Eastern Kentucky University  
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Homeland Security Program

Security Research and Analysis:  
A Critical Thinking Approach

An Unpublished Manuscript

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Welcome to your course!

This manuscript covers aspects of security research and analysis and is used as a supplemental text in several of your Homeland Security Program courses. Your course may include a focus on critical problem analysis, policy and legal analysis, intelligence analysis, risk analysis or other areas where you will be required to research, analyze and prepare a variety of oral and/or written products. This manuscript provides the basics of security research and analysis you will need in your upper-division and graduate courses, in addition to skills needed in your professional careers. In your other Homeland Security courses there will be additional research and analytic methods and procedures introduced that build on the basics in this manuscript.

The skills required to conduct scientific research are the most in-depth of the many types of research and analysis you will experience in your professional careers. This manuscript focuses mainly on social science research methods and procedures—skills you can then adapt and use in other types of academic and professional research projects.

This manuscript varies somewhat from mainstream social science research methods material by adopting a framework for research, analysis and writing/presenting using 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 careers in Homeland Security.

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 research and analysis skills you will experience cognitive dissonance—meaning as you learn new definitions and procedures for your research and analysis it will conflict with what you have learned in your previous education and result in a level of “mental anguish.” In the process of working out this mental distress 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 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 in the security community demands the professional fields adapt the new methods covered in this manuscript and your other Homeland Security courses. The purpose of this section is to present some of the most important vocabulary (definitions and concepts) you will use in security research in both your academic 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>Reasoning Definition</th>
<th>Research Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Induction</strong></td>
<td>Reasoning that leads to findings/conclusions based in probability (likely, probable, etc.).</td>
</tr>
<tr>
<td></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.</td>
</tr>
<tr>
<td><strong>Deduction</strong></td>
<td>Reasoning that leads to findings/conclusions considered not refutable (i.e., the truth).</td>
</tr>
<tr>
<td></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.</td>
</tr>
</tbody>
</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 or process step contents.

*Internal Validity.* Means that you have a properly specified causal or process 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 all your Homeland Security research and analysis.

Types of Research Studies

There are generally three types of studies you will encounter in the social science research world. Security 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 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 causal structural 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 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 the 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. As with Policy Analysis, the researcher must be proficient in the skills of Social Science Research to conduct good Evaluation Research.
Table 2. Comparing Differing Purposes of Research and Analysis

<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>
</thead>
<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: Exploratory 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)</td>
<td>(Implied Literature Search, includes benchmarking from past evaluations)</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)</td>
<td>(Implied data collection)</td>
<td>(Implied data collection)</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>
</tbody>
</table>
Selecting a Research Design 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>
</thead>
<tbody>
<tr>
<td>Identify Broad Patterns</td>
<td>S</td>
<td></td>
<td>P</td>
</tr>
<tr>
<td>Test/Refine Theory</td>
<td>S</td>
<td>S</td>
<td>S</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></td>
</tr>
<tr>
<td>Explore Diversity</td>
<td>S</td>
<td>P</td>
<td>S</td>
</tr>
<tr>
<td>Give Voice</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P = Primary Use, S = Secondary Use
Source: Ragin (1994).

Figure 1. Cases, Aspects of Cases, and Research Design Strategies

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. (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 a Comparatist in Political Scientist (in the U.S.), it 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 looks for 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 “proved” or “disproved.” No matter how strong your
correlations (co-variations) you can only “support/accept” or “not support/reject” a hypothesis.

A Critical Thinking Framework

EKU has adopted 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* is more general in nature and provides a framework that can be used in both your professional and personal lives for planning, problem-solving and decision-making. The basic structure of the *Foundation for Critical Thinking* framework is depicted in Figure 2.

**Figure 2. Foundation for Critical Thinking Framework (Paul and Elder, 2014)**

Nosich (2012), also with the *Foundation for Critical Thinking*, has added two additional elements to Figure 2—**Context** and **Alternatives**. When conducting security 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 1 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.

