the tenets of rationalism and empiricism fit together and constitute the scientific method. In this diagram, every concept is directly related to concepts on either side of it, and directly above or below it.
First to the **Rationalism** level of the above diagram. Remember **Rationalism** offers that knowledge can be generated through logic and reasoning, based upon the human ability to reason separately from their actual experiences with the real world.

**Theory** is an explanation of relationships among variables. Theorizing (i.e., the use of logic and reasoning) is the main activity of rationalism. Theory describes relationships that might be expected among variables (or how does the world really work). Theory comes in lots of different forms which you will learn later.

**Theoretical Propositions**: Statements about the nature of relationships among variables or how the world works. Theoretical propositions take on several forms:

- **Assumptions**: Propositions taken to be true even though they often cannot be proven or disproven. Most theories have a number of assumptions about how the world works that support their theories. For examples, in Marxist theory, it is assumed a state’s type of economic system determines its political and social structures.

- **Axioms (Theorems)**: Propositions taken to be fact (true) as they have been repeatedly supported by logic, reasoning, or mathematical proof, e.g., The Central Limit Theorem in statistics allows us to use only one representative sample to infer to a larger population.

- **Postulates**: Propositions taken to be fact (true) as they have been repeatedly supported by empirical data, e.g., in the Democratic-Peace literature it has been shown repeatedly that no two democratic states have ever gone to war with one another.

- **Laws**: Propositions that have withstood so much scrutiny over time that they are considered the truth. (Note: There are very few, if any, laws in social science.)

Theories are thus nothing more than a collection (semi-coordinated listing) of theoretical propositions (assumptions, axioms, postulates, laws) that explain the relationships among variables in a topic area. As you will learn in your core, major, and elective courses, all theories have different assumptions, axioms, postulates, and laws.

Examples of theoretical propositions:

1. The greater the economic instability in a state, the lower the political satisfaction.
2. When competing states are both democracies, they will not resort to violent conflict to resolve disagreements.
3. Developed states will exploit undeveloped states to obtain their natural resources and labor at lower costs.
4. Being a member of an alliance will increase a state’s chances of going to war.

**Theoretical Concepts**: Abstract symbols (or words) used in constructing theoretical propositions (i.e., in defining variables). A symbol is an information conveyor whose form is arbitrary and
whose meaning is determined by those who use it. In a nutshell, this means we never deal with reality itself, but only through symbols (words, etc.).

Examples of abstract theoretical concepts (see above theoretical propositions):

- Economic instability
- Political satisfaction
- Democracy
- Violent Conflict

<table>
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<th>Theoretical Propositions</th>
<th>Theoretical Concepts</th>
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Now to the Empiricism level of the above diagram. Remember Empiricism offers knowledge is gained from your experiences, your observations and gathering of data, facts, evidence, etc., with your five senses.

**Research**: Systematic observation of a phenomenon to test or advance a theory or from which to induce a theory. Research is the main activity of empiricism. Research can be categorized in several ways:

Categorized as to **type** of social science study (one of the items you determine in developing your research questions):

Descriptive—answers the **who, what, where, and when** questions about the phenomenon (e.g., human behavior) under investigation. Journalists and historians are experts at descriptive research. Most descriptive research is done using the historical approach.

Explanatory—answers the **why** and **how** questions about the phenomenon under investigation. Social science focuses most of its efforts on explanatory research. **Note**: qualitative researchers often use the term “understanding” in lieu of explaining.

Predictive (estimating, forecasting)—answers **what will (or could) happen** questions about the phenomenon under investigation. Also a primary interest to social scientists, predictive research tells us what the future will look like or how to change the world of social practice. In many cases, you have to explain a phenomenon before you can predict its future. In other cases, if you observe a phenomenon’s regular occurrence, without explaining it you can predict it will continue to follow the observed pattern. Intelligence analysts are usually the most proficient with predictive research methods.
Research can also be categorized by its purpose:

**Pure (Basic) Research**—is driven by the interests or puzzles of the researcher and may or may not have any policy or other effect on the world of social practice.

**Applied Research**—is driven by policy considerations. The intent is to use the research to change the world of social practice (i.e., for social engineering, policy-making, or problem solving).

**Research Hypotheses:** Specific statements about relationships among variables such that they can be studied (tested). Research hypotheses add specificity to theoretical propositions. Research hypotheses are no more than a sentence (statement) explaining how one or more independent variables impact a dependent variable.

**Research hypotheses are always written in terms of how a change or condition in one or more independent variables causes a change or condition in the dependent variable.**

**Dependent Variable:** this is the factor or variable (i.e., the human behavior, decision, or condition) that we are trying to explain or predict.

**Independent Variable(s):** this/these are the factor(s) or variable(s) that cause the change in human behavior or condition in the dependent variable. Independent variable(s) are often called the causal factor(s) or drivers.

Examples of Properly Written Research Hypotheses:

As $X_1$ (independent variable) increases, $Y_1$ (dependent variable) increases.

As the $X_1$ (independent variable) condition of (…) occurs, $Y_1$ (dependent variable) will take on condition (…).

When independent and dependent variables move in the same direction (both increase or decrease together) then the relationship is considered *direct*. When the independent variable increases while the dependent variable decreases, or vice versa, (i.e., they move in opposite directions) the relationship is considered *inverse*.

Example Research Hypotheses (see the corresponding above Theoretical Proposition examples to see how they have been changed to allow their testing as hypotheses):

**Hypothesis 1** As economic instability increases in Brazil, there will be lower political satisfaction.

**Hypothesis 2** Since the United States and Mexico are both democracies, they will not resort to violent conflict to resolve border control issues.
Hypothesis 3 European states continue to exploit undeveloped states in Latin America by paying 50% less than world market prices to obtain their agricultural products.

Hypothesis 4 Since the U.S. was a member of NATO, it was forced into the war in Bosnia.

**Hypothesis Reality Check:** When writing hypotheses, you should be careful to make sure the dependent variable is expressed in the same conceptual terms (same words) in both the specific research question and in each hypothesis. Using the Hypothesis 1 example above:

If the specific research question was: **Will political satisfaction in Brazil decrease?** (a predictive study).

Then the proper wording for Hypotheses 1 would be:

**Hypotheses 1; Political satisfaction in Brazil will decrease as economic instability increases.**

Note that this sample Hypotheses 1 still shows the inverse relationship between the dependent and independent variables, however, it is worded so that it presents a direct answer to the specific research questions and so that the dependent variable in both the specific research question and the hypothesis are consistent.

**Operational Definition:** The set of procedures that describe the activity used to *establish the existence, or degree of existence*, of a phenomenon you are seeking to describe (i.e., the independent and dependent variables). Our goal is normally to develop a set of attributes or measures of the independent and dependent variables. The measures may entail our *objective* measurement of the variables—using our five senses. Or, we may be faced with defining the variable *intersubjectively*—whereby even though we cannot observe the variable directly (i.e., objectively with our senses)—if we agree that the concept exists we can devise a way to measure it (e.g., applies to concepts such as love, fear, hate, trust, etc.). Operational definitions must delineate unique qualities of the variables (attributes) without over- or under-generalizing. More information on measuring variables will be covered in later sections.

**Figure 9. Sample Operational Definitions**

<table>
<thead>
<tr>
<th>Concept/Variable</th>
<th>Operational Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of life</td>
<td>Income per year</td>
</tr>
<tr>
<td>Human capital</td>
<td>Education and health levels</td>
</tr>
<tr>
<td>Population density</td>
<td>Number of people per kilometers-squared</td>
</tr>
<tr>
<td>Habitat destruction</td>
<td>Number of acres or species that disappear</td>
</tr>
<tr>
<td>Temperature</td>
<td>Readings on a thermometer</td>
</tr>
<tr>
<td>Popularity</td>
<td>Results of a vote</td>
</tr>
<tr>
<td>War</td>
<td>Number of casualties per year</td>
</tr>
</tbody>
</table>
A primary goal of social science is to establish **causality**. Four things are required in order to establish causality.

1. **Time ordering.** The change or condition in the independent variable must always occur before the change or condition in the dependent variable.
2. **Non-spuriousness.** There cannot be a third variable that is causing both the independent and dependent variables to change.
3. **Co-variation.** We need proof that as the independent variable changes, there is a corresponding change in the dependent variable.
4. **A Theory.** Empiricism alone cannot establish causality. We need a theory (from the rationalism level) to tell us why the causal relationships exist.

### Diagramming a Theory or Model

One thing a researcher must do early in designing an explanatory or predictive research project is to establish an abstract model or diagram—by abstract we mean that the model of diagram is a simplified model that explains or predicts the relationship between variables in our study’s theory. The causal model or diagram can take on a number of forms. The model can be a narrative listing of theoretical propositions, logic or flowchart models, mathematical models, or simple structural models using line and block diagrams, or a variety of other models that demonstrate the relationships between variables. Where do the causal models or diagrams come from? First, the researcher must search the existing literature on the research topic and see what causal models or diagrams other researchers have used to answer the same or similar research questions. A critique of this literature often allows the researcher to either add additional variables to existing models or use different cases to test the same hypotheses used in other studies. Second, the researcher may be forced to synthesize several existing theories into a more robust or comprehensive causal model or diagram—this is especially true when dealing with structural causal models. Third, the researcher may be required to rely on their own logic and power of reasoning to develop their own causal model or diagram when a suitable model is not available in the existing literature. No matter where the causal model or diagram originates, all social science explanatory and predictive studies—including qualitative case studies—employ some type of causal model or diagram. Remember: the primary goal of social science research is to add to our cumulative knowledge about your research topic—this is done through developing a causal model or diagram and then testing the hypotheses that the model or diagram produce.

The simplest structural causal model or diagrams are no more than line and block diagrams that establish the relationships between variables. These may include several combinations of causal relationships.

Legend: $Y_1$ is the dependent variable (the human behavior, decision, or condition we are trying to explain or predict), $X_{1-4}$ are the independent variables (the factors that cause changes or conditions in $Y_1$).
When there is a single **direct** or **inverse** relationship:

![Diagram of direct or inverse relationship]

When there is an **intervening** variable:

![Diagram of intervening relationship]

When there is an **antecedent** variable:

![Diagram of antecedent relationship]

For most beginning researchers, a structural causal diagram with 4-6 independent variables and 1 dependent variable is normal. After searching the literature on what causes differences in personal income levels in the United States, the resultant structural causal diagram for this study should appear similar to the following:

\[
Y_1 = \text{Income} \\
X_1 = \text{Education} \\
X_2 = \text{Age} \\
X_3 = \text{Type Job} \\
X_4 = \text{Location}
\]

![Diagram of causal variables]

Causal diagrams come from the level of rationalism (theory), specifically from theoretical propositions. After designing a study’s causal diagram, the researcher then writes the research hypotheses or sub-hypotheses that pertain to that study. Here the hypotheses would include:

Hypothesis 1 As education level increases, income will increase.
Hypothesis 2 Older people will have higher incomes than those younger.
Hypothesis 3 People with professional jobs have higher incomes than agricultural workers.
Hypothesis 4 People in urban areas have higher incomes than those in rural areas.

**Hints on Developing Theories for Your Research**

Since there are thousands of social theories and models that have been developed, it often becomes confusing as to where to start on developing a theory or model for your study. First you must develop a specific research question and then conduct a literature search on that specific research question in order to determine which theories other researchers have used to answer your same or a similar research question. You have several choices for developing the theoretical framework in your study:

1. You can use the theories or models other researchers used (but here you need to at least adjust the theories or models some (i.e., add or delete independent variables) or you won't really be filling any gaps in our knowledge with your study (i.e., studying the same case with the same theory does not fill any gaps--unless there was a major error in the first researcher's research design).

2. You can select theories or models (old ones or new approaches) which have not been used (here you must be knowledgeable of the theories and models that are out there for use--as a new social scientist that is really not the case for most students--by the end of your degree program you will have a much greater understanding of the theories and models used in your field).

3. You can develop your own structural theory or model as described below.

**Building Structural Theories from the Literature**

When developing your own structural theory, most researchers look at the material from the literature search and select the independent variable(s) used in other studies that have been best at explaining the variance (changes) in the dependent variable. You can also include other independent variables to your structural theory that you think will add to explaining the variance (changes) in the dependent variable. If you add your own independent variables, which other researchers have not used, then you need to make sure in your paper's Theoretical Framework section that you provide an in-depth discussion of the logic and reasoning for including your variable(s). For independent variables used by other researchers, you can just refer to their study in the Literature Review section to justify their inclusion in your model. Likewise, you also must justify leaving variables out of your model which others have used. Once you have gone through this structural theory development process you will have a structural theory with one or more independent variables which offer to explain variances (changes) in a dependent variable (we usually call this a causal model or causal diagram).

**Nations at War: A Real World Example of a Structural Causal Model**

Geller and Singer (1998) provide a unique book as in effect it is a giant literature review of over two centuries worth of studies on the causes of war. When a study combines a number of previous studies it is called a *Meta-Analysis*. Geller and Singer’s meta-analysis resulted in the development of a number of models that explain at different levels of analysis why past wars
started based on the independent variables receiving the most empirical support (data, facts, evidence, etc.) in almost two centuries worth of research.

The Geller and Singer model for predicting War-Prone Dyads (2 states), which can also be used for explaining the outbreaks a dyadic wars, is summarized below. Geller and Singer’s work reveals that within the many theorized causes of war over the last two centuries, the below independent variables have the strongest empirical support and thus are the most compelling in explain and predicting war outbreaks.

Y₁ = Probability of Two States Going to War

X₁ = Static Capability Balance
Theoretical Proposition: Two states that are near parity in static capability balance (territory/population + military capabilities + economic output) are more likely to go to war. (Comes from Balance of Power Theory)

X₂ = Dynamic Capability Balance
Theoretical Proposition: Two states that have had recent significant changes in their capability balances are more likely to go to war. (Comes from Balance of Power Theory)

X₃ = Contiguity/Proximity
Theoretical Proposition: Two states that share borders or are located short distances apart are more likely to go to war. (Based in empirical fact)

X₄ = Alliances
Theoretical Proposition: Two states that are part of unbalanced external alliances are more likely to go to war. (Comes from Balance of Power Theory)

X₅ = Regimes (Political Systems)
Theoretical Proposition: Two states that are not both democratic regimes are more likely to go to war. (Comes from Democratic-Peace Theory)

X₆ = Economic Development
Theoretical Proposition: Two states that do not both have advanced economies (industrialized, technology-based, etc.) are more likely to go to war. (Comes from Liberal Commercialism Theory)

X₇ = Enduring Rivalries
Theoretical Proposition: Two states that have had recent conflicts or historical enduring rivalries are more likely to go to war. (Based in empirical fact)
**Comparative Theories:** Geller and Singer’s War-Prone Dyad Model above can be considered a *comparative theory*—meaning it can be used across a number of different case studies to find the causes of war. This means that every independent variable in the model will not necessarily apply to every case study. However, the cause of any dyadic war will be found using one or more of the independent variables noted. It is the researcher’s responsibility (through the literature search and their own data collection) to determine which of the model’s independent variables apply to their particular case study. (The official term for the concept that there is more than one path to the same dependent variable measure or condition is known as *equifinality*.)

**Writing Good Research Hypotheses**

Students sometimes struggle with writing good research hypotheses. Therefore, the following guidance is provided for those writing research hypotheses—please bear with us as some of the material we have previously covered.

Let's take this one step at a time:

Theoretical approaches (theories) are made up of *theoretical propositions* that are statements of relationships between variables.

A hypothesis takes the theoretical proposition and gives it enough specificity so that it can be tested.

A research hypothesis is always written in the same format:

**Hypothesis 1** A concise statement in one sentence of how a change or condition in one or more independent variables causes a change or condition in a dependent variable.
The **dependent variable** is always the concept you are trying to explain or predict in your research—examples, the start or avoidance of a conflict, why a foreign policy decision was made, what will a country's leaders do next month, etc.

Each theory you will learn has specific **independent variables** that it offers as the causes for the behavior or condition under study—one of your goals in reading social science literature is to identify the independent variables used in that particular study.

Some mistakes that students make in writing hypotheses:

1. The hypothesis format is not followed--it is not that hard.

2. There is a conceptual mismatch between the specific research question and the hypotheses. Remember that a hypothesis is really just one potential answer to your specific research question. Therefore, the wording of how the concepts are stated in the research question and hypotheses must be the same.

3. The hypothesis must be a stand-alone statement. Don’t assume the reader remembers the exact wording of the specific research question which may have last been stated several pages before the hypothesis.

4. There is no need to support the hypotheses with a lot of extra narrative.

I realize many of you will have problems with transitioning from thinking using the inductive approach, which uses mainly intuition to develop conclusions, to using the deductive approach, which is much more systematic (and scientific). Developing a good hypotheses is an important skill in mastering the deductive approach which is why I place so much emphasis on getting the formats correct.

Now we will write some sample hypotheses from the Nations at War theory presented above. We will use the ongoing conflict between Iran and Iraq as our case study. Note there are two acceptable procedures for writing good hypotheses; one is to include all of the pertinent independent variables in one long hypothesis statement, the second is to write one hypothesis for each independent variable. It is your choice as researcher which methods you use with a goal of making your study clear to the reader.

First example (multiple independent variables in one (long) hypothesis):

Specific Research Question: Will Iran and Iraq likely go to war?

Hypothesis 1 Iran and Iraq are likely to go to war based on their shared border (contiguity), Iran’s increase in their military capabilities (dynamic capability balance), both states not being democratic (regimes), both states not having advanced economies (economic development), and the historical enduring rivalry between the two states.
Second example (only one independent variable in each hypothesis):

Specific Research Question: Will Iran and Iraq likely go to war?

Hypothesis 1  Iran and Iraq are likely to go to war based on their shared border (contiguity).

Hypothesis 2  Iran and Iraq are likely to go to war based on Iran’s increase in their military capabilities (dynamic capability balance).

Hypothesis 3  Iran and Iraq are likely to go to war based on both states not being democratic (regimes).

Hypothesis 4  Iran and Iraq are likely to go to war based on both states not having advanced economies (economic development).

Hypothesis 5  Iran and Iraq are likely to go to war based on the historical enduring rivalry between the two states.

Note: Notice that the State Capability Balances and Alliances independent variables in the War-Prone Dyad Model are not used in this case, as the researcher has determined the other five independent variables in the model are the most compelling in predicting a future Iran and Iraq war.

Additional Help in Understanding Social Theories

Social theory is usually not a main course content issue until you reach upper-level undergraduate (300 & 400 level) and graduate courses. Most authors will not present their theories in clear structural formats as described previously in this handout. Instead, the student is often left trying to “read between the lines” as they try to determine the theoretical approach and structure of the literature they are reading. The remainder of this handout provides additional material on social theories that it is good to know in assessing the theoretical structure and claims of the literature you read. Do not feel you must master all of this material on a first reading, as the only way to truly learn and understand social theory is continued reading over many years, and maybe referring back to this handout from time-to-time to help clarify theoretical questions.

Differing Theoretical Approaches

Classifying social theories is a complex task. Below we provide an introduction to the major approaches to social theory. In an ideal world, authors would identify the theoretical approach they are using in their writings and spell out the assumptions on which they base their analyses. Seldom is this the case, so the reader is left to categorize the literature for him or herself. This introduction will allow you to generally categorize the theoretical approaches to social theory that will be encountered as you read your core, major, and elective course materials—and as you keep reading literature in the field in your future professional life.
Most Social Science textbooks classify the mainstream theories into three approaches. These approaches include: (1) realism, (2) liberalism, and (3) Marxism. These three approaches generally believe that natural science methods may be applied to the study of human behavior, and therefore social science (the combination of rationalism and empiricism) is possible. Realism, liberalism, and Marxism can all be considered part of the positivist approach to social science. These approaches differ, however, in their ontologies, or views of how the world works. Because of differing ontologies, these three theoretical approaches have widely differing assumptions. Each of these theoretical approaches has its own lineage of philosophical literature dating back hundreds, if not thousands, of years (Thucydides, Plato, Aristotle, Machiavelli, Hobbes, Marx, etc.). Below we summarize each of the three mainstream social science theoretical approaches and provide their central assumptions. This is followed by a discussion of the recent (last 20 years) post-positivist or postmodernist approach to Social Science Theory.