**Figure 3. Social Science Research Critical Thinking Framework**
**Why Critical Thinking?**

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 a later section in 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 thinking “habits” causing a number of cognitive biases leading to degraded thinking. The need for you to master critical thinking skills in your research and analysis 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 disasters 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>
</tr>
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<tbody>
<tr>
<td><strong>Fast</strong></td>
<td>Effortless</td>
<td>Slow</td>
</tr>
<tr>
<td><strong>Effortless</strong></td>
<td>Triggers emotions</td>
<td><strong>Logical</strong></td>
</tr>
<tr>
<td><strong>Unconscious</strong></td>
<td>Looks for patterns</td>
<td><strong>Conscious</strong></td>
</tr>
<tr>
<td><strong>Associative</strong></td>
<td>Creates stories to explain events</td>
<td><strong>Logical</strong></td>
</tr>
<tr>
<td><strong>Looks for causation</strong></td>
<td><strong>Can handle abstract concepts</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Advantages</th>
<th>System 1</th>
<th>System 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Speed of response in a crisis</strong></td>
<td>Creativity through associations, so good for expansive thinking</td>
<td>Allows reflection and consideration of the “bigger picture”, options, pros and cons, consequences</td>
</tr>
<tr>
<td><strong>Easy completion of routine or repetitive tasks</strong></td>
<td>Can handle logic, maths, statistics</td>
<td>Good for reductive thinking</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disadvantages</th>
<th>System 1</th>
<th>System 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jumps to conclusions</strong></td>
<td>Unhelpful emotional responses</td>
<td><strong>Slow, so requires time</strong></td>
</tr>
<tr>
<td><strong>Can make errors that are not detected and corrected, such as wrong assumptions, poor judgements, false causal links</strong></td>
<td>Requires effort and energy, which can lead to decision fatigue</td>
<td></td>
</tr>
</tbody>
</table>
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 (Slow) 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 most prevalent in security research and analysis 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 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 theoretical propositions. Describing these many different ontologies is the responsibility of the major and elective courses in your 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 observation (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**

![Etic and Emic Approaches](image_url)

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.

The goal in social science research is to identify and reduce potential research biases to ensure the achievement of research reliability and validity.

**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 a reviewer do that for you.

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 be 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 and then the specific research question, 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 is 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

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 research and analysis projects. The critical thinking element of Information is covered in two sections in this manuscript. First, this section will discuss existing Information, i.e., what do we already know about the specific research question. Second, later in the manuscript we will discuss data collection to fill information gaps that exist in our research project.

**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 in a person becoming a “life-long learner.”

**Locating Information**

The EKU Libraries provide a reference librarian who specializes in security research. Once you have a general and specific research question, this is the first person you should contact. The EKU libraries also maintain a Homeland Security Subject Guide at [http://libguides.eku.edu/homelandsecurity](http://libguides.eku.edu/homelandsecurity), which will assist in your information search.

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 finally on the internet. A good strategy for searching sources is to start with the Homeland Security Subject Guide and in priority order use keyword searches to access in priority order:

- Articles (online databases and paper journals)—provides latest information
- Books (paper and online)
- Government Reports, Think Tank Reports
- Westlaw (news, business, law database)
- Newspapers/Magazines (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 works as they tend to possess more reliability and validity than other works. Table 4 provides a summary of the characteristics of scholarly and popular sources you will find in your literature searching.
Table 4. Scholarly versus Popular Literature

<table>
<thead>
<tr>
<th></th>
<th>Scholarly 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)</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 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>
<tr>
<td>Research Project</td>
<td>Expect to cite this many</td>
<td>Expect to read this many</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Doctoral dissertation</td>
<td>100 to 200</td>
<td>400-700</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>10 or fewer</td>
</tr>
</tbody>
</table>

Hints on Conducting Literature Searches and Preparing Literature Reviews

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 and preparing a literature review. Most of it is common sense (but common sense is anything but common) and comes down to four main points (herein labeled the Golden Rules). First, do it one paper at a time. Second, keep copies of every document. Third, read what you collect. Fourth, interact with the literature with a pen and highlighter. If you do all that, the literature review will almost write itself.

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 reviewing 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 and reviews can seem overwhelming, especially reviews for major research papers, 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 review is built one document at a time.

A literature review is a story about a journey: your journey through scholarship in your particular field. If you remember that it is a story of a journey, a literature review is easier to write. 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 review 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 writing a literature review 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 “review” as well as on “literature” and this means 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 review (and the last two would not always be appropriate to a stand-alone review). 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: What this sub-section generically calls a “literature review” makes up the Literature Review and Theoretical Framework section of most research papers. This section of your research paper has two main purposes: (1) to summarize and critique the existing knowledge on your specific research question, and (2) to develop the theory or model that you intend to employ in the study at hand.

**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. Making that error also makes it harder to write a good literature review.

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 reviews (and other sections of documents) are easier to write if you remember this.
"The Nightly News" versus "Four Corners" or What Makes a Good Review?

A lot of reviews are just an account of who did what and when and can be as superficial as the six o'clock news. That approach which consists mainly of historical and contextual background material is not acceptable as a literature review.

In contrast, a good review is more like Four Corners. It first tells the reader the findings of the work related to the specific research question and how the researcher obtained those findings. Second, it then presents the facts. Third, it shows their consequences and implications in understanding our current knowledge on the specific research question. Fourth, a well developed literature review goes behind the facts to show the issues that have been dealt with in the past, the issues that need to be dealt with today, the gaps and ambiguities in the state of our knowledge, and so on.

Sometimes, researchers think that it is not their place to comment on others’ research and that their role is more like that of some interplanetary observer. Those people usually short-change themselves because the Nightly News approach leaves competence to be inferred from the scope of the review whereas the Four Corners approach makes competence more apparent because the analysis and comment proves understanding of the content and issues.

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

Keep copies (a) so that you know exactly what an author said, 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 copy, make sure that you get the full citation.

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 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
mater or routine). If you copy 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 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 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 review, 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 paper 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 research paper 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.)

**Writing the Literature Review**

Depending on the research project purpose and tasking, you will likely use either an Annotated Bibliography or a formal Literature Review format for presenting the results of your literature searching. In some projects you may use both formats.

**Developing an Annotated Bibliography** (Following information was modified from the Purdue OWL, 2016.)
An annotated bibliography includes a summary and/or evaluation of each of the sources. Depending on your project or the assignment, your annotations may do one or more of the following.

**Summarize:** Some annotations merely summarize the source. What are the main arguments? What is the point of this book or article? What topics are covered? If someone asked what this article/book is about, what would you say? The length of your annotations will determine how detailed your summary is.

**Assess:** After summarizing a source, it may be helpful to evaluate it. Is it a useful source? How does it compare with other sources in your bibliography? Is the information reliable? Is this source biased or objective? What is the goal of this source?

**Reflect:** Once you've summarized and assessed a source, you need to ask how it fits into your research. Was this source helpful to you? How does it help you shape your argument? How can you use this source in your research project? Has it changed how you think about your topic?

Your annotated bibliography may include some of these, all of these, or even others. You should get specific guidelines from your instructor.

Writing an annotated bibliography is excellent preparation for starting a research project. Just collecting sources for a bibliography is useful, but when you have to write annotations for each source, you're forced to read each source more carefully. You begin to read more critically instead of just collecting information. At the professional level, annotated bibliographies allow you to see what has been done in the literature and where your own research or scholarship can fit. To help you formulate a thesis: Every good research paper is an argument. The purpose of research is to state and support a thesis. So a very important part of research is developing a thesis that is debatable, interesting, and current. Writing an annotated bibliography can help you gain a good perspective on what is being said about your topic. By reading and responding to a variety of sources on a topic, you'll start to see what the issues are, what people are arguing about, and you'll then be able to develop your own point of view.

Extensive and scholarly annotated bibliographies are sometimes published. They provide a comprehensive overview of everything important that has been and is being said about that topic. You may not ever get your annotated bibliography published, but as a researcher, you might want to look for one that has been published about your topic.

The format of an annotated bibliography can vary, so if you're doing one for a class, it's important to ask for specific guidelines.

The annotations for each source are written in paragraph form. The lengths of the annotations can vary significantly from a couple of sentences to a couple of pages. The length will depend on the purpose. If you're just writing summaries of your sources, the annotations may not be very long. However, if you are writing an extensive analysis of each source, you'll need more space.
You can focus your annotations for your own needs. A few sentences of general summary followed by several sentences of how you can fit the work into your larger paper or project can serve you well when you go to draft.

**Sample APA Annotated Bibliography Entry**


In this book of nonfiction based on the journalist's experiential research, Ehrenreich attempts to ascertain whether it is currently possible for an individual to live on a minimum-wage in America. Taking jobs as a waitress, a maid in a cleaning service, and a Walmart sales employee, the author summarizes and reflects on her work, her relationships with fellow workers, and her financial struggles in each situation.