**Realism (Neo-Realism) – The Billiard Ball Approach**
Realists see the world as an array of self-contained states covered by hard outer shells (i.e., as billiard balls) that move around the table (i.e., frequently interacting with and forming alliances with other states) and also frequently collide with each other. Realist central assumptions include: (1) states are the principal and most important actors in the world system (i.e., state institutions and non-state actors are of secondary importance) (2) the state is a unitary actor (i.e., it has one consistent policy on key issues), (3) the state is a rational actor, and (4) national security tops the list of state international issues (i.e., military-security issues are considered high politics, while all other international issues (economics, environment, etc.) are considered low politics). State power is an important concept to realists. While there is no one agreed upon definition of power, it is generally considered as the amount of military and economic power a state possesses that can be used to influence the behavior of other states. States with more power have larger billiard balls (i.e., the United States is really a bowling ball in comparison to Barbados’ tiny marble). Balance-of-power is also an important realist concept. Significant realist literature discusses how states balance, or form alliances, against other states. Rational Choice Theory, and its sub-field of Game Theory, are used widely by realists.

Realists see the world as a “nasty and brutish” place. To realists, there is no ideal end-state for humans, just a continuing cycle of human conflict. Realists take a pragmatic approach to world problems and believe that inter-state conflict can best be reduced, for at least short periods or time, by good diplomacy that includes a combination of good governance, alliance formation (balancing-of-power) and proper application of power. Realism traces its philosophical roots to Thucydides, Machiavelli, and Hobbes. Recent notable practitioners of the realist approach include Henry Kissinger, Ronald Reagan, Margaret Thatcher, and both Bush presidencies.

**Liberalism (Pluralist, Idealist, Neo-Liberal) – The Cobweb Approach**
Liberals see the world as a mass of interlocking webs, where the nodes of the webs are both state and non-state actors and the web strands indicate the nature of the relationships or interactions between the various nodes. Liberal central assumptions include: (1) nonstate actors (i.e., international governmental organizations, nongovernmental organizations, multi-national corporations, terrorist groups, etc.) are important entities in international relations that cannot be ignored, (2) the state is not a unitary actor (i.e., the state is made up of many actors and/or institutions that do not necessarily pursue the same policy on key issues), (3) the state is not a
rational actor (i.e., state decision-making is really a complex mix of coalition and counter-coalition building, bargaining, and compromise that might not lead to an optimal decision), and (4) the agenda of politicians is extensive (i.e., it is not dominated by military-security concerns). The International Relations sub-field of International Organizations and Law, because of its core literature that stresses the importance of institutions, is largely grounded in the liberal approach. Social constructivists, an emerging segment of liberal theorists, offer that the social world is actually socially constructed by humans and their interactions. Social constructivists study how social rules, combined with material resources, explain social behavior—i.e., they look at the nature of the strands in the cobwebs. Another key segment of the liberal approach is the Democratic-Peace Theory. This theory offers that democracies do not go to war with each other, and that democracies will be internally more peaceful than other political systems. Thus, a main argument of the liberal approach is that as democracy grows in the world, the world will become more peaceful and other world problems (e.g., poverty, human rights violations, environmental degradation, etc.) will eventually be resolved. To liberals, a condition of total world peace is possible at some point in the future. Liberalism traces its roots to Plato, Aristotle, and Kant. Recent notable practitioners of the liberal approach include Jimmy Carter, Bill Clinton, and most world developed states.

Marxism (Critical Theory) – The Layer Cake Approach
Marxists see economics as the key causal mechanism for explaining social behavior. Karl Marx is the primary philosopher of this approach, with much of his material building on that of the German philosopher Hegel. To Marxists, the base, or larger bottom layer of the cake, consists of a state’s economic institutions and resources. The superstructure, or smaller second layer of the cake, constitutes a state’s political, cultural, religious, and other non-economic institutions. Marxists believe that the base, or economics, conditions all of the state’s other institutions in the superstructure. Marxist central assumptions include: (1) to understand political, economic, and social behavior, the “base” or structure of the society’s economic system must first be understood, (2) social behavior must be viewed from a historical perspective, (3) mechanisms of domination (exploitation) in a societal system must be identified, and (4) economics is the driving force of the social system. Marxists analyses focus on class-conflicts and economic exploitation. In domestic analyses of capitalist states, the principal class-conflict is between the owners of the means of production (bourgeoisie) and the workers (proletariat) who sell their labor to the bourgeoisie. By not paying the proletariat a fair market price for their labor, the bourgeoisie generate “excess value” from their capitalist enterprises which constitutes their excess profits or source of wealth. The bourgeoisie thus exploit the proletariat under the capitalist system.

International Marxists, beginning with Lenin, apply the Marist framework of class-conflict and economic exploitation to the world system. Most recently expressed in Dependency Theory and World Systems Theory, the international bourgeoisie are considered the developed states (core) and the international proletariats are considered the developing states (periphery). The international Marxists offer that the core has constructed a world economic structure (capitalism) that extracts labor and natural resources from the periphery. The core generates its excess value by exploiting the periphery, as it does not pay the periphery a fair market price for its labor and natural resources. The core is facilitated in its exploitation of the periphery by key core agents (developing state ruling elite; multi-national corporations; and international governmental
organizations like the World Trade Organization, World Bank, International Monetary Fund, etc.) that assist the core in building and strengthening the world system of economic exploitation. Marxists argue that as long as this dependent core–periphery economic structure exists, the developing states will continue to experience widespread poverty and underdevelopment. Critical Theorists work from the original tenets of Marxism, especially those relating how the ruling class exploits the workers. To Critical Theorists the ultimate conditions should be Democratic-Socialism—a combination of Democratic governing structures and Socialist economic structures.

Many thought Marxism disappeared with the collapse of the Soviet Union—this is not the case. China, Vietnam, Cuba, and North Korea still practice forms of Marxism-Leninism that the Soviets can take credit for molding into an authoritarian ruling ideology. Socialist parties that have a Marxist slant can be found throughout Europe. A large majority of developing state (Third World or Lesser Developed Country) scholars, politicians, and populaces also still embrace the Marxist view of the world, which strongly conditions their thinking and behavior. You will frequently run into works built on World Systems and Dependency theories when you read literature from scholars or policy-makers outside the United States. Additionally, many developed states (Western Europe and Scandinavian states) have adopted Marxist tenets as part of their democratic-socialist systems. Therefore, Marxism (as developed by Marx and not as manipulated by the Soviets and other authoritarian regimes) is far from dead. Marxists, like liberals, see a future ideal condition for the world. To Marxists the world will reach this ideal condition with the spread of socialism and eventual attainment of a stateless world system of communism.

Marx never really wrote much about state-on-state conflict but focused more on the internal struggle of workers (proletariat) against the oppressive owners of the means of production (bourgeoisies). Lenin took the basic tenets of Marxism and raised them to the international level. To him the world would be in a constant state of conflict as long as there was uneven development (rich and poor states). The causes of this uneven development were the rich states (especially the colonial powers) who were exploiting the poor developing states by not paying them enough for their labor or raw materials. Lenin called for an international brotherhood (Communist International) of the oppressed (developing states) to throw off the yoke of the oppressive capitalist developed states and eventually for all world states to unite in one socialist/communist system. The international conflicts started or supported by Marxist states were thus seen as both a struggle against the capitalists and as movement toward establishing the world state of socialism/communism.

Postmodernism (Post-Positivism)—The Rejectionist Approach (my words)
Rejecting the realist, liberal, and Marxist approaches to social science, a new postmodern approach to social science theory has emerged over the last 15-20 years. The postmodernists (and their cousins the post-positivists) reject social science and past research based on social science methods. Postmodernists and post-positivists reject positivist approaches as they argue that social science is not possible. Postmodernists offer that we cannot explain or predict social behavior in a larger population, but at best only “understand” human behavior in certain limited situations. Postmodernists argue that the work of scholarly social scientists is actually “social
literature,” as natural science methods cannot be used to study human behavior. Postmodernist analysis relies heavily on the intuitive analysis of the researcher. There is not a single group of postmodernists. Feminists and constructivists (not to be confused with the liberal social constructivists), among others, can all be considered part of the postmodernist movement. There are no central postmodern theoretical assumptions—in fact most postmodernists reject that developing theory is even possible. To understand human behavior, postmodernists tend to be humanists—looking within the human condition for their understandings and insights. Postmodernist research often focuses on issues of personal identity, human feelings, ideas, human perceptions, etc.—intersubjective concepts positivists have always wrestled with trying to operationalize and measure. Deconstruction, the critical analysis of positivist work, is a favorite postmodern research method used for their analyses. Feminist theorists, for example, severely criticize past male-dominated positivist theories, arguing that the world would be a better place (more peaceful and humane) if women, and not men, had originally constructed it. Constructivists, on the other hand, focus on the role of culture and identity in assessing human behavior.

**Key Issues in Social Science Theory**

There are a number of key issues that arise in the social science theoretical literature. These issues will appear frequently in the scholarly literature so it helps to have a basic understanding of each issue. They include:

**Causal Mechanisms.** Finding the causal mechanisms in our theories (i.e., in our causal models or diagrams) may be the most important objective in developing theory. Causal mechanisms normally reside below the level of the variables themselves and when uncovered provide the actual explanation for how the independent variable causes the change of condition in the dependent variable. Whenever possible, our study literature reviews should highlight the causal mechanisms at work in our causal models or diagrams. For example, arguably, the only theoretical law we have in social science is that democratic states do not go to war with each other. The causal diagram for this theoretical proposition for explaining why states go to war (or not), finds democracy as an independent variable and war as the dependent variable.

\[
\begin{align*}
X & \quad \text{both states} \\
\text{not democracies} & \quad \\
Y_{\text{war}} & \\
\end{align*}
\]

The theorized causal mechanism for this variable relationship explains that when both states are democracies, they tend to avoid war as they will view the other side as sharing similar democratic values, including the values of cooperation and compromise in resolving inter-state conflicts. Thus, the causal mechanism is not democracy (or type of government), but the societal view by both states that the crisis can be resolved through cooperation and compromise—values both states possess.

**Explaining versus Understanding.** We learned earlier that the central activity of social science was to explain (answer the why and how questions about) human behavior. Explaining is usually associated with the etic approach to research introduced above—where the researcher
stands outside the world of social practice and attempts to understand the social behavior. Some scholars (Post-Modernists, etc.) have recently downplayed the need to explain social behavior and now see their main purpose as one of understanding the behavior from the view of the humans being studied—more akin to the *emic* approach introduced above, where the researcher enters the world of social practice. Those who see their role as “understanding,” try to empathize with the humans under study and to understand reality as do their subjects.

**Historicism versus Behaviorism.** This issue first arose in the 1950s and 1960s. Before that time, most social science scholarship was based on lengthy historical analyses using historicist methodology. In these historical analyses, scholars would find broad political, economic, and social patterns they could use to describe, explain, and predict social behavior. By the 1950s and 1960s, however, the social psychology theories of Sigmund Freud were being adopted widely and computer technology was allowing social scientists to test theories using large databases—something quite difficult before when all statistical procedures were done by hand. The behaviorist approach to developing social theory, which adopted both psychological theory and quantitative methods, thus began to flourish by the late-1960s. Whether Political Scientists should be using historicist or behaviorist methods was considered one of the International Relations discipline’s great debates (Realism versus Liberalism, and now Behaviorism versus Postmodernism being the other great debates). Today, it is generally considered that both historicists and behaviorists have something important to contribute to our understanding of social behavior. Therefore, you will find both historicist and behaviorists works still being produced in social science.

**Levels of Analysis.** Social Science theory normally focuses on different levels of analysis—individual agent, groups, states (or groups within states), and international system. By studying these different levels of analysis, social scientists hope to explain and predict human behavior. Although all of the mainstream positivist approaches to social science theory presented above deal at times with all the differing levels of analysis, their work often focuses on one or two of the levels. Realists focus primarily on the international system level (explaining why the billiard balls are colliding), however, they also venture into the individual level through their use of Rational Choice Theory in Political Science. Liberals focus mainly on the state level of analysis, studying the individual institutions of state and non-state actors, while their cobweb approach is actually a model of the relationships among differing institutions. Marxists focus on both the state and international system levels, looking for the layer-cake structures that support class-conflict and economic exploitation. When scholars study one level of analysis, and then attempt to generalize to another level, a common mistake in the scholarly literature, they are said to have committed the *ecological fallacy*—i.e., their work flunks social science validity checks.

**Agent versus Structure Debate.** Social science literature is replete with arguments arising from the agent versus structure debate. The agency side of this debate argues that it is the agent, the decision-maker or group of individuals that make state decisions, which must be studied to explain a state’s behavior. Agency proponents downplay the role of structure or institutions in influencing decisions. For example, agency advocates would argue that it was Hitler alone who bears responsibility for starting World War II and not the military, economic, and ideological conditions that existed in 1930s Europe. Rational Choice Theories, along with several cognitive psychology theories, provide the agency analysis approaches. Structural
advocates, on the other hand, offer that it is the surrounding structure that conditions state behavior—that the key decision-makers are of less importance. Using the World War II example again, structuralists would argue that the rise of Hitler was secondary, that the real reason for World War II could be found in the 1930s European military, economic, and ideological context. Recognizing that most situations have both agency and structural aspects, newer versions of Rational Choice Theory are attempting to synthesize both agency and structure in its explanatory models.

**Free Will versus Determinism Debate.** This debate is similar to the agent versus structure debate. One side argues that human behavior is the result of a human’s “free will”—i.e., different humans are free to make different decisions in the same situation. The other side of the debate argues that free will is not as important a factor, but that human behavior is “determined” by the surrounding structure or institutions. As you will learn when studying social science inference in this course, social science sees the world as probabilistic. There are few, if any, deterministic laws in social science. The best we can do in our research is demonstrate the strength of relationships between variables and identify the *probabilistic* parameters that let us infer our research results to a larger population (i.e., we can quantify our sampling confidence levels and statistical inference significance levels).

**Empirical Theory versus Normative Theory.** Earlier, we learned that theory is an explanation of relationships among variables. Empirical Theory is developed using the methods of social science introduced above. To develop and test Empirical Theory we have to be able to demonstrate (observe or measure) the actual relationships among variables (i.e., the behavior under study). Normative Theory, on the other hand, offers theoretical relationships that “ought to be.” Normative Theory cannot usually be tested as the conditions needed to empirically test the theory do not exist. For example, the liberal Democratic-Peace Theory is normative as it explains that the world “ought” to be more peaceful with the spread of democracy—a condition that does not yet substantially exist so it cannot be tested. Likewise, theories derived from the Marxist approach are often normative in the sense that they offer that the human condition “ought” to be improved when socialism becomes the world system and a state of communism is reached—conditions that do not exist so they cannot be tested. Theories derived from the liberal, Marxist, and postmodern approaches are often normative as they rationalize about individual human, group, state, or international system conditions that “ought” to exist, but currently do not.

**Element: Developing Alternatives**

Good critical thinking requires the development of a range of alternative explanations, interpretations, problem solutions, question answers, etc.—this constitutes divergent thinking. Once the range of alternatives is developed the research then develops a research design to determine the best of the alternatives—which is called convergent thinking. In developing the range of alternatives, the researcher will use material from the literature search, theoretical frameworks, and by benchmarking the topic against similar cases. Brainstorming is a key component of alternative development. The researcher may also use a number of creative thinking techniques to develop alternatives not normally available through literature searching, benchmarking or brainstorming.
Brainstorming

Many important analytic projects are conducted by groups of analysts working together. Brainstorming Analysis, where a group of analysts meet and collaborate on a common problem or challenge, is a frequently used technique for stimulating new thinking.

Individual researchers can also use brainstorming to produce a wider range of ideas (i.e., use divergent thinking) than what a group might generate. Effective use of this technique by individuals requires the researcher to break free of their cognitive biases. However, a pitfall of individual brainstorming is that the individual researcher lacks the multiple perspectives that can be obtained from a group effort.

The best way to approach a group (or individual’s) brainstorming session is to develop a systematic process for its conduct. Some of the simple ground rules for brainstorming in a group, which can be modified for individual brainstorming, include:

1. Never censor ideas no matter how unconventional they might sound.
2. Instead, find out what prompted the analyst’s thought, as it might contain the seeds of an important connection between the topic and an unstated assumption.
3. Give the group plenty of time to do the brainstorming correctly. It may take an hour just to set the “rules” of the game, get the group comfortable, and exhaust the conventional wisdom on the topic. Only then will the truly creative ideas emerge.
4. Involve at least one “outsider” in the process. Look for an outsider that does not share the same educational background, culture, technical knowledge, or mindset as the core group—but make sure the outsider has some knowledge of the topic.
5. Other simple rules include: leave rank at the door, everyone in the group is an equal; do not enter the session with an official analytic line; suppress negativity and use of phrases such as “that would not work;” keep individual sessions to no more than 90 minutes (some projects may take several 90-minute sessions); and record all ideas in a visible way—use lots of note-taking.

It is often best to conduct a brainstorming effort in two phases. First, conduct a divergent thinking phase to create a wide range of ideas on the topic. Second, conduct a convergent thinking phase for a deeper investigation of the individual ideas generated in phase one. Some rules for these two phases include:

**Divergent Thinking Phase:**
- Distribute “post-it” notes and pens or markers to all participants.
- Pose the problem in terms of a “focal question” that you display on an easel or whiteboard.
- Ask the group to write down responses to the focal question and include key words from their responses on the post-it notes.
- Post all the notes on the wall for the entire group to see—treat all notes as equally important.
- When a pause follows the initial flow of ideas, this usually indicates conventional thinking has ended and the new divergent ideas should then begin to emerge.
- End this phase of the brainstorming after 2-3 pauses.
Convergent Thinking Phase:

- Ask the group to rearrange the notes on the wall according to their commonalities or similar concepts. No talking is permitted. Some notes may be moved by group members several times until they begin to cluster. Copying some notes is permitted to allow ideas to be included in more than one cluster.
- Select a word or phrase that characterizes each cluster once all the notes have been arranged.
- Identify notes that do not easily fit with others and consider them either as unusable noise or as the beginning of an idea that deserves further attention.
- Assess what the group has accomplished in terms of new ideas or concepts identified or new areas that need more work or further brainstorming.
- Instruct each participant to select (vote for) one or two areas that deserve the most attention—tabulate the votes.
- Set the group’s priorities based on the voting and decide on the next step of the analysis.

Creative Thinking Techniques for Developing Alternatives

Creative thinking entails the creation of both unique and useful alternatives. Such alternatives are then inserted in the critical thinking process for analysis with alternatives developed by other techniques. Forsett (2012) provides the basic creative thinking techniques of Fusion, SCAMPER and 5Ws + 1H as some of the most used techniques in problem solving.

Creative Thinking Principles

1. Value your ideas and believe in them.
2. There is always a new way of doing things better.
3. Failure is good and shows you the road to success.
4. Listen to valuable feedback, but ignore mindless criticism.

Use FUSION (for conceptual blending)

Level 1: Fusion with Outer Objects

1. Define your challenge (Purpose or Question).
2. Think of an outer object unrelated to your challenge.
3. Write down characteristics of the unrelated object.
4. Compare the characteristics to your challenge.