An experienced journalist, Ehrenreich is aware of the limitations of her experiment and the ethical implications of her experiential research tactics and reflects on these issues in the text. The author is forthcoming about her methods and supplements her experiences with scholarly research on her places of employment, the economy, and the rising cost of living in America. Ehrenreich’s project is timely, descriptive, and well-researched.

**Developing Formal Literature Reviews**

A literature review is a critical summary of what the literature says about your specific research question. A sample format for literature reviews can be found in the Purdue Online Writing Library in pages 3-6 of the APA Sample Paper at [https://owl.english.purdue.edu/owl/resource/560/18/](https://owl.english.purdue.edu/owl/resource/560/18/)

**Summary-critique of an individual work (minimum requirements):**

Smith (2006) offers…then present the researcher’s direct or implied findings related to your specific research question…. Next discuss how the author came to his or her findings--things to discuss include: (1) type of paper (scholarly social science, scholarly historical, journalistic, policy-related, etc.); (2) theory, model, logic, or reasoning used in the study (if any—it may be a historical or journalistic work using only intuitive analysis—if this is the case say so); (3) data collection methods (if pertinent), (4) data analysis method (probably intuitive if there is no noticeable systematic methods in evidence); and (5) any biases and limitations to the study (here you may have a lot to say as many writers have very biased views of why things happen—see material in this manuscript on evaluating biases in scholarly works).

After presenting the above basic material on each work, then you can proceed to discuss insights or provide other discussion that demonstrates to the reader the importance of this work in understanding the current state of our knowledge on your specific research question.
Organize the literature review for individual course papers as follows:

**Literature Review**

- Summary of Overall Literature (2-3 paragraphs)
- Work 1 summary-critique (2-3 paragraphs)
- Work 2 summary-critique (2-3 paragraphs)
- Work 3 summary-critique (2-3 paragraphs)
- Work 4 summary-critique (2-3 paragraphs)
  etc., etc.

The literature review section needs no conclusion--just a good transition into the Theoretical Framework section (if developed separately). A discussion of the gaps in the literature may be included either at the end of the Literature Review section or at the start of the Theoretical Framework section.

**What to Do When There is No Literature on Your Specific Research Question?**

Remember the purpose of the literature review section is to summarize and critique the existing knowledge on your specific research question. This then allows us to identify gaps in the existing knowledge (literature) we can use for designing our study.

There is no requirement to use only scholarly social science books or articles in the literature review—you should use these if they exist. You may also use published historical scholarly works on your specific research question. However, at times, especially if your topic is very contemporary, the current state of our knowledge on your specific research question may only reside in journalistic materials, think tank reports, or possibly government reports.

While there are no concrete rules to use when there is very little to no literature on your specific research question, there are three general options as far as developing a literature review. Which option you use will depend largely on your specific research question.

1. **Change Level or Units of Analysis.** Instead of looking at the literature on your specific research question, you can go up or down a level of analysis and look at literature there. For example if your specific research question deals with explaining Venezuelan nuclear policy (where there is no literature) then you may have to shift levels of analysis to explaining South American nuclear policy and how it relates to Venezuela. Or if you are looking to predict insurgency tactics in Turkey (where there is little literature), you may have to look at the insurgency tactics in Iraq—which is then a change in unit of analysis (Turkey to Iraq). Sometimes you may even have to shift the literature review to addressing the general research question for your study—again it all depends on the specific research question.

2. **Link Back Related Literature.** While there may not be any literature on your specific research question, there may be some very closely related literature that allows you to link it back to your specific research question. For example, your specific question might
be “Why is the US government not building a wall across the US Southwest border with Mexico”—where there is limited literature. You may be able to find closely related literature on other US border control tactics or policies the US is using and link it back to your specific research question.

3. **Combine the Literature Review and Theoretical Framework Sections.** The third option is to develop a joint Literature Review and Theoretical Framework section and use the entire section to develop the theory or model for your study. Here you might have limited literature on your specific research question, but do have enough related literature, plus you are able to use the narrative of your own logic and reasoning, to build your study’s theory or model. You will find this option widely used in many scholarly publications.