Use Fusion Level 1 for making connections between unrelated items to generate new ideas. You may have to use several unrelated objects before you create enough workable ideas to meet your challenge.
Example of Fusion Level 1

**Challenge**: Assume you run a plant that makes carpets and your business is stagnating. You want to develop some creative ideas to revitalize your business.

First, Pick a random thing or object that seems totally unrelated to your challenge. For this example we will use an elephant. So ask:

a. What does it look like?
b. What does it do?
c. Where is it found?
d. How does it function?
e. What is special about it?

Sample results of the Fusion Level 1 analysis:
1. An elephant is strong. Can you exploit the attributes of “tough” or “durable” while marketing carpets?
2. An elephant has thick skin. Can you make extra thick carpets that are super-soft to walk on?
3. An elephant has tusks. Can you make your carpets slip-resistant with tiny little barbs?
4. An elephant is the largest living animal on earth. Can you sell mega-sized carpets for a specific target group?
5. Some elephants live in rain forests. Can you create water-resistant carpets?

Level 2: Fusion of Inner Parameters

1. Define your challenge.
2. Come up with different parameters (characteristics).
3. Collect attributes for each parameter.
4. Link the attributes randomly.

Example of Fusion Level 2

**Challenge**: Assume you want to find a unique birthday gift for your best friend.

You first make a list of characteristics of your best friend (traits and interests) and characteristics of a potential gift to use in your creative thinking.
Table 8. Example of Fusion Level 2

<table>
<thead>
<tr>
<th>Friend’s Traits</th>
<th>Friend’s Interests</th>
<th>Types of Gifts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive</td>
<td>Fashion</td>
<td>Hand-Made</td>
</tr>
<tr>
<td>Athletic</td>
<td>Reading</td>
<td>Artistic</td>
</tr>
<tr>
<td>Funny</td>
<td>Cooking</td>
<td>Cheap</td>
</tr>
<tr>
<td>Honest</td>
<td>Japanese Language</td>
<td>Expensive</td>
</tr>
<tr>
<td></td>
<td>Dancing</td>
<td>Practical</td>
</tr>
<tr>
<td></td>
<td>Flowers</td>
<td></td>
</tr>
</tbody>
</table>

Then, combine different characteristics to generate ideas for a gift:
1. athletic + dancing + artistic: certificate for a 2 hour professional dance lesson or a ticket to the ballet
2. funny + fashion + hand-made: t-shirt with funny things imprinted to remind both of you of great shared memories

Use SCAMPER (put your challenge through the following questions)

- Substitute—can I replace the process, procedure, approach, product service, materials, ingredients, place, people or design?
- Combine—can I mix ideas, products, resources, materials or functions?
- Adapt—can I copy, emulate, or incorporate ideas, processes, concepts or features?
- Magnify—can I add, increase, duplicate or exaggerate the value, idea, feature, function, size or frequency?
- Put to other uses—can I use the product, service or idea for something else, for other people, other occasions, other markets, other industries or in new ways?
- Eliminate—can I divide, decrease, subtract, delete, compact or omit the process, situation, function or idea?
- Rearrange—can I change the arrangement, process, sequence, order, pace, pattern, schedule or components?

Example of SCAMPER (Substitute item only)
- Can I replace or change any of the parts of a product or service?
- Can I substitute someone who is involved in the situation?
- Can any process involved be changed or replaced?
- Can I change ingredients or materials of the product?
- Can the same product or service be provided elsewhere?
- Can I change its shape, size, color, texture, packaging or name?
- Can I change my feeling or attitudes towards it?

**Use 5W+1H** (fine-tuning technique after using FUSION, SCAMPER or both)

1. Determine your best ideas.
   a. What can we change?
   b. When will it be offered?
   c. Where will it be offered?
   d. Who will it be for?
   e. Why should we change?
   f. How will it work?

In intelligence analysis 5Ws + 1H is called Starbursting. In creative thinking this technique is used to refine the results of the FUSION and SCAMPER techniques. However, Starbursting is a very versatile technique that can be used as part of any brainstorming or other analytic effort.
Measuring Variables & Sampling

Once the researcher has completed the design of their conceptual model and/or developed a list of alternatives to test, they must develop a more detailed research design. This includes operationalizing variables (developing a measurement plan), developing a sampling plan, developing a data collection plan (if data beyond the initial literature search is needed), determining how the data will be analyzed, and finally assessing the level of bias in their research design. This section covers material on operationalizing (measuring) variables and developing sampling plans. See the earlier section on Why Critical Thinking? for details on evaluating bias in your research. The below information on Sampling Theory is also extremely useful in assessing documents or other materials found in your literature search.

Levels of Measurement.

There are four levels of measurement used in operationalizing variables. It is important to clearly understand the distinctions among these levels because each type of measurement requires its own type of statistical or comparative technique to test hypotheses.

Nominal: A nominal scale of measurement is a set of categories that vary in some quality but not in magnitude. For example, US political party would be measured on a nominal scale, with levels such as Republican, Democrat, Independent, etc. State of residence is a nominal variable, as are sex, race and religion. A special type of nominal variables is the dichotomous “dummy” variable where the existence of the concept or variable is measured as a “1” and the lack of existence is measured as a “0.” This 1/0 dichotomy is important in several quantitative and comparative procedures for testing hypotheses.

Ordinal: When values of a variable can be compared in magnitude, with different values representing different levels of magnitude. Each value is greater or less than another value. The quantitative variables that are the most crude in measurement level are measured on an ordinal scale, and are called ordinal variables. There is an ordering of the values on an ordinal scale, but the distances between the values do not have a precise numerical meaning. Examples include: upper, middle, and lower class; liberal, moderate, or conservative political attitudes; and responses to a question in the form of ‘very favorable,’ ‘favorable,’ ‘indifferent,’ ‘unfavorable,’ ‘very unfavorable.’ For these types of variables there is a clear ordering of the categories, but the absolute distances between them are unknown.

Note: Nominal and ordinal measured variables are also referred to as “categorical” variables or (incorrectly) “qualitative” variables.

Interval: In addition to incorporating orderings, interval variables have the property that there is a specific numerical distance between (and within) each pair of levels. Hence, we can compare values not only in terms of which is, say, larger than another, but also in terms of how much larger. Examples of interval variables are the population of cities and the income earned on a job.
**Ratio:** Ratio level variables have the same characteristics as interval variables, but in addition they have a set zero point. Age, temperature, miles per hour, etc., are examples of ratio variables.

Note: Interval and ratio measured variables are also referred to as “**continuous,**” “**quantitative**” or “**scale**” variables.

Arranged on a continuum from high to low—ratio, interval, ordinal, nominal—those variables with a ratio measure have the most information while those with a nominal measure have the least. You can always convert a ratio or interval variable to any of the categories below it. You cannot convert from a variable measure lower on the continuum to one higher (e.g., nominal to ordinal).

**Table 9. Summary of Variable Measurements**

<table>
<thead>
<tr>
<th>Level of Measurement</th>
<th>Place in discreet categories</th>
<th>Rank order the categories</th>
<th>Are equal intervals between and within categories</th>
<th>Set zero (0) point exists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Interval</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ordinal</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Nominal and Ordinal are considered Categorical or Qualitative variables. Interval and Ratio are considered Continuous, Quantitative, or Scale variables.

Measurement Examples:

Nominal Measure: Variable “Political Parties”—measured as Democrat, Independent, or Republican.

Ordinal Measure: Variable “Support for a Political Candidate”—measured as Low, Moderate, Strong.

Interval Measure: Variable “Temperature (in Fahrenheit)”—measured from 32 (water freezes) to 212 (water boils) (lack of set 0-point does not allow use of ratio calculations).

Ratio Measure: Variable “Temperature (in Centigrade)”—measured from 0 (water freezes) to 100 (water boils).

Note: It is extremely important to understand the different levels of variable measurement as these levels determine the type of statistical or comparative analysis procedure that you will use to test social science hypotheses.
Sampling Theory

To obtain samples which can be used to test hypotheses or for other analysis, you must consider both the size of the sample and the randomness of how the data was collected. There are two types of sampling methods—probability methods and non-probability methods. How you select a sample for your study affects the reliability and validity of your research. Normally, when researchers talk about proper sampling they are referring to quantitative studies. This handout assumes, however, that proper sampling methods apply to the full range of empirical qualitative, comparative, and quantitative research.

Figure 11. Sampling

The idea of sampling is very simple as depicted in Figure 11. You select a sample from a larger population. If you select the sample properly (i.e., obtain a representative (random) sample), you can then study the sample and infer (generalize) that the larger population will exhibit the same behaviors, relationships, opinions, etc., that you found in the sample. If you select the sample improperly, then you are unable to make accurate inferences (generalizations) back to the larger population. Inference can either be descriptive (for small numbers of cases) or statistical (for large numbers of cases).

Sampling Definitions:

Population = all the units of analysis (individuals, families, ethnic groups, states, etc.) whose behavior or relationships you want to generalize about.

Census = a list that includes every unit (case) in the population (also called a sampling frame).

N = the number of units (cases) in your sample.

Before selecting any sampling method, you must ask yourself:
What are my units of analysis and population?
How homogeneous is the population based on the individual variables I am interested in studying?
What population subgroups are important for my study (e.g., gender type, ethnic group, type employment, etc.)?

How accurate do I want my study to be (i.e., how much confidence do I want to place in my generalizations)?

How much variance is there in the individual variables that I am interested in?

How much money and time do I have to collect data from the sample?

**Probability sampling** methods are normally used in quantitative studies with large Ns. Probability sampling is based on the laws of mathematical probability. The Central Limit Theorem (CLT) tells us that if we take a sample randomly from a population, the central tendencies of individual variables in the sample (i.e., mean, mode, median, etc.) will approach the central tendencies of the same variables in the larger population. The CLT also says that the larger the sample you take, or the more samples you take from the same population, the closer the sample’s central tendencies will be to that of the population. The CLT allows us to test hypotheses within a sample and then make generalizations from the sample to the larger population. There are three main types of probability samples governed by the CLT—simple random, systematic, and stratified.

**Simple random** probability samples are the most accurate and should be used whenever possible. To take one:

You must have a numbered **sampling frame** of the entire population (i.e., census or other listing of units such as a school roster, tax roll, election roll, etc.). Note: If the sampling frame does not have sequential numbers, the researcher must create (assign) them.

Using a random number table or random number generator (see [http://http://www.random.org/](http://http://www.random.org/)) you then select which units (cases) in the sampling frame will be in your sample. Your goal is to make sure that every unit (case) in the population has an equal probability of selection as part of the sample. The equal probability of selection method (EPSM) is what you strive to ensure in all probability samples.

Rules-of-Thumb to obtain a desired **95% confidence level with a 5% confidence interval** in using representative sampling methods (simple random, systematic, and stratified):

<table>
<thead>
<tr>
<th>Number in Population</th>
<th>Number Required in Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>44</td>
</tr>
<tr>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>250</td>
<td>152</td>
</tr>
<tr>
<td>500</td>
<td>217</td>
</tr>
<tr>
<td>1000</td>
<td>278</td>
</tr>
<tr>
<td>5000</td>
<td>357</td>
</tr>
<tr>
<td>50,000</td>
<td>381</td>
</tr>
<tr>
<td>1,000,000</td>
<td>384</td>
</tr>
<tr>
<td>300 million</td>
<td>384</td>
</tr>
</tbody>
</table>
Note: As a further rule-of-thumb—large N quantitative studies of populations should shoot for a sample of **400**. To reach a 95% confidence level with a 3% confidence internal, most studies take a sample of **1,500** when researching large populations of a million or more. You may use the Sample Size Calculator at [http://www.surveysystem.com/sscalc.htm](http://www.surveysystem.com/sscalc.htm) to compute the exact sample size for any population. Note: A 95% confidence level is the norm used in most social science studies—it means we will accept being wrong 1 out of every 20 times. In medical research a 99% or even higher confidence level is usually the norm.

**Systematic** sampling is a second probability method used when you have an unnumbered sampling frame (like a phone book). For example, to take an EPSM systematic sample of a phone book:

- Determine how many pages there are in the sampling frame and how many average entries there are on each page of the sampling frame.

- Use the random number table or random number generator to select: a) a start page, b) where on the start page you will begin selecting the sample, and c) how many numbers on that page or how many pages you will skip until the next selection (depending on how many units (cases) you need in your final sample). You determine how many units (cases) you need in the final sample using the rules of thumb above.

**Warning:** **When using a stratified sample, make sure there are no recurring patterns in the sampling frame.** For example: If in the sampling frame every 15th entry was a female and your sampling strategy called for you to select every 15th person, then if you started with a female your final sample could be all females, even though the sampling frame may contain half males and half females. Check your sampling frames for such recurring patterns.

**Stratified** sampling is a third probability method used when you want to make sure sub-populations important to your study are included in the final sample. For example: If only 30% of your population is Hispanic, a stratified sample would ensure the final sample contains 30% Hispanics. To conduct a stratified sample:

- Determine the sub-populations in the population that are important to your study. Note: If you are not sure of the importance of sub-populations to your study, then use a simple random or systematic sampling method.

- Determine the proportions (percentages) of the sub-populations in your population. Divide your population into these sub-populations and then randomly sample within them (see example below). If you do not know the proportions of the sub-populations to some degree of accuracy, you cannot use stratified sampling.

Note: Using more than 2 or 3 substrates (sub-populations) can make your sampling very complex and can take time and money to complete. Also, sampling within each sub-population accounted for creates its own sampling error (which are additive), which if not accounted for in your analysis can ruin your generalizability to the population.
**Stratified Sampling Example**: Suppose that you have a population that is 50% male, 50% female, 30% Hispanic, and 70% non-Hispanic and you decide to use a stratified sampling method that gives you representative numbers of these sub-populations. Suppose your population is 1,000,000 and you want a sample size of 400. Set up a table designating your sub-populations and their proportions in the population. Cross multiply so that you obtain the proportion and number of units (cases) that need to be in each sub-population (i.e., .50 Male X .30 Hispanic = .15; take .15 X 400 = 60 Male/Hispanics in that sub-population that you want in the final sample). Then randomly sample each sub-population until you get the number desired. Remember, if there is a 5% error in the sampling of each of your sub-populations in this example, your total error could be 20%--a level not acceptable in most empirical research.

**Table 10. Stratified Sampling Example**

<table>
<thead>
<tr>
<th></th>
<th>Male (0.50)</th>
<th>Female (0.50)</th>
<th>(0.30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic (.30)</td>
<td>(.15) 60</td>
<td>(.15) 60</td>
<td>(.30) 120</td>
</tr>
<tr>
<td>Non-Hispanic (.70)</td>
<td>(.35) 140</td>
<td>(.35) 140</td>
<td>(.70) 280</td>
</tr>
<tr>
<td></td>
<td>(.50) 200</td>
<td>(.50) 200</td>
<td>400</td>
</tr>
</tbody>
</table>

**Non-probability sampling** is often used (incorrectly) in quantitative studies, however, it is more common to find non-probability methods used in qualitative and comparative studies. Non-probability methods are used when it is too cumbersome or costly to use probability methods. When using non-probability methods, you must always be aware that there will be a resultant effect on the reliability and validity of your study. The uncertainty that goes along with generalizing from a non-probability sample is one reason why you can only use qualitative and comparative studies to “advance” theories and not to “test” theories as you can do with quantitative studies. Non-probability samples are often referred to as non-representative. Unless you are very careful in using and justifying non-probability samples, others may challenge your ability to generalize to your population. This is especially true where quantitative researchers not only use a non-probability method but also disregard the rule of thumb sample sizes discussed above in their sampling.

**Cluster sampling** is a non-probability method used when there is not a convenient sampling frame. In cluster sampling, you look for natural groups or “clusters” of your units of analysis (geographic region, organizations, schools, etc.) and then use EPSMs as best you can within the clusters to select your sample. For example: if your want to sample Baptists, you would look for your sample at Baptist churches. The key with cluster sampling is to try and maximize the between group variances in your individual variables. Some Research Methods books consider cluster sampling as an acceptable probability ESPM—I don’t.

**Quota sampling** is a non-probability method that is similar to the stratified probability method. In quota sampling, instead of using the natural proportion of sub-populations in the larger population, the researcher decides the proportion (percentage) of differing sub-populations to use in the final sample. As can be imagined, unless well justified, use of quota sampling can have major reliability and validity issues.
Purposive or Judgmental sampling is a very common non-probability sampling method used in qualitative and comparative studies where descriptive (vice statistical) inference is used. In these methods, the researcher selects a sample of units or cases that provides the information needed. In other words, the researcher looks for units (cases) that serve the purpose of the study. This is also sometimes called the Expert Choice method of sampling (the expert being either the researcher or the person in the sample). You must be careful in selecting your units or cases with this method, however, to ensure that there is in fact variance in your dependent and independent variables across the cases selected.

Snowball sampling refers to a non-probability method where you build your sample by asking previous units (cases) for location data on other units (cases) that have the expertise or characteristics desired in your study. This method is especially useful when there is not a good sampling frame and where the researcher is not sure where units (cases) meeting his/her needs are located. For example: if looking for a sample of Cuban-Americans in Miami who practice the Santeria religion (where there is no sampling frame and the religion is carried out in private), the researcher could find one Santeria practitioner and then ask that person for the names of others, who could then provide the names of others, and so on—thus crating a snowballing effect.

Haphazard or Convenience non-probability sampling is the absolute last method the researcher should consider using. This method simply has the researcher selecting a sample of those units (cases) that are readily available. For example: standing in a shopping mall and asking every 10th person to complete a survey is a haphazard or convenience sample that does not adequately support generalizations to a larger population (unless your population are people in that shopping mall on that date and at that time).

There can be major problems with research reliability and validity when using any of the non-probability sampling methods. To lessen these effects when using non-probability sampling methods:

Increase the size of samples where possible.
Use triangulation of data collection methods (i.e., mix data collection methods such as a combination of interviews, focus groups, surveys, etc.).

This section is just a brief overview of the issues in proper research sampling. Not every sampling method available was discussed above. Before selecting a sampling method for your own research, you should refer to a Research Methods textbook to obtain additional details on the probability and non-probability sampling methods discussed above, in addition to those not discussed.
Element: Interpretation/Inference (Qualitative Data Analysis)

Qualitative Analysis

Qualitative analysis is empirical analysis. You use qualitative analytic methods after having gathered your data using qualitative collection methods (interviews, participant-observation, focus groups, etc.). In many ways, the process of qualitative analysis is more difficult than quantitative analysis. With quantitative analysis, there are set statistical inference procedures you use to analyze your data depending on how your variables are measured. With qualitative analysis, you use descriptive inference methods that cause the researcher to search for a useable analytic technique (tables, matrices, graphs, flow charts, etc.) to make sense of their data, while also spending considerable time and effort “becoming one” with their data. Whatever research method you use—qualitative, comparative, or quantitative—as social scientists you must remember your empirical analysis is anchored in the activities of testing hypotheses and operationalizing variables (determining the existence or degree of existence of a theoretical concept).

Qualitative studies are used primarily to develop or induce theory, to advance theory, to give voice to heretofore unknown or underrepresented segments of society, and to interpret the significance of certain social behaviors. Historians use qualitative analysis to develop “thick descriptions” or studies with deep historical detail that describe events and explain broad (macro) patterns in social behavior. Many social scientists use these historical thick descriptions as secondary data for their own studies. Anthropologists use thick description in describing different culture groups, especially if the group is one not previously studied (i.e., giving the culture voice). More often, social scientists use qualitative analysis for “descriptive inference,” which looks closer (by developing middle range theory) at explanations for social behavior and tries to relate these social behaviors to a larger population. When using descriptive inference we are normally attempting to develop, induce, or advance theory. Descriptive inference normally uses a combination of qualitative, comparative, and quantitative methods.

The goal of descriptive inference is to identify systematic factors (patterns) in qualitatively collected data (i.e., to relate social behavior patterns to a larger population using qualitative data). In conducting descriptive inference, you will also identify many non-systematic factors. While your analysis cannot ignore these non-systematic factors, you must be careful not to let the non-systematic factors cloud the overall analysis. In other words, the analyst attempts to “separate the chaff from the noise.” Qualitative analysis has a measure of uncertainty (bias), which is often large and not quantified.

Step 1 in Qualitative Analysis: Collect Your Data.

With qualitative research, you will be collecting data on limited number of cases (1-10 for qualitative studies, 11-50 for comparative studies). Your research questions, theory, causal model, hypotheses, and operationalized variables, among other factors, will determine the methods you use to collect data.
Your data may include:

- **Document or Content Analyses**
- **Primary Archive or Library Data**
- **Participant-Observation Fieldnotes**
- **Secondary Library Data**
- **Interview Tapes, Notes, and Transcripts**
- **Video or Audio Tapes/Clips**
- **Focus Group Tapes, Notes, and Transcripts**
- **Your Own Survey Data**
- **Secondary Survey Data (Gallup Polls, etc.)**
- **Newspaper/Magazine Material**
- **Photographs**
- **Secondary Statistical Reports**

Note: Refer to research methods books to determine correct procedures for collecting each of the above data. Not all data collection methods are used in every study. You may have to use different collection methods to collect data on different variables in the same study.

**Step 2 in Qualitative Analysis: Code Your Data.**

There are many ways to code your qualitative data. The most sophisticated method is to use existing coding systems such as those used by anthropologists to code cultural studies. Anthropologists devised this comprehensive coding system to allow the cross comparison of cultural systems (see research methods books for details on using these pre-designed coding systems). Qualitative analysis computer software packages such as **QSR** and **Ethnograph** are available to assist in this detailed coding of large amounts of qualitative data.

For most studies, however, simple letter, numeric, or color coding is more appropriate, especially if the study includes a limited number of variables. For example, every time a certain variable emerges in the data (based on its operational definition), a letter code (A, AB, CDW, etc.) or numeric code (1, 23, 245, etc.) could be annotated in the material’s margin or indicated for a certain counter code (for video and audio recordings). Or, every time a certain variable emerges in the data, the material could be highlighted with a different colored marker. Coding your material often takes considerable time.

Note: For most research projects, simply noting evidence on each of your study’s variables on individual note cards is probably the best method of coding. The researcher can then arrange the cards on a bulletin board or table and look for logical patterns. Once the cards are organized in a manner which supports your study’s hypothesis testing or alternative analysis, they can be organized (see next section) in the order the data will be addressed in reaching your findings.

**Step 3 in Qualitative Analysis: Organize Your Data.**

In designing a method to code your data, you must also consider how you will retrieve your codes and organize your data. This is where the qualitative computer software packages come in handy. However, you can also design a system to manually retrieve your coded data. Probably
the easiest method to retrieve your coded material manually and organize your data is by individual case study, unit of analysis, individual variable, or a combination of all three. For example, let us say we are studying school crime in four different high schools. In this case, we would be testing the same hypotheses in each of the four high schools—which are also our units of analysis. The easiest method to organize the data might be to establish four sections in a notebook—one for each of the four schools—and use a separate sheet of paper to record data for each dependent and independent variable of interest at individual schools. You would then go through your coded data and list on these sheets every instance where a particular variable of interest emerged in the data (paraphrased and annotated with the data source and page number or counter number so you can easily refer to the original data later). Once you have organized your data in this manner, you are ready to conduct your qualitative analysis.

**Step 4 in Qualitative Analysis: Conduct Your Analysis.**

After coding and organizing your data, and before conducting your actual analysis, you need to reevaluate how your individual variables are measured. Remember, our goal is to test hypotheses or determine the best alternatives and a first step in such testing is to determine how the materials are actually measured. Using the summary sheets of your data prepared in step 3 above, you should reevaluate your variable measurements as follows:

1. Some variables may have **ratio** or **interval** measures—this is especially true if the variable is measured in a survey instrument or comes from existing statistical reports (crime data, etc.).

2. Other variables may only lend themselves to **ordinal** measures—you may be able to put them in categories—i.e., low, medium, and high—but the intervals between these categories may not be equal.

3. Finally, you may only be able to categorize your variables using **nominal** measures and thus be unable to rank order them. Often, you may only be able to classify the variable as existing (yes) or not existing (no), which is referred to as a dichotomous (dummy) nominal measure.

Once you have determined how your variables are actually measured, you should subject them to **descriptive statistical analysis**—meaning to use descriptive statistics and correlation functions to first see if there are patterns in the data. At a minimum, you should determine if your variables have a central tendency (mode, median, mean), measure of dispersion or variation, and a range (low to high measures). Even nominal measured variables have a central tendency (mode or most frequent measure) and a rough range (listing of categories or behaviors). Using your variable measures and descriptive statistics analysis results, you then must devise a method—one both logical and compelling—that demonstrate how the data tests (supports or does not support) your hypotheses. The easiest way to demonstrate this test of the relationships among your variables is to use **lists of variables, tables, graphs, matrices, causal charts**, or other such vehicles to display your analysis. The purpose of these vehicles is to take a variety of disperse and seemingly unconnected data and to put it into one understandable format that demonstrates the data’s support or non-support of your hypotheses.
Pattern-Matching Analyses

Pattern-matching is probably the most common technique used in qualitative analyses. Basic narrative pattern-matching is fairly simple in that you can use most of the literary tools you learned in English Composition 101 to organize and present a variety of empirical data to show how it supports or does not support your hypotheses or alternatives analysis. Most researchers do this in a simple narrative (i.e., see Appendix 2 on using Logical Argumentation and Argument Maps).

When conducting a pattern-matching analysis, demonstrate if you can how the information meets the rules for establishing causality. Four things are required in order to establish causality.

5. **Time ordering.** The change or condition in the independent variable must always occur before the change or condition in the dependent variable.
6. **Non-spuriousness.** There cannot be a third variable that is causing both the independent and dependent variables to change.
7. **Co-variation.** We need proof that as the independent variable changes, there is a corresponding change in the dependent variable.
8. **A Theory.** Empiricism alone cannot establish causality. We need a theory (from the rationalism level) to tell us why the causal relationships exist.

When conducting a pattern-matching analysis, the following points should be kept in mind:

Organize and present your evidence and linkages in such a way that even skeptical readers will agree with your narrative analysis and findings. As a skeptical reader might do, ask yourself: How do I know that? Why should I accept that as fact? Remember the reader wants the evidence to be accurate, sufficient, representative, and precise (Booth et al, 2003, p. 146).

Make sure the Research Design and Findings sections of your paper make it clear how the data (evidence) was collected and who collected it. When using secondary data, always try to get as close to the original data collector as possible (i.e., find the original reports cited in the secondary data).

Recognize the inherent bias in your data (evidence). Remember that both with the data you collect yourself and the data others collected, there is a tendency for the original researcher to “clean the data” and make it more coherent to the reader. This “cleaning” process adds bias to the study.

There are many ways to report the data (evidence) in your narrative analysis. These include:

1. Direct quotations (but beware of overusing quotes).
2. Words representing objects, images, and events in the form of anecdotes, narratives, and descriptions (Booth et al., 2003, p. 144).
3. Tables, graphs, charts, etc.
4. Summaries and paraphrases of any of the above.
It is up to the researcher to link together the different data (evidence) and help the reader understand what it means in terms of the hypothesis being tested or alternatives being assessed.

It is permissible to use “shaky evidence” provided you notify the reader upfront of its questionable value.

As you develop the pattern-matching analysis, put yourself in the role of the skeptical reader and continually question your evidence and its validity. Don’t just accept the first data (evidence) you find as the only evidence in the case—look for corroborating evidence from other sources. The more evidence the better in convincing the biggest skeptics.

**Pros-Cons-Fixes Analyses**

Pros-Cons-Fixes analyses are most appropriate for selecting from a number of alternative problem solutions or policy decisions. It is often called the Ben Franklin Technique as Franklin wrote of how when faced with a complex decision this is the technique he followed. Table 11 provides a worksheet for conducting Pros-Cons-Fixes analysis.

For each alternative being considered, pros-cons-fixes procedures include:

- List all Pros
- List all Cons
- Review & Consolidate Cons, Merge and Eliminate
- Neutralize as Many Cons (create Fixes) as possible
- Compare Pros & unalterable Cons for all Alternatives
- Pick Best Solution

### Table 11. Pros-Cons-Fixes Worksheet

<table>
<thead>
<tr>
<th>Alternative:</th>
<th>Evaluation Factors</th>
<th>Pros</th>
<th>Cons</th>
<th>Fixes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Matrix Analyses**

A matrix analysis is a more systematic qualitative analysis method. When your study has a number of competing hypotheses/alternatives and a number of factors (variables) which can provide support (or non-support) to these hypotheses/alternatives—then a simple matrix analysis is in order. The step-by-step procedures for a matrix analysis of competing hypotheses include:

1. Identify the possible hypotheses to be considered.
2. Make a list of significant factors (evidence and arguments) for or against each hypothesis.
3. Prepare a matrix with hypotheses across the top and the factors down the left side. Under each hypothesis code (+/-/0 or C (consistent)/I (inconsistent)/ blank (neutral)) as to whether each evidence factor supports or does not support the hypothesis. Note: Other nominal, ordinal, interval or ratio measures may be used in the matrix to analyze the hypotheses/arguments.

4. Refine the matrix. Reconsider the hypotheses and delete factors that have no diagnostic value.

5. Draw tentative findings about the relative likelihood of each hypothesis. Proceed by trying to find evidence that does not support hypotheses rather than just supports them.

6. Analyze how sensitive your findings are to a few critical items of evidence. Consider the consequences for your analysis if that evidence were wrong, misleading, or subject to a different interpretation.

7. Report your findings. Discuss the relative likelihood of all hypotheses, not just the most likely one. In addition to your matrix you must provide a detailed narrative of your hypothesis and findings.

8. Identify items for future observation that may indicate events are taking a course different than expected.

Example of a matrix analysis:

Specific Research Question: (state)

Hypotheses (list/state):

H1:

H2:

H3:

<table>
<thead>
<tr>
<th>Factors (Evidence &amp; Arguments)</th>
<th>H1</th>
<th>H2</th>
<th>H3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Factor 2</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Factor 3</td>
<td>+</td>
<td>+</td>
<td>*</td>
</tr>
<tr>
<td>Factor 4</td>
<td>-</td>
<td>+</td>
<td>*</td>
</tr>
<tr>
<td>Totals</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

+ supports hypothesis, - does not support hypotheses, * no effect on hypothesis

In developing the list of factors to evaluate in a matrix analysis, the following list provides a summary of factors to consider.

- Effectiveness: seek to answer the question or solve the problem?
Efficiency:
- seek to maximize net benefits, maximize sum of customer happiness
- consider customer willingness to pay for policy alternative based upon current resources
- calculate cost effectiveness and Benefit/Cost analyses

Equity and Practicality:
- assess equity to all players (customers, clients, others, etc.)
- when faced with conflicting criteria in weighting assessment factors: let client choose
- assess legality of alternatives
- appraise political acceptability of alternatives: determine if there is too much opposition and/or too little support
- consider robustness: great in theory, but what about practice
- do you wish to maximize results according to a certain criteria, or is it more of a satisfying results you desire

Source: Modified from Bardach & Patashnik (2016)

A Qualitative Analysis Example.

The aim of this example qualitative study was to determine: Why students were afraid of being victimized at school? This was the study’s specific research question. The study was conducted in Miami-Dade County, Florida, in four public high schools (the descriptive inference was aimed at generalizing social behavior in these and other public high schools populated primarily by immigrants and native minorities in Miami-Dade County).

Based on the literature search that uncovered a similar study in New York City public high schools, the following causal diagram was derived:

This causal diagram offers that student fears of being victimized in school are a function of actual levels of school violence and school cultures of violence. A school’s culture of violence is defined as a situation where violent acts among students are accepted as part of normal social interactions among students. Evidence of a school’s culture of violence includes a school’s discourse of denial (i.e., the teachers and staff denying they had a problem), non-caring school atmosphere (where students perceive the teachers and staff care little about their personal advancement), and remiss school security forces (where school security forces not only overlook violence problems but also contribute to it through sexual harassment of students, thefts, etc.).
The literature revealed that where a school culture of violence exists, neighborhood violence is allowed to enter the school and increase the fear in students. The literature produced several hypotheses that were tested in this study:

Hypothesis 1: Schools in neighborhoods with higher violence levels contain students with higher levels of fear of victimization in school.

Hypothesis 2: Schools with higher violence levels in school contain students with higher levels of fear of victimization in school.

Hypothesis 3: Schools with cultures of violence contain students with higher levels of fear of victimization in school. Three sub-hypotheses help establish the existence of school cultures of violence and corresponding student fear levels:

Sub-Hypothesis 3a: Schools with discourses of denial about school violence are more likely to have school cultures of violence and higher student fear levels.

Sub-Hypothesis 3b: Schools with non-caring school atmospheres are more likely to have school cultures of violence and higher student fear levels.

Sub-Hypothesis 3c: Schools with remiss school security forces are more likely to have school cultures of violence and higher student fear levels.
Qualitative (and quantitative) analyses often include one or more descriptive statistics tables that help set the context for the study. In this example one table offered:

### Neighborhood and High School Demographics (Descriptive Statistics Example Table).

<table>
<thead>
<tr>
<th>Neighborhood (Note 1)</th>
<th>Northern High*</th>
<th>King High*</th>
<th>Coral High*</th>
<th>Everglades High*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>32.1%</td>
<td>84.4%</td>
<td>0.44%</td>
<td>29.0%</td>
</tr>
<tr>
<td>Hispanic**</td>
<td>23.8%</td>
<td>13.3%</td>
<td>85.6%</td>
<td>33.1%</td>
</tr>
<tr>
<td>Foreign Born</td>
<td>37.1%</td>
<td>33.7%</td>
<td>63.6%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Less Than 9th Grade Education</td>
<td>11.2%</td>
<td>29.5%</td>
<td>25.2%</td>
<td>45.3%</td>
</tr>
<tr>
<td>Below Poverty Level</td>
<td>15.4%</td>
<td>43.8%</td>
<td>14.8%</td>
<td>29.4%</td>
</tr>
<tr>
<td>Location</td>
<td>Suburban</td>
<td>Inner-City</td>
<td>Suburban</td>
<td>Rural, Suburban</td>
</tr>
<tr>
<td>High School (Note 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>64.0%</td>
<td>91.0%</td>
<td>3.0%</td>
<td>31.0%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>21.0%</td>
<td>8.0%</td>
<td>90.0%</td>
<td>48.0%</td>
</tr>
<tr>
<td>Total Student Body</td>
<td>2,588</td>
<td>2,495</td>
<td>3,558</td>
<td>1,899</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Immigrant and Native Minority Groups Studied</th>
<th>African-American, Caribbean (English-speaking), Haitian</th>
<th>African-American, Haitian</th>
<th>Cuban, Nicaraguan</th>
<th>African-American, Haitian, Mexican</th>
</tr>
</thead>
</table>

Note 1: The neighborhood data is based on the 1990 U.S. Census. Since 1990, neighborhood demographic data in each school’s neighborhood has changed and neighborhood demographics now more closely match the individual high school data.

Note 2: The high school data is based on school year 1996-1997 data provided by each school.

* Pseudonym used throughout this study.

** Hispanic is the local preference for Latin or Latino.

This was a triangulated (multi-method of data collection) study. Qualitative data collected for this study included several hundred pages of participant-observation field notes from each school; over 50 interview transcripts with teachers, school police, school administrators, and neighborhood police; four focus group transcripts conducted with students from the schools; school police crime data; neighborhood police crime data; US census data; and several local newspaper opinion polls and articles. The data was organized into four-inch thick notebooks and individual variables were color-coded using different-colored highlighter pens. Once the data was coded and the codes retrieved, the analysis revealed the following table that summarizes the hypothesis tests.
### Summary of Findings (Qualitative Research Hypothesis Test Example Table).

<table>
<thead>
<tr>
<th>Concept Evaluated</th>
<th>Northern High</th>
<th>King High</th>
<th>Coral High</th>
<th>Everglades High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Fear Levels</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Neighborhood Violence Levels (Hypothesis 1)</td>
<td>Moderate-High</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>School Violence Levels (Hypothesis 2)</td>
<td>High</td>
<td>High (Actual), (Low from official data)</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>School Culture of Violence Exists (Hypothesis 3)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Discourse of Denial Present (Sub-Hypothesis 3a)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Non-Caring Atmosphere Present (Sub-Hypothesis 3b)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Borderline</td>
</tr>
<tr>
<td>Remiss Security Forces Present (Sub-Hypothesis 3c)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The data in this study allowed ordinal measurement of the variables concerning levels of student fear, neighborhood violence, and school violence—into categories of low, moderate, and high. The existence of the variables of school cultures of violence and its three sub-parts (variables)—discourse of denial, non-caring atmosphere, and remiss security forces—were measured only in nominal dichotomous categories (existence: yes, no, or borderline/too close to call). When the example data is displayed in the above table, it reveals the data supports each of the original hypotheses. The purpose of this example study was to advance the theory that school cultures of violence contribute to student fears of victimization.

**The Key to Good Qualitative Analysis—Always Question Your Data.**

When conducting a qualitative analysis, the researcher must assume the role of a **skeptic**—always question your data. You must search for data that either supports or does not support your hypotheses. Anecdotal evidence does not count. If all you have is anecdotal evidence, then you need to mount a larger empirical data collection effort. Approach your analysis with
suspicion. Be self-critical. Be aware of your own biases you may bring to your research (the lens from the etic and emic models). Do not reject, or too easily accept, “folk-explanations” – i.e., common explanations for the behavior. Look for consistencies and inconsistencies in the data—i.e., do the non-systematic patterns that emerge really mean something? Look for negative data—i.e., evidence that does not support your hypotheses. Look at alternative explanations for the behavior—what other conclusions could be made from the same data? Always look for potential sources of bias in your research. How does your study ensure reliability and validity? Descriptive inference is based on several key assumptions—always check to make sure these assumptions have not been violated. These assumptions include:

1. The causal model is complete—i.e., no omitted or irrelevant variables are included in the model. Social science is based upon an assumption of parsimony (keeping the causal models as simple as possible); however, do not let parsimony get in the way of your designing a complete causal model.

1. Operationalized measures of variables are unbiased and efficient—i.e., measurement error is minimized.

2. Causal effects are symmetric—i.e., as independent variables move up and down, so does (do) the dependent variable(s).

3. There is no multicollinearity—i.e., there are not strong relationships (correlations) between independent variables.

4. There is no endogeneity—i.e., the dependent variable does not cause changes in any of the independent variables.

Note: Unlike quantitative analysis, there are no easy methods to test for violations of the above assumptions in qualitative analysis, or to determine the level of uncertainty (either sampling confidence level or statistical significance of variable associations) in the study’s descriptive inferences (generalizations). However, the researcher must continuously be aware of possible violations of these assumptions and the magnitude and direction of uncertainty that may be contained in your study. You would be surprised as to how often one or more of the above assumptions are violated in qualitative studies.

You should also avoid the two most common mistakes of qualitative analysis:

1. Do not become excessive or overzealous in your analysis. Often the first and simplest explanation for the social behavior under study is the best. Too much analysis could lead you to envisioning variable relationships that do not really exist.

2. Make sure you conduct an analysis. Too often, qualitative researchers become so caught up in collecting and describing their data, they forget to look for patterns and explanations for the social behavior under study.
Research & Analysis Standards

Use of the previous described elements of critical thinking provide a systematic process for conducting research and analysis. Use of the elements alone do not ensure the quality of the research and analysis or the quality of the resulting oral or written communication. Paul and Elder (2015) provide the following universal intellectual standards, which can be used as a checklist to assess the quality of the thinking and final product. Table 12 also provides a general rubric for assessing quality in research, analysis, and communications.