**Warning:** A Literature Review is not a license to just present a bunch of historical or contextual background material on your general topic (The Nightly News approach). The literature reviewed must be focused on either summarizing or critiquing our existing knowledge on your specific research question (or at a different level or unit of analysis—or by links from the literature back to the specific research question) or it has to participate in the development of the theory or models for your study.

**The Embarrassment of Mismatches between Text and Bibliography**

It is common for your supervisor to try and reconcile the references cited in the text with those in the list of references. Discrepancies are both embarrassing and frustrating. So take extra care to make sure your in-text citations are properly inserted and correspond exactly with the final List of References.

**If You Forget Everything Above ...**

Here is the essence of writing a good review: Read - Think - Write - Read - Think - Write - Read - Think - Write -and keep going until you are done. This is a cyclic process and a good literature review is rarely written on the first cycle.

**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 include in your literature review. Not all criteria will apply to every study—nor 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 papers. 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)?

Elements: Points of View (Perspectives) & Assumptions

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 come 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.

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 your own points of view and assumptions. 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). Assessing the validity of assumptions allows the analyst to identify manipulative or false reasoning in a situation.

Note: Some references refer to value and descriptive assumptions. Value assumptions are a combination of paradigmatic and prescriptive assumptions. Descriptive assumptions are both causal in nature and apply to the accuracy and validity of data, evidence, information, etc., used in an argument.

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.

**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 dominate 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 research. 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. 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 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**

![Figure 6: Four Ways of Seeing](image)

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.
  - 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!
  - 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:
  - Why am/are I/we confident the assumption is correct?
  - In what circumstance might it be untrue?
  - Could it have been true in the past but no longer be true today?
  - How much confidence do I/we have that the assumption is accurate or valid?
  - 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:
  - Basically supported or solid.
  - Correct with some caveats.
  - 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 5 matrix format.
- **Use the final list to inform your analysis.**
Table 5. 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 cooptation 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 group is the single most important governing 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), 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 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 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 Political 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 6 displays the general conditions associated with the three types of political cultures.

### Table 6. Coordinates of Political (and Organizational) Culture

<table>
<thead>
<tr>
<th>Types of Political Culture</th>
<th>Collectivist</th>
<th>Individualistic</th>
<th>Egalitarian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forms of Societal Rule</td>
<td>Hegemony</td>
<td>Hierarchy</td>
<td>Heteronomy</td>
</tr>
<tr>
<td>Types of Government</td>
<td>Totalitarian, Authoritarian, etc.</td>
<td>Transitional or Weak Democracies</td>
<td>Mature or Strong Democracies</td>
</tr>
<tr>
<td>Political Process Model</td>
<td>Executive Advisors and Executive Only</td>
<td>Interest Groups, Legislature, Gov’t Orgs. Executive Advisors and Executive</td>
<td>All Actors Eligible (Exact Actors Differ by Issue)</td>
</tr>
<tr>
<td>Actors that Most Affect Decisions or Policy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Levels of Elite Accountability</td>
<td>Little</td>
<td>Some</td>
<td>Significant</td>
</tr>
<tr>
<td>Economic/Resource Management Systems</td>
<td>Patrimonial</td>
<td>Statist</td>
<td>Market</td>
</tr>
<tr>
<td>Levels of Social Trust or Social Capital</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Levels of Mass Participation</td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Elite Corruption Behaviors</td>
<td>Pirates</td>
<td>Opportunists</td>
<td>Paragons</td>
</tr>
<tr>
<td>Societal Political Corruption Patterns</td>
<td>Systemic (Severe)</td>
<td>Institutional (Moderate)</td>
<td>Incidental (Low)</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 and assumptions. It will also be used in your research in developing your project’s theoretical framework and in conceptualizing your research.

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 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.

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’am!” (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.

**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 7 wheel of science (social science).

Figure 7 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 review to see what others have found in investigating the same or similar questions. During the literature review the researcher will find what variables or models others have used in their studies. The researcher then identifies 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 the same as the Figure 3 Critical Thinking Social Science framework.

**Figure 7. Wheel of Science** (traditional approach)

![Wheel of Science](image)

**A More Conceptual View of The Scientific Method** (aka: positivism, logico-empiricism, 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.