Universal Intellectual Standards

Use the questions after each standard to assess your research, analysis and communication.

Clarity
Could you elaborate?
Could you illustrate what you mean?
Could you give me an example?

Accuracy
How could we check on that?
How could we find out if that is true?
How could we verify or test that?

Precision
Could you be more specific?
Could you give me more details?
Could you be more exact?

Relevance
How does that relate to the problem?
How does that bear on the question?
How does that help us with the issue?

Depth
What factors make this difficult?
What are some of the complexities of this question?
What are some of the difficulties we need to deal with?

Breadth
Do we need to look at this from another perspective?
Do we need to consider another point of view?
Do we need to look at this in other ways?
Logic
Does all of this make sense together?
Does your first paragraph fit in with your last one?
Does what you say follow from the evidence?

Significance
Is this the most important problem to consider?
Is this the central idea to focus on?
Which of these facts are most important?

Fairness
Is my thinking justifiable in context?
Am I taking into account the thinking of others?
Is my purpose fair given the situation?
Am I using my concepts in keeping with educated usage, or am I distorting them to get what I want?

Additional Intellectual Standards (from Nosich, 2012)

Is the research, analysis and communication:
• Reasonable?
• Consistent?
• Falsifiable?
• Rational?
• Testable?
• Well Organized?
• Authenticated?
• Effective?
• Factual?
<table>
<thead>
<tr>
<th>Interpolation between categories may be used.</th>
<th>Advanced Thinker</th>
<th>Practicing Thinker</th>
<th>Beginning Thinker</th>
<th>Notes</th>
</tr>
</thead>
</table>
| **1. Introduction: Purpose, Goal, Question, Problem, Issue (includes the Abstract or Executive Summary)** | Paper/essay precisely focused.  
**Intellectual Standards:** Purposes, goals, questions, problems, and/or issues clearly stated, relevant, realistic and/or significant. Related purposes and questions articulated and explicitly distinguished.  
**Research Standards:** Research questions and/or Statement of the Problem properly formatted. When appropriate, clear thesis statement or findings provided. | Paper/essay somewhat focused.  
**Intellectual Standards:** Purposes, goals, questions, problems, and/or issues somewhat clearly stated, relevant, realistic and/or significant—minor problems remain. Related purposes and questions not always articulated and explicitly distinguished.  
**Research Standards:** Research questions or Statement of the Problem formatting has/have minor problems. When appropriate, thesis statement/findings not clearly stated. | Paper/essay not focused.  
**Intellectual Standards:** Purposes, goals, questions, problems, and/or issues not clearly stated, relevant, realistic and significant. Related purposes and questions not articulated and explicitly distinguished.  
**Research Standards:** Research questions or Statement of the Problem not properly formatted. When appropriate, thesis statement or findings missing. |       |
| **2. Information Literacy Skills: Information, Data, Evidence, Context** | Evident mastery of relevant information.  
**Intellectual Standards:** Data, information, and/or evidence clear, accurate, and relevant. Information both supporting and contrary to main argument, findings, or conclusions collected and understood.  
**Research Standards:** Reading, literature search and/or data collection effort sufficient to provide background, context, and/or current knowledge on issue and to answer question or problem. | Problems understanding relevant information.  
**Intellectual Standards:** Data, information, and/or evidence somewhat clear, accurate, and relevant. Information both supporting and contrary to main argument, findings, or conclusions not fully collected or understood.  
**Research Standards:** Reading, literature search and/or data collection efforts not complete and of limited use in providing background, context, and/or current knowledge on issue and in answering question or problem. | Weak understanding of relevant information.  
**Intellectual Standards:** Data, information, and/or evidence not clear, accurate, and relevant. Information both supporting and contrary to main argument, findings, or conclusions not collected and not understood.  
**Research Standards:** Reading, literature search and/or data collection efforts weak and not sufficient to provide background, context and/or current knowledge on issue and to answer question or problem. |       |
**Intellectual Standards:** Assumptions, concepts, and ideas identified, clear, and relevant. Significance of key concepts and ideas assessed. How assumptions shape point(s) of view identified and assessed. All points of view or frames of reference identified. Alternative solutions and competing points of view identified and addressed.  
**Research Standards:** Appropriate logic, reasoning, existing theories, and/or models presented. Clear list of alternatives, hypotheses, and/or evaluative criteria presented. | Limited conceptualization.  
**Intellectual Standards:** Assumptions, concepts, and ideas somewhat identified, clear, and relevant. Significance of key concepts and ideas not always assessed. How assumptions shape point(s) of view not always identified and assessed. All points of view or frames of reference not always identified. Alternative solutions and competing points of view not always identified and addressed.  
**Research Standards:** Appropriate logic, reasoning, existing theories, and/or models not always presented. Clear list of alternatives, hypotheses, and/or evaluative criteria not always presented. | Little to no conceptualization.  
**Intellectual Standards:** Assumptions, concepts, and ideas not identified, clear, and relevant. Significance of key concepts and ideas not assessed. How assumptions shape point(s) of view not identified and assessed. All points of view or frames of reference not identified. Alternative solutions and competing points of view not identified and addressed.  
**Research Standards:** Appropriate logic, reasoning, existing theories, and/or models not presented. Clear list of alternatives, hypotheses, and/or evaluative criteria not presented. |       |
<table>
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<tr>
<th>Advanced Thinker</th>
<th>Practicing Thinker</th>
<th>Beginning Thinker</th>
<th>Notes</th>
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<tr>
<td><strong>4. Analysis Skills:</strong>&lt;br&gt;<strong>Inferences, Interpretations, Implications, Consequences</strong>&lt;br&gt;Strong use of analytic methods.&lt;br&gt;<strong>Intellectual Standards:</strong> Findings and conclusions clear, accurate, and relevant. Findings and conclusions do not go beyond data, logic, or reasoning presented. Discrepancies in data reconciled. Conclusions clear as to problem solution or how key question or issue settled. Significant implications and consequences of research addressed.&lt;br&gt;<strong>Research Standards:</strong> Correct use of analytic methods evident. Reliability and validity of findings ensured.</td>
<td>Limited use of analytic methods.&lt;br&gt;<strong>Intellectual Standards:</strong> Findings and conclusions not always clear, accurate, and relevant. Findings and conclusions somewhat go beyond data, logic, or reasoning presented. Discrepancies in data not always reconciled. Conclusions not always clear as to problem solution or how key question or issue settled. Significant implications and consequences of research not fully addressed.&lt;br&gt;<strong>Research Standards:</strong> Limited or incorrect use of analytic methods. Minor problems exist with reliability and/or validity of findings.</td>
<td>Little or no analytic methods employed.&lt;br&gt;<strong>Intellectual Standards:</strong> Findings and conclusions not clear, accurate, and relevant. Findings and conclusions go beyond data, logic, or reasoning presented. Discrepancies in data not reconciled. Conclusions not always clear as to problem solution or how key question or issue settled. Significant implications and consequences of research not addressed.&lt;br&gt;<strong>Research Standards:</strong> No use of analytic methods. Primary use of opinion evident. Does not ensure reliability and validity of findings.</td>
<td></td>
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<tr>
<td><strong>5. Writing Skills</strong>&lt;br&gt;<strong>Correct formatting and writing/citation style (APA).</strong>&lt;br&gt;<strong>Research Standards:</strong> Writing is clear and concise. Proper paragraph construction and word usage demonstrated. No distracting errors in grammar, spelling, punctuation, in-text citations, or reference citations. Meets recommended page/word limits.</td>
<td>Errors in formatting and writing/citation style (APA).&lt;br&gt;<strong>Research Standards:</strong> Writing not always clear and concise. Paragraph construction and word usage exhibit problems. Several distracting errors in grammar, spelling, punctuation, in-text citations, or reference citations. Slightly less than recommended page/word limits.</td>
<td>Numerous errors in formatting and writing/citation style (APA).&lt;br&gt;<strong>Research Standards:</strong> Writing not clear and not concise. Serious problems with paragraph construction and word usage. Numerous distracting errors in grammar, spelling, punctuation, in-text citations, or reference citations. Significantly Less than recommended page/word limits.</td>
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</table>

**COMMENTS:**
References


Purdue OWL (Purdue University Online Writing Lab). (2016). *APA style*. Retrieved from

https://owl.english.purdue.edu/owl/section/2/10/


**Additional recommended reading on critical thinking, research and analysis:**


Appendix 1

A Critical Thinking Framework for Security Analysis
By Dr. Michael W. Collier

The best framework for reducing both cognitive and personal biases and improving System 2 thinking in security analysis is to combine the elements of thought and scientific method frameworks. Additionally, these two frameworks may be supplemented with other techniques found in other critical thinking frameworks. This handout synthesizes material from several frameworks to improve security analysis. Figure 1.4 provides a graphic depiction of the synthesized Security Analysis Critical Thinking Framework employed in this book. At the end of this handout is a case study of the 1962 Cuban Missile Crisis to demonstrate how the critical thinking framework may be used.

Figure 1.4 A Security Analysis Critical Thinking Framework

Figure 1.4 places the ten elements of thought in the order of the steps in the scientific method. This ordering, starting with the purpose and questions and moving clockwise around the circle, may at first seem linear as one step follows another. The proper use of the elements are anything but linear. Paul and Elder offer how in the best critical thinking efforts, the analyst will continually be reconsidering and readdressing all the elements as the overall analysis proceeds. Thus, all the elements are interrelated. Figure 1.4 shows the alternatives and context elements in an inner circle overlapping the other elements. This is because context and alternatives affect all the other elements directly. For example, an analysis may have alternative purposes and questions, alternative information, alternative points of view and assumptions, etc.—so the context and alternative elements are addressed throughout the use of each element. Additionally, Figure 1.4 shows two information elements (initial search and continuing search). This is consistent with the scientific method in depicting how the initial search will uncover the main facts and theories applying to the questions near the start of a study, but as the study continues to
develop conceptual models and alternative hypotheses, a continuing search for information is required to test those hypotheses. A more detailed coverage of the elements of thought within the Security Analysis Critical Thinking framework is provided in the following chapters. Here we will provide a short summary of each element.

**Purpose and Questions**—every research project or analysis must begin with a broad purpose. The purpose is usually so broad it cannot be studied by itself. For example, it would take years, if not decades, to study a purpose such as “How do we establish world peace?” With a general purpose established we can then develop one or more questions we can study in the time and with the resources available. For example, we may decide to study the question of “How do we establish peace in the country of Yemen?” Developing a good purpose and questions for an analytic project is not easy.

**Information and Context**—once the question(s) are developed, the next step is to search for both information (data, facts, evidence) and existing studies and theories, which may be useful in our current study. This search for information takes the form of a skill set entitled **information literacy**, meaning having the abilities to find, assess, use, and document the use of information. Elementary and secondary schools only touch on the skills needed to be information literate. During the initial information search, we also find the historical and current information needed to establish the context of the analysis. A security analyst must have well developed information literacy skills.

**Points of View and Assumptions**—with the material gleaned from the initial information search, the points of view and assumptions at work in the analyses are assessed. Points of view must be assessed for opposing actors and for the analysts themselves. Points of view really speak to the belief system of the actors or societies under study. The points of view include ideological, political, economic, social, cultural, religious, and linguistic aspects. As part of a robust assessment of points of view, the assumptions made by both the opposing actors and the analysts themselves are also teased out of collected and analyzed information. Knowing the points of view and assumptions of actors is an important part of explaining and predicting the actors’ behaviors or decision-making.

**Conceptualization**—the analyst then turns to conceptualizing (modeling) the behavior of the actors under study. There are a number of different modeling techniques. The most common modeling techniques are structural causal modeling, process modeling, and agency modeling. Other techniques such as geospatial modeling and temporal modeling, plus many others are also available to analysts.

**Alternatives**—working in conjunction with the conceptualization element, the analyst establishes the range of alternative hypotheses for the analysis, i.e., options to explain or predict the human behavior or decision-making under study. Some hypotheses will flow from the modeling in the conceptualization analysis, others will flow from a variety of other techniques, including inserting **creative thinking** into our framework, which generate those “out-of-the-box” alternatives that are both unique and useful. The creative thinking generated alternatives are then tested along with alternatives generated by the conceptualization element and other techniques.
Interpretation and Inference—with the alternative hypotheses generated, the next step is to test those hypotheses to determine the one or more best alternatives to answer the questions guiding the analysis. There are a number of qualitative and quantitative techniques for testing and evaluating hypotheses. The analytic findings emerge from this element.

Implications and Consequences—the findings or best solutions from the analysis must then be evaluated for their implications and consequences. If the findings or solutions are adopted, decision-makers need to understand the likely outcomes. Implications flow from thoughts generated by the analysis. Consequences flow from the actions the analysis identifies and decision-makers accept and implement. Usually when considering consequences they are classified in a cascading effect labeled first order, second order, and so forth.

The Security Analysis Critical Thinking Framework at Work

Box 1.1 presents a critical thinking analysis of the decision-making in the 1962 Cuban Missile Crisis. It shows the Figure 1.4 Security Analysis Critical Thinking Framework at work. While the elements in Figure 1.4 are not followed in the exact order presented above, the elements help explain the analytic process and decisions made at the highest levels of the U.S. government during the crisis.

<table>
<thead>
<tr>
<th>Box 1.1</th>
<th>Critical Thinking Analysis of the 1962 Cuban Missile Crisis Decision-Making</th>
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<tr>
<td>On the morning of October 16, 1962, U.S. President John F. Kennedy was presented proof from a high-flying U-2 photoreconnaissance airplane of the construction of offensive medium and intermediate range nuclear missile launch sites on the island of Cuba, just 90 miles from the United States. This disclosure initiated a 13 day crisis, taking the U.S. closer to nuclear war with the Soviet Union than at any other time during the Cold War. Declassified documents from both the U.S. and Soviet sides of this crisis, memoirs of those involved in the decision-making, tape recordings of U.S. meetings, and both historical and decision-making theoretical studies of the crisis, allow an in-depth analysis of the decision processes taking place in these 13 days. This short analysis looks mainly at how critical thinking by the main advisors to Kennedy played in the outcome. This military and political crisis displayed not only poor initial U.S. critical thinking, but also reveals how later good critical thinking on the U.S. side likely prevented a nuclear war.</td>
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<td>For several months prior to October 16, U.S. intelligence was monitoring the shipment of military equipment by the Soviets to the island of Cuba. The Soviets openly stated the military equipment was only defensive in nature. On September 4, President Kennedy openly warned the Soviets “Were it to be otherwise [if offensive military equipment was provided], the gravest issues would arise.” The Soviets both openly and in private contacts with U.S. officials confirmed the military equipment was solely for the defense of Cuba. Later it was found these Soviet assurances were part of a major deception campaign.</td>
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<tr>
<td>As U.S. mid-term elections approached in November 1962, Republican Party politicians excoriated the President’s Democratic Party for being soft on communism. The Republicans criticized the President for inaction in the Soviet military equipment deliveries to Cuba. Past</td>
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On the afternoon of October 16, the President took counsel with the Executive Committee of the National Security Council (ExComm), a select group of President Kennedy’s closest advisors. The discussions this first day were rife with poor thinking. The question before the ExComm was “What do we do about the Soviet missiles in Cuba?” By the end of this first day, the leading recommendations were a surprise surgical airstrike on Cuban air defenses and Soviet missile sites, followed by an invasion of Cuba. The discussions exhibited extreme Group Think (Group Conformity Bias) as the more militaristic voices in the ExComm took charge of the conversations to advocate for a military action, while others in the ExComm remained largely silent. The recommendations to the immediate problem were jumped to without sufficient information, using analogies of past Soviet military and political behavior with no supporting background or context, failure to consider a full range of alternatives, and failure to consider the immediate and longer-term consequences of such military attacks. Much of this first day’s ExComm deliberations were anchored in System 1 (fast) thinking.

After the first day of ExComm meetings, President Kennedy and his brother, Attorney General Robert F. Kennedy, were both uneasy with the recommendations to attack Cuba without first attempting diplomatic or other less risky actions. The Kennedy brothers felt they had a few days before the President must make a decision, as it appeared it would be at least a week before the information on the Soviet missiles’ existence became public, plus intelligence revealed the missile sites were likely not yet operational. Without the need for an immediate decision, the Kennedy brothers directed what can be seen now as a classic critical thinking process—a major example of System 2 (slow) thinking. First, they changed the purpose and questions of the ExComm discussions. The new purpose looked to avoid war. The main question became “How to remove the missiles in Cuba while avoiding a conventional or nuclear war?” The President knew he had to show personal decision-making strength in this case. He was also worried about how the outcome would affect Berlin. Kennedy feared the Soviets could use the Missile Crisis to militarily seize West Berlin, currently under U.S. and allied protection. The Kennedys initiated an expanded search for information by bringing into the ExComm deliberations the Department of State’s senior Soviet and Cuban specialists. They commissioned updated intelligence studies on the Soviet military aid to Cuba and on the Cuban problem. The U-2 and lower-level photoreconnaissance of Cuba was increased. The Kennedys also sought broader perspectives on the crisis by adding to the ExComm former officials from the Republican Eisenhower administration—thus having both Democratic and Republican points of view.

With a new purpose and questions, expanded information, and broader perspectives, the ExComm generated a wider range of alternatives. The main alternatives developed included:

1. Do Nothing: Assuming U.S. superiority in nuclear weapons did not result in the Cuban
missiles changing the balance of power.
2. Diplomacy 1: Use diplomatic channels to convince the Soviets to remove the missiles.
3. Diplomacy 2: Tell Fidel Castro, the Cuban leader, to break with the Soviets and not face a U.S. invasion.
4. Naval Blockade: Deploy U.S. and allied navies to prevent additional offensive military equipment from arriving in Cuba.
6. U.S. Invasion: Order a full land invasion of Cuba to destroy nuclear missile sites and eliminate the Castro Communist government.

ExComm members investigated the assumptions, consequences, and ability of the U.S. and Latin American allies to carry out each alternative. At one point, the ExComm broke into two sub-committees to consider separately the most likely alternatives (naval blockade and air strike). President Kennedy thought through the crisis using two conceptual lens. He first looked at the agency (individual leader’s decision-making) explanations for why Khrushchev would take the risk of placing missiles in Cuba and how he might react to each alternative. He tried to place himself in Khrushchev’s shoes to understand the Soviet actions. In his agency analysis he also considered the influences of the Soviet Presidium (later Politburo) on Khrushchev’s decisions. Kennedy’s second lens concerned organizational issues as he was concerned Soviet or U.S. action might be driven by poor communications or automatic institution of an organizational standard operating procedure, and not due to a leadership decision. He was very concerned of the risk of a nuclear war generated by miscalculation on one or both sides. President Kennedy did not attend all the ExComm meetings as it was felt lower-ranking officials would contribute more to meetings if he was not present. At the meetings without the President, the President’s brother was the informal facilitator. Bobby Kennedy did not generally put forward recommended alternatives of his own or relay the President’s preferences, but allowed the ExComm to progress with their own ideas. When President Kennedy attended an ExComm meeting, he asked many pointed questions to ensure he fully understood the issues at play.

President Kennedy’s final decision was a combination of the above alternatives. Taking only 3-4 days to complete their analysis, the secondary ExComm effort resulted in the President approving:

1. A naval quarantine of Cuba where all inbound offensive military weapons or equipment would be turned around and the Soviets convinced to remove the missiles from Cuba (defensive military equipment and general trade to Cuba was not interrupted). A combined U.S. and Latin American naval quarantine force was stationed 500 miles from Cuba to allow plenty of decision-making time, on both sides, if a vessel did not stop or would not turn back. The term “quarantine” was used as it seemed less threatening and more limited than “blockade.”
2. If the naval quarantine was not successful in convincing the Soviets to remove the missiles, then a strike on Cuban air defenses and Soviet missile sites would be conducted, followed by a U.S. invasion of Cuba.
President Kennedy revealed the existence of the Soviet missile sites to the U.S. public on the evening of October 22. He announced the deployment of the naval quarantine and the need for the Soviets to agree to the dismantling of the sites and their return to the Soviet Union. He first ensured he had the support of the U.S.’s closest allies and the Organization of American States before making the announcement.

During the period October 23-29, the ExComm deliberations and diplomacy continued as the U.S. bargained behind the scenes with the Soviets through letters exchanged between Kennedy and Khrushchev. There were also a number of informal communications sent for the President through other Soviet officials. A main informal communications channel entailed Bobby Kennedy meeting with the Soviet Ambassador in Washington. Later provision of Soviet records on the crisis revealed Khrushchev, while consulting with the Soviet Presidium, was making all the decisions himself with little other input. Analysis shows Khrushchev’s understanding of the situation to be cloudy at best, he worked from haphazard or incorrect information, and his decisions lacked high-quality deliberations—a classic case of System 1 (fast) thinking and why President Kennedy so feared the start of a nuclear war due to miscalculations.

In the days before and after Kennedy’s October 22 announcement, the U.S. marshalled military forces to carry out the second alternative of assaulting Cuba. Florida military airbases were filled with attack and fighter aircraft. U.S. aircraft carriers arrived on station near Cuba. U.S. Army and Marine forces were mobilized to invade Cuba through both air and amphibious assaults. Additionally, U.S. nuclear forces were place on high alert, with some targeted on Cuba, but most prepared to make a nuclear assault on the Soviet Union. The U.S. military movements and nuclear alerts were not hidden from the U.S. public or Soviet intelligence collectors.

On October 29, Khrushchev “blinked.” He offered to dismantle and return the offensive military material to the Soviet Union, including not only the nuclear ballistic missiles but also several nuclear capable short-range bombers and tactical nuclear weapons already in Cuba. Khrushchev made this offer in exchange for U.S. assurances it would not invade Cuba. Khrushchev also wanted the U.S. to remove intermediate range nuclear missiles from NATO sites in Turkey and Italy. This was not part of the public agreement, but Kennedy vowed behind the scenes to remove these now obsolete missiles within 4-5 months—which he did. Nuclear war was avoided and Kennedy was perceived as a strong leader on security as he demonstrated both backbone and keen decision-making skills. The Soviets did not assault Berlin. Kennedy’s Democratic Party retained control of both Houses of Congress in the 1962 mid-term elections. Additionally, with both sides wanting to avoid future nuclear “brinksmanship,” a Soviet-U.S. hotline to expedite crisis communications was installed and later a Soviet-U.S. nuclear test ban treaty was signed before President Kennedy’s untimely November 1963 death, the first in a number of future Soviet-U.S. arms control agreements.

Discussion Points

1. If due to time constraints, both President Kennedy and Premier Khrushchev had acted on their own or their advisors’ System 1 (Fast) intuitive thinking on October 16, what would
likely have been the immediate results and longer-term consequences?

2. Where did President Kennedy and his brother learn to structure the analytic process used after the first day by the ExComm—what we now call critical thinking?

3. What other biases do you see affected both the U.S. and Soviet deliberations in this case?

Discussion Points
1. Why did the U.S. security policy community (policy analysts and decision-makers) not take action to improve its analysis and decision-making after the September 11, 2001, disasters and Iraqi WMD NIE failure (see introduction section for background)?
2. Why have both the academic community and security analysis community (intelligence and policy analysts) resisted the use of critical thinking frameworks?
3. Briefly explain a current event, past event, or personal situation where critical thinking was not used, but should have been. What critical thinking elements were missed? What was the outcome?
4. Briefly explain a current event, past event, or personal situation where critical thinking was used. What primary critical thinking elements were used? What was the outcome?

Endnotes for Appendix 1 are at end of Appendix 2.
Appendix 2

Security Analysis: Preparing Written Reports and Verbal Briefings
By Michael W. Collier, Ph.D.

Security analysts, including both intelligence and policy analysts, prepare written reports and verbal briefings meant to both inform and persuade customers and larger audiences. There are no standard formats for these reports and briefings. There are; however, some general guidelines for preparing reports and briefings. Most intelligence reports and briefings include a title, key judgments, detailed arguments, outlooks, and implication assessments. Security policy analysis reports and briefings are similar to those in intelligence, but include recommendations and often an implementation plan for solving the problem under study. Once an initial draft of a report or briefing is completed, it then must be submitted to a review process consisting of a self-review of the critical thinking and initial draft, a structured self-critique looking deeper at the key judgments, and with intelligence reports a more formal Devil’s Advocacy challenge review.

A Different Approach

Security analysis written reports and verbal briefings likely differ from how new analysts developed such material in the past. Most people are taught in elementary school, secondary school, and even college, a general humanities writing approach to first organize and present their information as they lead the reader or listener to a final conclusion. This is not how security analysis reports and briefings are formatted. Those taught the scientific method may prepare reports with sections for a literature review, theoretical framework, research design, hypotheses tests, analysis, findings, and conclusions. This is also not how security analysis reports are formatted. Many of the skills learned from research and analysis in academic settings are important to preparing security analysis reports and briefings, especially skills in information searching, punctuation, spelling, grammar, sentence construction, and paragraph construction, but security reports and briefings are formatted differently.

Security analysis reports are similar to how journalists start written and verbal stories by addressing who, what, where, when, and how of the situation, and then later in the story present their more detailed supporting evidence and reasoning, with the most important material presented first. This journalistic formatting is due to two main factors. First, some customers will only “speed read” headlines and initial paragraphs or quickly listen to verbal story leads. Thus, the main points must be presented at the start. Busy audiences often look to snappy headlines and the first few written paragraphs or lead statements of a story to “grab” their attention and convey the gist of the story—without reading or listening to the entire story. Second, editors for both written and verbal stories cut material from the bottom-up in order to fit existing page and column constraints or time allotted for verbal stories. Similar to journalism, security analysis written reports and verbal briefings start with their findings followed by the evidence and reasoning supporting the findings.
there is no one format for developing security analysis written reports and verbal briefings. Some will be written only, some verbal only, and some will result in both written and verbal reports. Written reports range from one or two up to hundreds of pages and may be published in a variety of locations. Verbal briefings normally focus on a single customer and related audience. Live or recorded video briefings may also be posted on the Internet. Written reports and verbal briefing formats will depend on the issue or development for the analysis (i.e., the questions being answered and/or problem being addressed), the primary customer or audience for the analysis, and the style guide for their home organization. Some reports and briefings, especially tactical or current event reporting, may provide only one to three pages of written text or a few briefing slides. Other reports and briefings may take 10-20 pages of written text or 20 or so briefing slides. Still other reports and briefings may require 50-100 pages or more of written text, but still only 20 or so briefing slides, as long verbal briefings beyond 20 slides will quickly lose the audience.

The content and format for written reports and verbal briefings must be tailored for the customer and audience. Some customers or audiences may be new to the security field or specific event or development under analysis and will require more background and descriptive details. Other customers or audiences may be experienced in the security field or specific event or development under analysis and will need less descriptive details and instead desire only the analytic insights. Many large security organizations publish a formal style guide for formatting written reports. Academic programs will use one of the standard academic style manuals (American Psychological Association, Chicago, Turabian, and Modern Languages Association). Do not expect to find pre-formatted report templates (go-by’s) where the analyst just fills in the blanks. Each written report and verbal briefing is different.

The analyst’s challenge is to inform and persuade the customer and audience about the event or development under analysis. In their reports and briefings the analysts must persuade the readers or listeners of the efficacy of the analytic findings. Do not be surprised if many of the readers or listeners are initially skeptical or even hostile toward the findings. The message conveyed must be simple, concrete, and credible. Having first completed a good critical thinking analysis makes report and briefing development easier. Reports and briefings are only prepared after the critical thinking analysis is complete. As the reports and briefings are in development and review, the analyst will likely find gaps in the analysis and will have to revisit one of more of the critical thinking elements of thought. While there is no single format for preparing security analysis reports and briefings, this handout provides general guidance for their drafting. This guidance is largely standard in the security field. This handout also presents the process for conducting self-reviews, structured self-critiques, and challenge analyses before written reports and verbal briefings are published or presented to customers.
Getting Started: Title and BLUF

The first item anyone notices in a written report or verbal briefing is the title. Use the title as a “grabber” to catch the customer’s and audience’s attention from the start. The title must convey an analytic message. It should delineate the “who, what, and so what” of the written report or verbal briefing. The title must convey who the key actor(s) is/are in the analysis and an action verb to highlight the event or development addressed in the written report or verbal briefing. The action verb is usually followed by a few words to state the “so what” of the analysis. In other words, indicate why it is important the reader or listener pay attention to the written report or verbal briefing. Be as specific as possible in the title without using too many words—audiences do not like long titles. Avoid using sub-titles or supporting clauses in titles. Also remember, in some databases the title may be the main focus of key word searches, so think about how other analysts may search for and find the written reports or recorded verbal briefings. Examples of titles include:

Weak: Assessing North Korean Nuclear Weapons Developments
Better: North Korea Fields Nuclear Missiles with Reach to U.S. Pacific Coast

Weak: Colombian Cocaine Supply Increases
Better: Colombian Cocaine Production May Double Illegal Drugs Sold in the United States

At the start of the written report or verbal briefing, a contention or summary of the analytic message is provided. The contention may be a thesis, key judgments, findings, conclusions, recommendations, or a combination of these items. The contention is not the questions being answered by the analysis. It is also not the hypotheses tested in the analysis. Placing the contention at the start of the written report or verbal briefing is referred to as providing the bottom-line-up-front or BLUF. After a catchy title, the BLUF is the next item customers should see in security analysis written reports or verbal briefings. Prepare the BLUF after the main arguments supporting the contention are developed.

BLUF statements depend on the type of written report or verbal briefing and length of the analysis. In verbal briefings, the BLUF should follow directly after the title slide. In shorter written reports, the BLUF should be in the first or second paragraph and is often included as part of the introduction section. In longer written reports, the BLUF will likely be a separate initial section labeled the Executive Summary and could run a page or two in 10-20 page reports or several pages in 50-100 page or longer reports. The Executive Summary is similar to an abstract in academic writing, but with a different focus of summarizing the content of the entire report in a short space for busy customers.

Box 10.1 provides an example of a short BLUF found in the introduction to Congressional testimony by the Director of National Intelligence on the 2018 “Worldwide Threat Assessment.” Examples of longer BLUF statements, normally in Executive Summaries, may be accessed by
reviewing studies published by the U.S. Government Accountability Office\textsuperscript{7} or Congressional Research Service.\textsuperscript{8}

<table>
<thead>
<tr>
<th>Box 10.1</th>
<th>BLUF Excerpt from the ODNI 2018 “Worldwide Threat Assessment”\textsuperscript{9}</th>
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</thead>
</table>
| Competition among countries will increase in the coming year as major powers and regional aggressors exploit complex global trends while adjusting to new priorities in US foreign policy. The risk of interstate conflict, including among great powers, is higher than at any time since the end of the Cold War. The most immediate threats of regional interstate conflict in the next year come from North Korea and from Saudi, Iranian use of proxies in their rivalry. At the same time, the threat of state and non-state use of weapons of mass destruction will continue to grow….

Tension within many countries will rise, and the threat from Sunni violent extremist groups will evolve as they recoup after battlefield losses in the Middle East….

| |

Depending on the type of written report or verbal briefing, the BLUF may be supported in the same section by additional information. This is especially true in Executive Summaries. The purpose or question for the analysis is usually part of the BLUF. The BLUF should make clear if the report or briefing is in response to a specific customer request, part of other formal analytic tasking, or as the result of a current event or recent development. Audiences will sometimes wonder why the report or briefing was created. The BLUF may also be supported by important background or contextual information, especially when the background or context clarifies the linkages between the purpose of the report and contentions. Providing the basics of who, what, where, when, and how of the situation may also be appropriate in a longer BLUF. The most important factor to remember concerns how busy decision-makers may only read the BLUF. Think of the BLUF in shorter written reports as the “30-second elevator talk,” which gets the purpose, main findings, and key information across to the customer in the shortest time possible. A good BLUF will make the reader or listener want to learn more from the longer written report or verbal briefing.

**Building the Argument**

A good argument makes up the main body of a report or briefing. As with other types of academic or professional documents, drafting a security analysis written report or verbal briefing should start with an outline. The objective of the outline is to “…create a roadmap for writing [the]…paper down to the paragraph level.”\textsuperscript{10} Security analysis written reports or verbal briefings employ a top-down “pyramid” approach as depicted in Figure 10.1.\textsuperscript{11} Starting at the top of the pyramid, this approach calls first for the title and BLUF, which are followed by the argument or main body of the report providing detailed reasons and evidence supporting the BLUF.

The argument supports the contentions of the analysis. This includes the reasons and evidence supporting each **analytic finding**. The first sentence of each new argument point should be an analytic finding. Each argument point could be one paragraph or a series of
paragraphs, but all main paragraphs and supporting paragraphs should start with an analytic insight or finding. An argument is organized in priority order, with the most important analytic finding provided first, followed by the other analytic findings in descending order of importance. Objections to the analytic findings and rebuttals to those objections are also important components of the argument section.

Another recommended step in outlining a report or briefing is to create an argument map as shown in Figure 10.2. The contention or BLUF is placed at the top of an argument map. The argument map could be for the entire written report or verbal briefing, for a major report or briefing section, or even for just a single complex analytic finding, all depending on the nature of the study. Using the hierarchical structure as shown in Figure 10.2, the analytic findings supporting the contention are then presented. Figure 10.2 shows only one finding, but in cases where there are more findings (usually the case) the most important findings would be located on the far left of the argument map. Each finding is then supported with the reasons and evidence, in addition to any objections related to the specific analytic finding.

Major objections address the larger analytic results and not just objections to specific analytic findings. These normally address alternatives or recommendations not selected. These major objections must be included in the argument map and final report or briefing. This helps moderate the effects of confirmation bias where only reasons and evidence supporting pre-formed points of view may be presented while rejecting reasons and evidence contrary to these pre-formed points of view. Per Figure 10.2, the major objections are placed to the right of the findings in the hierarchical argument map. Each major objection will have its own supporting reasons and evidence. Additionally, a discussion of rebuttal reasons and evidence refuting major
objections (i.e., why the major objection was not considered further or included in the findings) must be provided. Figure 10.3 provides an example of a short argument map.
Finishing Touches

After the title, BLUF, and argument of a written report or verbal briefing comes the finishing touches, which are items complementing or enhancing the argument or main body of the report or briefing. In security analysis these finishing touches should answer questions the reader or listener may have on the BLUF and arguments. Most written reports do not require a formal conclusion as the BLUF provided at the start summarizes the results of the analysis. However, there are some items that may need to be provided later in a written report supporting the BLUF and arguments. If the project purpose or question did not specifically call for a predictive (what will happen?) analysis, in some reports and briefings it is good to include an outlook discussion highlighting what next to expect in the event or development. If a “what next” analysis was part of the BLUF and arguments, then an outlook is not required. Also, if not already addressed in the BLUF or arguments, the implications and/or consequences of the analysis concerning the contentions about the event or development may also be included near the end of a written report or verbal briefing. In a security policy analysis report or briefing, there should probably be a summary of the implementation plan for the recommendations, including any anticipated resistance to the recommendations and corresponding implementation plan.

One item that must be in all intelligence analysis reports and briefings, and may also be appropriate for security policy reports and briefings, are the analyst’s determination of the uncertainty associated with the analytic results. This uncertainty is usually expressed in terms of likelihood and confidence levels. Likelihood focuses on the likely occurrence of the explanation for an event or development, likelihood of any predictions about the event or development, or likelihood of the report’s recommendations solving the problem addressed. Confidence levels capture the analyst’s assessment of the quality of their overall analysis. In addition to the analyst’s estimates of likelihood and confidence levels, the written report or verbal briefing must indicate the causes of the uncertainty (information, sources, assumptions, models, etc.). The differences between likelihood and confidence often confuse readers or listeners. The Office of the Director of National Intelligence (ODNI) warns in order to avoid confusion, analysts “must not combine a confidence level and a degree of likelihood…in the same sentence.”13

Likelihood, which refers to the estimated actor’s past or future behaviors in an event or development, may be expressed in word statements, probabilities (either in words or numbers), or other likelihood measures such as odds (1 chance out of 5, 2 chances out of 3, etc.). The main factor in determining likelihood is the analyst’s subjective estimate of how likely the event or development being explained or predicted did or will occur. Remember when analyzing human behavior, the world is probabilistic and not deterministic. This means while a human target may have acted one way in the past, or an event or development unfolded one way in the past, does not mean the same behaviors will be identical in the future—so behavior tends to be very probabilistic. In order to standardize how likelihood and probability are expressed in Intelligence Community reports and briefings, ODNI provides the guidance summarized in Table 10.1.
Confidence levels are the analyst’s subjective assessment of the quality of their judgments. In both qualitative and quantitative analysis, the analyst must reflect on the quality of their information, sources, information gaps, assumptions, models, and analytic methods to determine their overall confidence in the report’s findings. In quantitative studies the analyst should consider in their confidence level assessment the statistical significance (p-value) of the computational results. The statistical significance is expressed as numeric probabilities (0 (least) to 1.0 (most)). In the social sciences (and security analysis), a statistical significance of .05 is normally the standard, indicating the results would be accepted, but could still be wrong in 1 out of 20 cases. This also means the results are likely correct 19 out of 20 times, or a 95% or low confidence level. In qualitative analysis, there are no statistical measures to determine confidence, so the analyst must rely on a subjective estimate. Confidence levels in both qualitative and quantitative reports are usually stated as low, moderate, or high confidence. Figure 10.4 provides the definitions of confidence levels used in the Department of Homeland Security for both quantitative and qualitative analyses.

**Table 10.1** Expressing Likelihood and Probability

<table>
<thead>
<tr>
<th>almost no chance</th>
<th>very unlikely</th>
<th>unlikely</th>
<th>roughly even chance</th>
<th>likely</th>
<th>very likely</th>
<th>almost certain(ly)</th>
</tr>
</thead>
<tbody>
<tr>
<td>remote</td>
<td>highly improbable</td>
<td>improbable (improbably)</td>
<td>roughly even odds</td>
<td>probable (probably)</td>
<td>highly probable</td>
<td>nearly certain</td>
</tr>
<tr>
<td>01-05%</td>
<td>05-20%</td>
<td>20-45%</td>
<td>45-55%</td>
<td>55-80%</td>
<td>80-95%</td>
<td>95-99%</td>
</tr>
</tbody>
</table>

Confidence levels are the analyst’s subjective assessment of the quality of their judgments. In both qualitative and quantitative analysis, the analyst must reflect on the quality of their information, sources, information gaps, assumptions, models, and analytic methods to determine their overall confidence in the report’s findings. In quantitative studies the analyst should consider in their confidence level assessment the statistical significance (p-value) of the computational results. The statistical significance is expressed as numeric probabilities (0 (least) to 1.0 (most)). In the social sciences (and security analysis), a statistical significance of .05 is normally the standard, indicating the results would be accepted, but could still be wrong in 1 out of 20 cases. This also means the results are likely correct 19 out of 20 times, or a 95% or low confidence level. In qualitative analysis, there are no statistical measures to determine confidence, so the analyst must rely on a subjective estimate. Confidence levels in both qualitative and quantitative reports are usually stated as low, moderate, or high confidence.

**Table 10.4** Department of Homeland Security Confidence Levels

**High Confidence** generally indicates that judgments are based on high-quality information from multiple sources or from a single highly reliable source, and/or that the nature of the issue makes it possible to render a solid judgment.