<table>
<thead>
<tr>
<th>Rationalism</th>
<th>Theory</th>
<th>Theoretical Propositions</th>
<th>Theoretical Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empiricism</td>
<td>Research</td>
<td>Research Hypotheses</td>
<td>Operational Definitions</td>
</tr>
</tbody>
</table>

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 proved or disproved. Most theories have a number of assumptions about how the world works that support their theories. For example, in Marxist theory, it is assumed a state’s type of economic system determines its political and social structures.

- **Axioms:** 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. 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>
<thead>
<tr>
<th>Rationalism</th>
<th>Theory</th>
<th>Theoretical Propositions</th>
<th>Theoretical Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empiricism</td>
<td>Research</td>
<td>Research Hypotheses</td>
<td>Operational Definitions</td>
</tr>
</tbody>
</table>

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 the **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 or policy-making).
**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.

**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).

Examples of Properly Written 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 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. When grading your research assignments I will be looking for this consistency.

**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.

**Figure 8. 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 (as part of developing the literature review and theoretical framework section of the study) is to establish an abstract causal model or diagram—by abstract we mean that the causal 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 of 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:

$$X_1 \rightarrow Y_1$$
When there is an **intervening** variable:

![Diagram of an intervening variable]

When there is an **antecedent** variable:

![Diagram of an antecedent variable]

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:

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

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 review 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).

Below is a summary of what we expect to see in the Theoretical Framework section of your assignments if you are using structural theories you have developed from the literature.

a. A summary of the gaps in the literature on your specific research question (but only if you did not put this at the end of your Literature Review section).

b. A narrative summary of the your structural theory starting with the dependent variable and then a discussion of each independent variable in your structural model with a justification for its
inclusion including identification of its source (literature review, your own logic and reasoning, etc.) and of how it is expect to affect (cause change in) the dependent variable.

c. A diagram of your completed structural model.

d. A list of the hypothesis (es) generated by the structural model that you will test in your study.

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 study 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.

\[ Y_1 = \text{Probability of Two States Going to War} \]

\[ X_1 = \text{Static Capability Balance} \]

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)

\[ X_2 = \text{Dynamic Capability Balance} \]

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)

\[ X_3 = \text{Contiguity/Proximity} \]

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

\[ X_4 = \text{Alliances} \]

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

\[ X_5 = \text{Regimes (Political Systems)} \]

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

\[ X_6 = \text{Economic Development} \]
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)

\(X_7 = \text{Enduring Rivalries}\)

Theoretical Proposition: Two states that have had recent conflicts or historical enduring rivalries are more likely to go to war. (Based in empirical fact)

**Figure 9. Geller and Singer (1998) War-Prone Dyad Model**

| \(X_1\) = Static Capability Balance | \(Y_1\) = Probability of Two States Going to War |
| \(X_2\) = Dynamic Capability Balance |
| \(X_3\) = Contiguity/Proximity |
| \(X_4\) = Alliances |
| \(X_5\) = Regimes (Political Systems) |
| \(X_6\) = Economic Development |
| \(X_7\) = Enduring Rivalries |

**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 Hypotheses**

Students sometimes struggle with writing good hypotheses. Therefore, the following guidance is provided for those writing 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 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 are having problems with transitioning from writing papers 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, and their synonymous names (in parentheses), include: (1) realism (neorealism), (2) liberalism (idealism, pluralism), and (3) Marxism (radicalism, globalism, critical theory). 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. After each theoretical approach, I provide a short discussion on how each approach traditionally views the causes of war. I end this handout with a discussion of several key issues in social theory.

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.

**Summary of Realist Explanations for the Causes of War by Realist Sub-Theory**

**Complex Realism:** Looks at the three main causes of war as 1) human nature (rage,
pride, reputation, etc., 2) differences in the nature (governing mods, economic structures,
cultures) of the domestic states and societies among belligerents, and 3) the nature of the
interstate system (shifts in relative power, capability balances, etc.) [You will see that these three
factors are also included in the below subcategories of realism--I guess that is why they call this
one complex.]

**Realist Fundamentalism:** Looks at the state of war being caused by the individual
leader’s or the citizen’s human nature. Leaders go to war because they seek to enhance personal
pride or to maintain national security for the citizens. The behavior of leaders is rooted in man’s
psychological and material needs (e.g., Maslow’s hierarchy of needs). Fundamentalism sees all
nations struggling for superior power and applies this logic to individuals as well.
Fundamentalism also views leaders utilizing war to preserve themselves and realize their
personal ambitions.