**Moderate Confidence** generally means that the information is credibly sourced and plausible, but can be interpreted in various ways, or is not of sufficient quality or corroborated sufficiently to warrant a higher level of confidence.

**Low Confidence** generally mean that the information’s credibility and/or plausibility is questionable, the information is too fragmented or poorly corroborated to make solid analytic inferences, or that DHS and the FBI have significant concerns or problems with sources.

Finally, security analysis written reports usually provide one or more supporting appendixes. The appendixes may include a number of different types of information, to include historical or background material, organizational information on actors in the analysis, details on information sources, worksheets or results of the analytic methodology, technical or scientific information, or any additional supporting or peripheral information the reader may use to better understand the report. Information is placed in appendixes in order to not overburden the
BLUF or argument sections of the report. Chronologies (timelines) of the event or development under study are common in appendixes. Annotated charts or maps are also common in appendixes, but annotations should only be used if they assist the reader or listener’s understanding of the analysis. Detailed statistical data presented in tables and graphs is also common in appendixes. If needed to support questions about the report or briefing, or if needed for the review process (discussed later), the analyst may include some of the worksheets employed in the analysis. This would include worksheets such as the Quality of Information Checks, 4 Ways of Seeing, Key Assumption Checks, conceptual model diagrams, or details of the analytic methods used in the analysis. In an intelligence analysis report, appendixes for the Indicators Analysis and its supporting intelligence collection plan should be included. In a security policy analysis report a detailed implementation plan is appropriate in one or more appendixes. Verbal briefings do not have appendixes, but the analyst may have additional slides available as supporting material (quasi-appendixes) in case they are needed to assist in the question and answer period. It is the analyst’s prerogative as to what goes into the appendixes, provided the information supports and helps clarify the written report or verbal briefing’s BLUF and arguments.

Hints for Preparing Written Reports

Written reports and verbal briefings must be precise, clear, accurate, consistent, digestible, and of a complexity level that does not confuse the reader or listener. The following general guidance provides hints on preparing written reports:

**Answer the Questions**—too often a security analysis project will wander off-track and fail to answer the questions asked at the analysis start. Make sure the report is consistent from the title and BLUF through the final appendix (see Figure 10.1). The report focus must remain on the original purpose and questions. The overall report must anticipate and answer the questions customers or audiences may have about the analysis. Thus, ensure the 5Ws + 1H (who, what, where, when, why, and how) questions are clearly answered. Additionally, in answering the 5Ws + 1H questions, make sure there is a focus on the “what, why now, impact so far, what next, and implications,” as appropriate for the analysis at hand. These are the pillars of what the written report must convey to customers and audiences.17

**Build Strong Paragraphs**—every paragraph in the argument should start with a first topic sentence containing an analytic insight or finding. Only one analytic insight or finding should be addressed in a single paragraph. A second strong sentence should provide context for the analytic insight or finding, elaborate on the topic sentence, or bridge the topic sentence to the remaining sentences in the paragraph.18 The remaining sentences present reasons (logic) and evidence (information, data, facts) supporting the analytic insight or finding. Ensure there are logical and easily understandable linkages between reasons and evidence that offer a smooth and consistent flow of information. Some of the common words used to link reasons and evidence building a good argument include:19

<table>
<thead>
<tr>
<th>Reason Linkage</th>
<th>Evidence Linkage</th>
</tr>
</thead>
<tbody>
<tr>
<td>as</td>
<td>as shown by</td>
</tr>
<tr>
<td>as indicated by</td>
<td>assuming (that)</td>
</tr>
<tr>
<td>because</td>
<td>due to</td>
</tr>
</tbody>
</table>
follows from  
in as much as  
may be derived from  
for  
in so far as  
may be inferred from  
from  
in view of the fact that  
since  
given (that)  
may be deduced  
the reason is that

Common words leading to findings or conclusions based on reasons and evidence include: 20

accordingly  
as a result  
conclude that  
\textit{ergo}  
for these reasons  
for this reason  
implies that  
in consequence  
is evidence that  
is reason to believe  
is reason to hold  
it follows that  
therefore  
thus  
we may infer  
which allows us to infer  
which entails that  
which implies that  
which means that  
which points to
**Display Important Evidence**—security analysis relies on qualitative or quantitative evidence, or a combination of both. Evidence may be presented in many ways:

- with direct quotations from conversations, speeches, interviews, existing reports, articles, books, and so on;
- with observations by intelligence collectors, diplomats, media personnel, and so on;
- with words representing objects, images, or events using anecdotes, narratives, or descriptions;
- with ground-truth photographs, overhead imagery, charts, maps, videos, voice recordings, communication intercepts, etc., representing objects or events visually or aurally;
- with figures, tables, diagrams, graphs, boxes, charts, or maps;
- with summaries and paraphrases of any of the above.

**Use Graphics Widely**—the old adage of “a picture is worth a thousand words” applies directly to security analysis reports. Graphics, especially figures, tables, diagrams, charts, maps, etc., may be included to support the report’s arguments or the finishing touches discussed previously. Rather than place large graphics in the main body of the report, it is usually best to place them in an appendix if they run more than a half to three-quarters of a page. Graphics alone do not tell the story. Where the graphic is placed or first mentioned in the report text, a narrative description of the graphic contents must be provided so the reader better understands the graphic contents.

**Do Not Describe the Analytic Process**—written reports present and support the analytic findings of the security analysis project. Do not give the customers a detailed description of how those findings were generated or presented. Do not use the words “bottom-line-up-front” or acronym “BLUF” as part of any report. Instead focus on the insights and findings resulting from the critical thinking analysis. Customers expect the analytic findings to result from a robust critical thinking process, but they do not need to know the details of this process. If customers want more details on how the analytic findings were generated, they will ask. There are a couple of exceptions to this hint. First, sometimes an analytic figure, graphic, table, etc., used in reaching the findings may help the audience understand the report. If one figure, graph, or table extends to more than half to three-quarters of a page, place it in an appendix, but if not it may be a candidate for placing in the report’s main body. For example, when using a matrix analysis method, such as an Analysis of Competing Hypotheses (ACH), placing the ACH matrix in the main body or in an appendix may help the customer understand the findings. Second, if the report goes through a formal review process before publication, either by supervisors or through a Devil’s Advocacy challenge process (detailed later), then it is appropriate to place the worksheets from the analytic process in appendixes or in a separate package for reviewer reference.

**Avoid Logic Fallacies**—use of logic fallacies result in defective arguments degrading the validity of the report’s analytic findings. A logic fallacy makes claims in reasoning or
evidence that do not support a valid finding or conclusion. Formal logical fallacies are usually
easy to detect as they result from untruthful information, obviously bad assumptions, or major
flaws in reasoning. Informal logic fallacies are often harder to detect. Informal logic fallacies are
widely used in societal discourse and are easily overlooked as they are so frequently used, even
by the analysts themselves. A section at the end of this handout provides a summary of
frequently encountered informal logic fallacies seen in security analysis. Analysts must ensure
the linkage of reasoning and evidence leading to an analytic findings does not commit one or
more formal or informal logic fallacies. The presence of logic fallacies reduce the validity of the
analytic findings and the veracity of the overall contentions of the analysis.

**Use Good English**—analysts must follow the grammar, spelling, punctuation, and
abbreviation guidance in their home organization’s style guide. Use of word processor spelling
and grammar checkers are highly recommended. Some common English and structural writing
mistakes to avoid in professional reports include:

- **Use Active Voice!** Security analysis written reports are written in the active voice, which
  is when the subject of the sentence performs the action of the sentence verb. Active voice
  sentences indicate the subject, verb, and then demonstrate the action is being performed
  by the subject. In passive voice the subject is usually the receiver of the action.
  Examples:
  Passive Voice (avoid): The World Trade Center was attacked by the terrorists.
  Active Voice (best): Terrorists attacked the World Trade Center.

Some word processors allow the checking of active and passive voice. It is not that all passive
voice must be avoided as an occasional passive sentence may enhance the report’s readability.
But the main narrative of a report should be primarily in the active voice.

- **Write in third person!** Avoid any use of first person (I, me, we, etc.) and second person
  (you, your) in security analysis reports and briefings. Many reports and briefings will be
  published to larger audiences where the first person or second person makes little sense.

- **Eliminate Contractions!** It is not appropriate to use contractions in formal writing. Spell
  out the words rather than employ common contractions. Example: Spell out “should not”
rather than use “shouldn’t.”

- **Avoid Expressing Opinions!** Do not include wording such as “In my opinion…..,” “I
  think…..,” I believe…..,” I feel…..,” or other similar phrases. Not only are such statements
  not in third person, but customers do not want to hear your opinions or feelings. Instead,
  they want to see analytic findings based on solid reasoning and evidence resulting from
  an active and systematic analysis. Remember: “Provide Good Analysis not Opinions!”

- **Avoid Rhetorical or Hypothetical Questions!** Rhetorical questions are used to
  emphasize a point in a narrative and are not expected to be answered. For example: “Why
  would anyone want to study security analysis?” Hypothetical questions usually point to
  important evidence or causality in an argument, but in effect the evidence and or
  causality is wrong and has no effect on the issue under study. For example: “Is it not clear
  Country Z started the war to improve its economy?” (With no evidence to support the
claim it is probably not clear.) The only questions in a security analysis should normally be those resulting from the purpose and question elements in the critical thinking process. Save the rhetorical and hypothetical questions for short stories and novels.

- **Avoid Colloquial Sayings!** Colloquial sayings are informal words, phrases, or sayings used in informal communications, but are not appropriate in professional reports or briefings. Analysts should not write the way they speak. For example, never write words such as “this study does not hold water.” Instead write “this study has problems with its reasoning and evidence.” Example two, never write words such as “President X is all bark and no bite.” Instead write “President X’s words do not lead to actions.” Do not write using informal words, phrases, or sayings.

- **Avoid Value-Laden Statements!** A value-laden statement offers the analyst’s subjective and often biased perception of a situation, which could be either good or bad. For example, never use wording such as “the United States is the most powerful nation on earth, therefore….” Customers do not want to see or hear such rah-rah! or apple-pie statements supporting an argument.

- **Provide a Readable Text!** Make sufficient use of main headings and sub-headings throughout the report to break up the text and provide the reader a logical outline of the report. The home organization’s style guide will usually provide the formatting for headings. Readers do not want to see even short two to three page written reports with only solid text. Do not use long paragraphs. Every page of the report should have at least two to three paragraph starts. Also, do not use short paragraphs. Each paragraph should have a minimum of three sentences.

- **Document Everything!** Make wide use of either bibliographic in-text citations, endnotes, footnotes, or other procedures for documenting the sources of the analysis as called for in the home organization’s style guide or by other supervisory guidance. In academic circles, not thoroughly documenting sources is plagiarism. In practitioner circles, not documenting sources is unethical, not professional, and in commercial circles might result in a lawsuit.

**Proofread, Proofread, Proofread**—even though the written report may only be in an initial draft stage at this point, it is time to start proofreading and then continue proofreading throughout the self-review, structured self-critique, and Devil’s Advocacy challenge process discussed later. Make maximum use of word processor spelling and grammar checkers. Be careful as some words will pass a spelling check because they are spelled correctly, but will not be correct for the context of the report. For example, the words “border” and “boarder” will both pass a spelling check, but mean far different things. Once an analyst has worked on a written report in a digital file format for a long time, they will often overlook simple errors because they have seen and not corrected those errors numerous times. Always get a colleague not involved in the project to proofread the report. Always print and proofread a written copy of the report as errors not readily found in a digital file format may be uncovered. Also, make at least one proofreading review where only the topic sentences of each paragraph are read to ensure the analytic findings are understandable and consistent, plus present a logical narrative from start to finish.22
Hints for Verbal Briefings

Verbal briefings offer some unique challenges. In general, all the guidance in the above hints for written reports also apply to verbal briefings. The following general guidance provides additional hints on preparing verbal briefings:

Murphy Will Be There—Murphy’s Law states “Whatever could go wrong, will go wrong.” This applies a hundred times over to verbal briefings. For example, most briefings consist of digital slides produced in MS PowerPoint or with other presentation software. If planning a digitally-supported briefing, the analyst should have a back-up plan if the computer or projector quits working (spare equipment or spare bulbs), the digital file is corrupted (have back-up copies), or other electronic problems are encountered. It is always a good idea to have paper back-ups for the customer and audience when planning digital-supported briefings. The paper copies are good as a back-up and can be handed out after the briefing to those attending. Example two, what if the briefing is scheduled for 20 minutes and the customer arrives 10 minutes late? Have a plan to reduce a 20 minute briefing to 10 minutes. It is best to think through all the problems that may be encountered in a verbal briefing and have a back-up plan for each one.

Take Pity on the Customer—the customer and audience for a verbal briefing have probably not read the corresponding written report. Always assume this is the case. Build a verbal briefing that is both informative and persuasive and does not lose the customer and audience in the process. There is an adage that the best briefings will “tell them what you are going to tell them (the BLUF), then tell them (the argument), and then tell them what you told them (the BLUF again).” This is good advice for most verbal briefings, especially where after five to seven minutes the attention of listeners will start to wane. Do not use slides (digital or paper) containing dense narratives. Use a “bullet” (short statement) format for key findings, reasoning, and evidence—the presenter can then fill in the details with their actual briefing. Use of photographs and graphics are strongly recommended, but select such material only if it directly supports reasoning and evidence in the briefing. Do not get “cute” with graphics—do not use more than three colors, avoid moving characters, and eliminate complex graphics. Make sure digital briefing slides are readable in the back of the room (use large print on slides). Spend no more than three-quarters of the time allotted giving the verbal briefing so there is time remaining for a question and answer (Q&A) period. Never go over the allotted time with the actual briefing. Time may be exceeded to extend the Q&A period provided the customer and audience agree. Remember: The goal is to inform and persuade the customer and audience and to do so in the most clear, precise, and accurate method possible. Avoid what is commonly called “Death by PowerPoint!”

Practice. Practice, Practice—do not assume the verbal briefing will exactly fill the time available. Practice the briefing and time the practice sessions to make sure it meets the allotted time. Most busy customers do not appreciate briefings running over the allotted time. Video record the initial practice sessions and also have colleagues listen to live verbal briefing practices and request they make comments on how it may be improved. When colleagues and immediate
supervisors provide critical feedback on a briefing it is often referred to in government circles as a “murder board.” Remember the 5 P’s: Prior Planning Prevents Poor Performance!

**Self-Review, Structured Self-Critique, and Devil’s Advocacy**

Review and critique of a written report or verbal briefing is critical to both its quality and effectiveness. In the active and systematic process of critical thinking there are a number of checks on the quality of the actual analysis, including assessing the quality of information, investigating potential deception, assessing points of view and assumptions, generating conceptual models, using analytic methods to reach findings, and generating implications and consequences of the findings. However, the initial draft of written reports and verbal briefings still require the analyst and supervisors to conduct a robust review and critique. Feedback from colleagues and supervisors is important.

In this handout a three-part review and critique process is recommended. First, the drafts of written reports and verbal briefings undergo a critical self-review conducted by the analyst (or analysts if a team project). Second, a deeper structured self-critique focusing on the veracity of the analytic findings is completed. Third, written reports may be submitted to a challenge analysis **Devil’s Advocacy** process. A Devil’s Advocacy challenge analysis seeks to make a case refuting the report’s findings through a review of the analytic process and by attempting to use the same evidence to reach different findings. Only after the Devil’s Advocacy process is complete should written reports be published. The Devil’s Advocacy process mainly applies to strategic or operational reports without sensitive time limits for report submission. Time-sensitive current event or tactical reports and briefings will likely only undergo the analyst’s self-review, structured self-critique, and supervisory review before publishing.

Start the self-review first with an assessment of how the report or briefing meets the requirements of the critical thinking **Intellectual Standards** detailed in Figure 10.4. The Intellectual Standards provide an initial check on both the quality of the critical thinking used in the analysis and the quality of the draft written report or verbal briefing. Both the entire draft and each major analytic finding should be placed through the Intellectual Standards’ checklist items in figure 10.4. Depending on the type of report or briefing, other standards the analyst may consider include whether the critical thinking and draft report or briefing is reasonable, consistent, falsifiable, rational, testable, well organized, authenticated, effective, or factual. As a result of the self-review, the analyst may find a need to revisit the elements of thought used to reach the analytic findings and make revisions to the initial draft.

<table>
<thead>
<tr>
<th>Figure 10.4</th>
<th>Checklist for Intellectual Standards Assessing Critical Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>_____ Clarity</td>
<td>Could you elaborate?</td>
</tr>
<tr>
<td></td>
<td>Could you illustrate what you mean?</td>
</tr>
<tr>
<td></td>
<td>Could you give me an example?</td>
</tr>
<tr>
<td>_____ Accuracy</td>
<td>How could we check on that?</td>
</tr>
<tr>
<td></td>
<td>How could we find out if that is true?</td>
</tr>
</tbody>
</table>

110
The second step is to put the draft report or briefing’s analytic findings through a more **structured self-critique.** This is a much deeper review of the analytic process used to reach the findings. The analyst most always assume the analytic findings may turn out to be spectacularly wrong. It is much better to identify why the findings are wrong before the report is published or briefing given than to have to later explain why it was wrong.\(^\text{27}\) It may take only a couple of hours to conduct a structured self-critique and identify problems early, or it could take days or weeks to later explain why the analysis was wrong to angry customers.

In a structured self-critique the analyst goes back through the entire analysis and looks deeper at the analytic process to see what factors might lead to the analytic findings being spectacularly wrong. Figure 10.5 provides a diagram of the key questions an analyst must consider to help avoid being wrong.\(^\text{28}\) The Figure 10.5 questions highlight the most common problems in
analyses turning out to be spectacularly wrong. As a result of the structured self-critique, the analyst may need to revisit the critical thinking elements of thought used to reach the analytic findings and make revisions to the latest draft.

**Figure 10.5 Structured Self-Critique Key Questions**

<table>
<thead>
<tr>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>What if my main conclusion or key judgment turns out to be spectacularly wrong?</td>
</tr>
<tr>
<td>Did I ignore contradictory evidence?</td>
</tr>
<tr>
<td>What should have the absence of information told me?</td>
</tr>
<tr>
<td>Were my key assumptions valid?</td>
</tr>
<tr>
<td>Did I avoid common analytic pitfalls?</td>
</tr>
<tr>
<td>Did deception go undetected?</td>
</tr>
<tr>
<td>How reliable was my key evidence?</td>
</tr>
</tbody>
</table>

Source: Pherson & Pherson, *Critical Thinking for Strategic Intelligence* 29

Once the structured self-critique is completed and appropriate revisions made, the analyst should feel confident in placing the revised draft of the written report into the challenge process run through either their supervisors and/or the home organization’s **Devil’s Advocacy** structure. This structure may only be a comprehensive supervisory review or a more formal Devil’s Advocacy process managed by a separate office or staff. Verbal briefings are usually reviewed only by supervisors and do not normally undergo challenge analysis. In the intelligence community, challenge analyses start with the analytic standards published by ODNI in Intelligence Community Directive (ICD) 203. 30 ICD 203 also pertains in general to security policy analysis reports and should be used as appropriate. Figure 10.6 summarizes the ICD 203 requirements.

**Figure 10.6 Checklist for ICD 203 Analytic Standards** 31

- Analysts must perform their work with objectivity and with awareness of their own assumptions and reasoning
- Analytic assessments must not be distorted by, nor shaped for, advocacy of a particular audience, agenda, or policy viewpoint
- Analysis must be disseminated in time to be actionable by customers
- Analysis should be informed by all relevant information available
Once the self-review with the Intellectual Standards, the structured self-critique, and the Devi’s Advocacy challenge process is complete, a written report should be ready for publication. Verbal briefings will also be ready for delivery upon completing the “murder boards” and supervisory reviews. This is the culmination of a security analysis project. The analyst will have taken their project from the critical thinking purpose and question elements through each critical thinking step leading to the final written report and/or verbal briefing. The critical thinking elements of thought require a more robust process of thinking and analysis than what most new analysts or academic students have experienced in the past. The more the analyst uses this analytic process, the more proficient they become. So, now is time to begin the next analytic project!