**Realist Structuralism:** Looks at the state of war is caused by interstate anarchy and
states acting as independent units and constantly bumping into each other (billiard ball analogy).
The security dilemma, whereby one state improves its security by building a larger military—
only to have actually decrease its security as its neighbors get worried and start building their
militaries too (i.e., a perpetual arms race)—is usually caused by perceptions or misperceptions of
state leaders. Realist structuralism assumes that state actors differentiate in capabilities but not
ends. State behavior is made rational and power seeking through competition and socialization.
The focus is on interstate systems. Four assumptions of the Structuralist theory are 1) the world
is an international system of anarchy where there is a lack of world government. 2) states are
coherent units, each seeking at a minimum to survive, and ultimately to expand in capabilities. 3)
states rely on self-help for security in the absence of any global law, act to increase capabilities,
but negotiate rather than fight, fight rather than pass up an opportunity to increase its capabilities.
4) statesmen estimate the balance of power rationally, by measuring and comparing capabilities.

**Realist Constitutionalism:** Looks at the state of war being caused by a mutual intention
of states to destroy the enemy state. Rousseau dictates the state of war as a relationship between
states, not men, and that it has its origins in differing constitutions among states. Rousseau
dictsates that, as a society evolves from simple subsistence farmers to more mechanized industry
and structured government, the initial free equality that existed between its people and their
neighbors in another society will transform into mistrust, incorrect assumptions, and deception.
Each comes to consider the other as a threat to its welfare, rather than a simple neighbor.
Rousseau also described the formation of a social contract that eventually leads to society's elite
using entire armies to exact their will. This model focuses on world politics and consequences of
domestic reform or revolution.

**Liberalism – 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.

**Summary of Liberal Explanations for the Causes of War by Liberal Sub-Theory**

**Liberal Institutionalism:** A Liberal Institutionalist views human rights and
statesmanship as the motive for laws and institutions. The citizens set up the state to uphold the
natural rights of life, liberty, and property. States are still under anarchy, as there are no
governing institutions above the states, but states are not considered to be in a constant state of
war. The state of nature is such that man obeys natural laws that give natural rights and duties.
Individuals and states have the natural right to enforce these rights and to punish those who
violate the rights of others. States will enter into a state of war when they perceive the need to
enforce the natural rights or to punish a violator of natural rights.

**Liberal Commercialism:** Liberal Commercialists view market societies as
fundamentally against war. In their minds, states have three duties, 1. Protecting society from
violence and invasion, 2. Administering justice, and 3. Building institutions. States would engage
in war as a function of the spoils of war versus the cost of war. If a particular society’s spoils
out-weigh the cost, war would be likely. War could also be the result of a society’s perception
that it needs to protect itself from violence and invasion.
**Liberal Internationalism:** From a Liberal Internationalist viewpoint, states live under international anarchy, but it is made subject to international law rather than to fear and threat of war. International laws, however, do not guarantee justice. States have the right to make war when they are injured and the legal proceedings do not provide satisfaction. But, states may also make war when they perceive they are injured, when they experience a threat, or when another state achieves an alarming increase in power, which follows the right to maintain a balance in power. It is also viewed that Liberal states will be at peace with other Liberal states. Liberal states will go to war with non-liberal states for defensive necessity. Additionally, Liberal states will initiate aggressive policies toward non-liberal states, which may provoke a rival to initiate war.

**Marxism – 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.
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 populates 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.

**Summary of Marxist Explanations for the Causes of War**

**Marxism-Leninism:** 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 – 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. The postmodern approach professes no particular epistemologies or ontologies for themselves. 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. For example, feminist theorists 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.

**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, earlier it was mentioned that 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.

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

The theorized causal mechanism for this variable relationship explains that when both states are democracies, then 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 posses.

**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 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 Behavioralism. 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 Behavioralism 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 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, that 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 approaches that are found in the 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. 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.