Logic Fallacies

Logic fallacies result in defective arguments.\textsuperscript{32} Formal logic fallacies result from invalid evidence, assumptions, or reasoning that do not guarantee the truth of a corresponding statement, finding, or conclusion. Formal fallacies are usually easier to identify due to the obvious false premises presented. Informal logic fallacies are often harder to identify. Informal fallacies are the result of bad reasoning leading to equally bad arguments. Many people have become desensitized to informal logic fallacies as they are rampant in human discourse and are constantly reinforced as a result of their frequent use in the news media, editorials, entertainment media, marketing and advertising, political discourse, personal conversations, and in other situations where individuals are trying to convince an audience of the correctness of their points of view, perspectives, findings, or recommendations. Avoiding both formal and informal logic fallacies is critical to ensuring valid security analysis written reports and verbal briefings.

Informal logic fallacies offering defects in the content of the reasoning evidence may be categorized into four categories: fallacies of ambiguity, fallacies of relevance, fallacies of presumptions, and fallacies of weak induction.\textsuperscript{33} Fallacies of ambiguity result in defective arguments due to problems with the linguistic structure (words or sentence structure) of a
statement. Fallacies of relevance concern cases in which the reasons given are not pertinent to the truth or falsehood of a statement. Fallacies of presumptions focus on how assumptions used in reasoning do not support the argument being made. Fallacies of weak induction result from the use of weak reasoning and poor evidence do not support the findings or conclusion. Definitions and examples of specific informal logic fallacies under these four categories are presented in this appendix.34

**Fallacies of Ambiguity**

**Equivocation**—fallacies due to changing the meaning of a word in the middle of an argument.

*Example:* Sergeant: “I am going to turn you into a responsible soldier.

Soldier: “I am already responsible. Whenever something goes wrong around here, I am always held responsible.” (Notice the different meanings of the word responsible.)

**Amphiboly**—fallacies based on loosely constructed sentences.

*Example:* “Today we will celebrate the one-hundred fiftieth anniversary of the Battle of Gettysburg in Washington D.C.” (Was the Battle of Gettysburg fought in Washington D.C., or will the celebration be held in Washington D.C.?)

**Accent**—fallacies committed due to either emphasizing certain words such that their meaning shifts (see Example 1) or a statement’s meaning is shifted by using it partly out of context (see Example 2).

*Example 1:* Soldier: “It is a general principle a soldier should seek to get all the military training and education they can. So, I do not have to go to college for an education.” (Military education and college education are not necessarily the same, but most soldiers are encouraged to seek college degrees.)

*Example 2:* Politician A: I agree with the Second Amendment to the U.S. Constitution that gives the right to citizens to bear arms, but I also support common sense gun safety laws, including restricting certain citizens (mentally ill, convicted criminals, minors, etc.) so they do not have access to guns.

Politician B: See Politician A does not support the Second Amendment. (Full context not provided of Politician A’s views on the Second Amendment.)

**Whole-to-Part (Division)**—fallacies asserting what is true of something as a whole must also be true of each of its parts.

*Example:* NATO is the most powerful defense force alliance on Earth. Estonia is a member of NATO. So, Estonia must have one of the most powerful defense forces on Earth. (Estonia is a
small European country on the Baltic bordering Russia and does not have powerful defense forces (which is why it is in the alliance).

**Part-to-Whole (Composition)**—fallacies asserting what is true of part of something must also be true of the whole thing.

*Example:* Saudi Arabia is one of the richest nations on Earth. Saudi Arabia belongs to the Arab League. So, the Arab League is made up of the richest nations on Earth. (All members of the Arab League are not rich.)

**Fallacies of Relevance**

**Appeal to Force**—fallacies resulting from an improper or inappropriate threat.

*Example:* Politician: “Country A must contribute its fair share to the security alliance. After all, they are currently allowed to be part of the alliance.” (Implied threat that Country A may be thrown out of the alliance if it does not pay its fair share.) (Draws on the emotion of being threatened if action stated or implied is not carried out—also known as blackmail.)

**Appeal to Fear**—fallacies moving a person, country, etc., to fear the consequences of not doing what the other person, country, etc., wants.

*Example:* Country: “Our security alliance must conduct a pre-emptive attack on Country Z, or other members of the alliance may be attacked soon by Country Z.” (Draws on the emotion of fear to wrongly support an argument.)

**Personal Attack (Ad Hominem Attack)**—fallacies due to attacking an opponent’s character, or their motives for believing something, instead of disproving their argument. There are three types of fallacies of personal attacks: abusive, circumstantial, and *tu quoque* (you too).

**Abusive**—fallacies where there is a direct attack on an opponent’s character.

*Example:* Politician: “The President says better relations with Country Z benefit our country. But, the President is a known liar and cheat so there is not reason to believe him.” (The Politician attacks the President’s character and not the argument of there will be benefits by improving relations with Country Z.)

**Circumstantial**—fallacies where aspects of the opponent’s circumstances are given as a reason not to support the argument.

*Example:* Politician A: “We must make use of better technology to secure our borders.” Politician B: “We cannot believe Politician A as her family owns companies that may provide and install the technology, and thus financially benefit from Politician A’s statement. So, we
cannot take her argument seriously." (The fact Politician A’s family owns technology companies does not refute her argument of how better technology would secure the borders.)

**Tu Quoque** (You Too)—fallacies due to dismissing an opponent’s viewpoint or behavior on an issue because they were inconsistent on the very same thing in the past.

Example: *Country Z invades Country A and seizes portions of Country A territory. Country Z justifies its actions as protecting Country A citizens who speak Country Z’s native language. The invasion was after Country Z previously made statements supporting the territorial integrity of Country A on numerous past occasions. Therefore, Country Z’s statements and behaviors are inconsistent and must be rejected.* (Just because a past statement or action was inconsistent with recent actions does not invalidate the current justification by Country Z—even if its recent actions are illegal, unethical, or immoral).

**Mob Appeal** (Appeal to the People)—fallacies seeking to play on people’s emotions by claiming a viewpoint is correct just because many other people agree with it.

Example: *Politician: “My opponent says we must better protect the borders as criminal gang members are entering the country illegally and committing murder, rape, and a host of other crimes. Many candidates in my opponent’s political party site these same conditions. FBI statistics though say there are only a handful of crimes conducted by criminal gang members entering the country illegally, while per-capita crime rates are much higher for native-born citizens.”* (Avoid accepting conditions or viewpoints that “many people say or know” without seeking reliable statistics concerning the conditions.)

**Pity**—fallacies resulting from urging someone to do something only because of an emotional argument stating they pity us or something associated with us, or seek pity themselves.

Example: *Recruit: “Sergeant, I tried, but I have never passed the obstacle course. If you do not pass me, I will not graduate from recruit training. My great-grandfather, grandfather, and father all served in the military with honor. If I do not pass recruit training I will disappoint my family and it will ruin my entire life.”* (The Sergeant must weigh what is legally, ethically, and morally the best decision for this recruit.)

**Accident**—fallacies where a general principle (legal, ethical, or moral) is applied in a situation where the principle does not apply.

Example: *Interrogator: “This terrorist admits he has planted a large “dirty bomb” set to explode in two days in a major city. Normal interrogration techniques have not convinced the terrorist to reveal the city and location of the bomb. Therefore, we need to immediately employ enhanced interrogration techniques, including torturing the terrorist, to hopefully save thousands of citizens.”* (What legal, ethical, or moral principles do not apply in this case?)
Stereotyping — fallacies arguing an opponent’s decisions or behaviors are based on their ideology or other traits (e.g., political views, religion, ethnic group, language, country of origin, etc.).

Example: Politician: “All communists want to overthrow democracies and destroy capitalism. Since President Z is a communist, he wants to overthrow all democracies and destroy capitalism.” (The statement “all communists want to overthrow democracies and destroy capitalism” is invalid.)

Genetic Fallacy — fallacies condemning an argument because of where it began, how it began, or who began it (type of stereotyping).

Example: Speaker: “All persons born in Country Z want that country to rule the World. My next door neighbor here in Country A was born in Country Z and has lived here 20 years. Therefore, my next door neighbor wants Country Z to rule the World.” (The statement “all persons from Country Z want that country to rule the World” is invalid.)

Straw Person (Straw Man) — fallacies distorting the opponent’s point of view or stance on an issue to make it easier to attack and disprove the opponent’s arguments — thus the attack is really on a point of view or stance that does not exist.

Example — Person A: “Increasing terrorist attacks are causing us to change our views of civil liberties such as free speech and privacy. Our country’s policies and actions should weigh slightly more on the side of improved security to keep our citizens safe, which will likely impinge on our civil liberties. Our citizens will support the slight loss of some civil liberties to gain more personal security.”

Person B: “Person A is advocating a Machiavellian approach saying the desirable ends (more security) justifies the means (impinging on civil liberties). This means in the interest of more security we will all be the subject of intrusive government surveillance and we could all be locked up in prison if the government decides to protect us.”

(Person B distorted the original argument and then provides a “worst case” scenario not related to Person A’s original statements about slight changes in civil liberties.)

Red Herring — fallacies introducing an irrelevant point into an argument. Someone may think (or want us to think) it proves their side, but it really does not. Introducing material not related to the core argument is included in this fallacy. This falacy takes its name from the British practice of dragging a bag of red herring across the trail in a fox hunt to distract the foxhounds off the actual trail of the fox. Red Herring is similar to the Straw Person fallacy.

Example: Reporter to President: “Will you start arms control talks with Country Z? President’s response: “It would be terribly presumptive for us to discuss arms control talks with Country Z when we have not yet talked to them about the issue. Most countries see arms control treaties as
one way to help reduce violence and conflict in search of peace. *I am sure Country Z has aspirations for peace like other countries.*” (The President did not answer the original question, but offered a Red Herring response on a related issue (world peace) that she probably thought did answer the question.)

**Bandwagon**—fallacies pressuring someone to do something just because many other people are doing it. This is similar to the **Mob Appeal (Appeal to the People) Fallacy**.

*Example:* Soldier: “All soldiers are reading the biography of General A. So, you should read it too if you want to be able to talk with other soldiers.” (It may not hurt to read the biography, but you could still talk with other soldiers if you did not.)

**Irrelevant Conclusion**—fallacies where conclusions are reached bearing little resemblance to the supporting argument.

*Example:* Sailor: “We have put in a lot of hard work in preparing for the upcoming shipboard inspections and operational readiness evaluations. Therefore, we are going to pass with flying colors.” (A lot of hard work does not always result in the desired outcome (but it increases the probabilities of success).)

**Repetition**—fallacies based on repeating a message loudly and very often in the hope that it will eventually be believed.

*Example:* President: “I am not a crook! I am not a crook! I am not a crook! I have never been involved in anything illegal. I am not a crook! I will repeat this statement every day until the charges against me are dropped. I am not a crook!” (Just because a message is repeated frequently does not make it true.)

**Appeal to Tradition**—fallacies resulting from encouraging someone to buy a product or do something because it is associated with something old.

*Example:* General: “We must buy the new rapid fire gatling guns because the gatling gun has been a major part of our success in every war over the last 100 years.” (Just because something worked before, does not mean it is the best choice for the future.)

**Appeal to Hi-tech (Latest Thing)**—fallacies based on urging someone to buy something because it is the “latest thing”—but not necessarily because it is the best thing.

*Example:* Admiral: “We need to procure the latest laser missile defense systems for our ships as they are the most advanced technology available.” (Just because they are the latest technology does not mean they will work better than existing missile defense systems.)
**Fallacies of Presumption**

**Circular Reasoning**—fallacies attempting to support a conclusion by simply restating it in the same or similar wording. Someone says P is true because Q is true, and Q is true because P is true.

*Example: Major:* “We know our counterinsurgency doctrine is true, because it was written by our most inspired General. And we know she is our most inspired General, because she wrote the truthful counterinsurgency doctrine. (Notice the argument both assumes and concludes the counterinsurgency doctrine is true.)*

**Complex Question (Loaded Question)—fallacies are the result of loaded questions, the answerer is put in a bad situation no matter the answer, or the answer to the presumed question is false.**

*Example 1: Politician A to Politician B: “When did you stop stealing your campaign funds?”*

*Example 2: Sergeant: “Where did you get that ridiculous idea?”  
  Soldier: “I saw it in my dreams last night.”  
  Sergeant: “So you admit it is a ridiculous idea! We need a lot less sleeping around here.”*

(Example 1 assumes Politician B is stealing campaign funds. Example 2 assumes it is a ridiculous idea. Neither of these assumptions may be true.)

**Suppressed Evidence**—fallacies resulting from withholding relevant evidence.

*Example: Politician: “If we want to get rid of chemical weapons, just take them to a barren desert and bury them. There will be no biological weapons after that.” (These statements suppress the relevant evidence on the effects of burying chemical weapons on the desert ecosystem and the ability to produce more chemical weapons.)*

**Either-Or (False Dichotomy)—fallacies asserting that we must chose between only two things, when in fact there are a number of different alternatives we could chose.**

*Example: General to President: “We either need to conduct a full-on military assault or do nothing in reaction to Country Z’s aggressive actions.” (Statement does not consider diplomatic or lesser military options.)*

**Fallacies of Weak Induction**

**Appeal to Authority (or Illegitimate Authority)—fallacies due to appeals to the authority of someone who has no special knowledge in the area they are discussing or due to tradition or rumors.**
Example 1: Politician: “We must invade Country Z because Singer A, the most famous singer in the world, says we should.” (Singer A is outside their area of expertise.)

Example 2: Voter: “I must vote for all candidates from Political Party A because my family has voted for all candidates from this party over the past five decades.” (Play to tradition.)

Example 3: Voter: “Politician A reported many studies (no specifics) show his foreign policy agenda is the best.” (Rumors based on exactly what studies say—or if they even exist.)

**Proof by Lack of Evidence (Appeal to Ignorance)**—fallacies claiming something is true simply because nobody has yet given any evidence to the contrary.

Example: General: “Country Z must have laser weapons as we have seen no evidence such weapons are located in Country Z.” (If there is no evidence whether a statement is true or false, it is best to suspend judgment regarding its truth.)

**Hasty Generalization**—fallacies using a very limited sample to generalize to a larger group or set of actions. Similar to the **Part-to-Whole Fallacy**.

Example: Admiral: “The shipboard surface-to-air missle test failed to destroy an inbound enemy aircraft, so we must remove all of these missles from the fleet.” (Just because one missle failed does not mean they will all fail—more testing is needed.)

**False Cause**—fallacies due to a result of a false causal claim. Some false causal claims are due to myths and superstitions.

Example: Petty Officer: “Nautical superstitions say to never whistle on a ship, as whistling aboard ship will bring strong winds placing the ship and crew in danger. One of our new sailors whistles onboard all the time. Sure enough, on our next voyage we ran smack into a hurricane.” (Science cannot prove whistling will generate a hurricane.)

**Slippery Slope**—fallacies asserting if one thing happens that one or more other things will follow, when in fact there is no evidence to support the follow-on actions.

Example: Containment of the spread of Communist Soviet Union influence was a major part of U.S. strategy in the Cold War. The Domino Theory was part of this strategy as it offered: “if one country fell to Communism, then another would fall, then another and another, just like a line of dominoes would fall in sequence if lined up in a row.” Domino Theory was seldom questioned. It was a classic example of a slippery slope argument as there was no causal basis supporting this theory. In fact, whether a country fell to communism was related to its internal political, economic, and social conditions, and had little to do with domino-like forces pushing one country over after another. (This is another case related to the **False Cause Fallacy**.)
**Weak Analogy**—fallacies claiming that some items which have only a few minor similarities are practically the same in almost everything else. (Why analysis using analogies is not recommended.)

*Example: Politician: “The U.S. Military Academy (West Point) and U.S. Naval Academy (Annapolis) should merge into one institution as they both graduate future military leaders.”*  
(Other than both graduating future military leaders, the two academies are very dissimilar in terms of their curriculums, service customs used to socialize cadets, and the focus of preparing graduates for future careers—one produces U.S. Army soldiers, the other U.S. Navy sailors and aviators.)

**Post hoc ergo propter hoc**—fallacies stating since A happened before B, A must have caused B. This is similar to the False Cause Fallacy.

*Example: Politician: “Our political party was born over 100 years ago. Last year we won a war while our political party controlled the executive and legislative branches of government. Therefore, the formation of our political party caused us to win the war.”*  
(There are a number of other factors other than political party influencing the outcome of a war. Remember: Correlation does not mean Causation.)

**Exigency**—fallacies offering nothing more than a time limit as a reason for us to do what someone wants.

*Example: Politician: “We need to pass the defense budget with the new shipbuilding authorizations by tomorrow or we may not get to it for months, since we have summer recess and national elections coming up next.”*  
(Shipbuilding plans take years to create and even longer for construction—a few months delay is not much in the larger scheme.)

**Leap of Faith**—fallacies asserting a causal linkage or condition exists with no good supporting reasons or evidence.

*Example: Analyst: “We estimate that terrorist group A will soon attack our country.*

  *Customer: “What are your reasons and evidence for that finding?”*

  *Analyst: “Despite the terrorist group has never stated it would attack our country, it does not have the capabilities or logistic support to do so, and has never attacked us before, we estimate since they have attacked our allies interests before, they will soon attack us, even though we are 4,000 miles away from their normal operating area. They must be planning attacks on our country.”*  
  (More evidence and reasoning is needed to declare a threat than just that it exists in a distant region or may have done so in the distant past.)
Appendix 1 and 2 Endnotes

1 Paul and Elder, 96-97.
2 The Cuban Missile Crisis is one of the most studied cases in recent history. The Box 1.1 analysis is a synthesis of several works on this crisis. The main material for this case study comes from Richard E. Neustadt and Ernest R. May, *Thinking in Time, The Uses of History for Decision Makers* (New York: The Free Press, 1986) chap. 1. David T. Moore, *Critical Thinking and Intelligence Analysis* (Washington, DC: National Defense Intelligence Press, 2009), 20-47, provides a critical thinking analysis of the U.S. intelligence community analytic process during the crisis. The best theoretical coverage of the case may be found in Graham Allison and Philip Zelikow, *Essence of Decision, Explaining the Cuban Missile Crisis*, 2nd ed. (New York: Longman, 1999). Also helpful was Robert Smith Thompson, *The Missiles of October, The Declassified Story of John F. Kennedy and the Cuban Missile Crisis* (New York, Simon and Schuster, 1992), which uses declassified U.S. and Soviet material and recreates the dialog and personal interactions among ExComm members and other key personnel during the 13 day crisis.
5 Ibid, 251.
10 Kaiser and Pherson, 22.
11 Modified from Kaiser and Pherson, 23.
14 Ibid.
15 Reprinted with U.S. government permission in Pherson and Pherson, 220.
16 Kaiser and Pherson, 57-58
18 Ibid, 39.
22 Kaiser and Pherson, 71.
26 Paul and Elder, 141-142.
27 Pherson and Pherson, 196-199.
28 A more in-depth list of structured self-critique questions is available in Pherson and Pherson, 198. The structured self-critique technique is defined in more detail in Heuer and Pherson, 245-249.
29 Pherson and Pherson, 199.
30 Office of the Director of National Intelligence, 2-5.
31 Ibid.
33 Hendrickson et al., 111.
34 All examples prepared by the author, often modified from examples in Hendrickson et al. and Bluedorn and Bluedorn.