Note: Most instructors leave it to the student to select which approach to theory they use in their course work. Do not feel that you must pick and stay with one particular approach in your work. For example, while I tend to be a realist, I draw heavily on the liberal social constructivist approach in my own research. Additionally, I find the Marxist World Systems Theory particularly compelling in explaining the differences between developed and developing states. I do not use postmodernism—because I am so strongly positivist. You must decide for yourself which of these theoretical approaches you will adopt in your own work. There is nothing right or wrong about any of them—they are just different.
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

In the security community, most 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

Forsett, D. (2012) provides the basic creative thinking techniques of Fusion, SCAMPER and 5Ws + 1H as 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 7. 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.
Research Design

Once the researcher has completed the design of their conceptual model and/or develop a list of alternatives to test, they must develop a detailed research design. This includes operationalizing variables (developing a measurement plan), developing a sampling plan, developing a data collection plan, 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. Following sections will provide material on data collection planning and data analysis. See the earlier section on Why Critical Thinking? for details on evaluating bias in your research.

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.” You will see how 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; moderate, liberal 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 8. 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></td>
<td></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 10. Sampling

The idea of sampling is very simple as depicted in Figure 10. 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**. 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 9. Stratified Sampling Example

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

**Good Research Designs Prevent Poor Research**

A good research design is your most important step toward completing a good research project. Your research may require that you construct a scientific or empirical-based research project (one where you use empirical data to develop, advance, or test your theoretical component) and not a project that is solely theoretical or policy-related. Below is a discussion of items you
should consider including in a research design if your tasking requires you to develop a separate research design. It also provides a good checklist of items that you should consider before completing any research project. Not all of the below items apply to every research design.

**NOTE:** The below discussion is applicable to situations where the student is submitting a research proposal, such as developing an independent study proposal, Honor’s thesis proposal, graduate thesis proposal, etc., —i.e., cases where the field data collection and analysis have not been conducted and approval is sought for the larger research project. For more detailed guidance on developing a complete research project see this manuscript’s section on Getting an A on Your Research Project.

**Introductory Section:** The research design introduction sets the context for the study and states the central problem you will address in the study. At a minimum, you must identify your research subject and explain why it is important that you study the subject. Normally, somewhere in the initial introduction is (are) your research question(s). The process of developing your research question helps you focus your study. This is where you have to ask yourself what is it about the research subject that interests or puzzles you the most. It is impossible to study everything on a subject. You have to limit your study and that starts with developing good research questions. You should have both a general and specific research question (having several specific questions is not uncommon—but don’t let it get out of control). Your final research questions should be presented somewhere in your introduction. Other elements that you may include in your introduction are: a purpose of the study, objectives of the study, and significance of the study. Definitions of key terms may also be included in the introduction (these are conceptual definitions and not operational definitions that are covered later). You may also want to include a “road map” near the end of the introduction that tells the reader what they will see in the rest of the research design. It is often good to start your introduction (of both your research design and final study) with a “grabber”—a quote; some illuminating statistical data; or a strong declarative, emotional statement that captures the essence of your study and peaks the readers interest as to what will come next.

**Literature Review/Theoretical Perspective:** Literature reviews are required for every social science research design. The literature review tells us what others have found in their research about your research subject, it critiques what is right or wrong with these other studies, and then discusses how your study will fill the existing gaps or otherwise add to our knowledge about the subject. The simplest literature reviews normally have: (1) a short introduction summarizing the overall scholarly literature on the subject and identifying the variables you are going to discuss (these should be your study’s dependent and independent variables which is where you should be concentrating your literature search efforts), (2) a discussion of what is known about the dependent variable followed by a discussion of what is known about each independent variable (in its relation to the dependent variable(s)), (3) a critique of the literature’s good and bad points, and (4) a discussion of the gaps your study will fill or the knowledge it will create. A slightly more complex literature review will: (1) review individual works and summarize what other authors have offered as an answer (their findings) for your specific research question (i.e., it summarizes the existing knowledge on the specific research question), (2) critique the work’s research design, and (3) discuss how the individual work contributes to our knowledge on the specific research question. If you did not give conceptual definitions of
your key variables in the introduction to the research design, then including them in the literature review is a good idea. Also, make sure any control variables or other extraneous variables that relate to your study are addressed. While the main focus of the literature review is to summarize and critique what others have found about your subject, you can also include a discussion of what you have found in your previous research (if you have done any). This is especially important if your previous research has still not answered your research questions to your satisfaction. Some research designs also place their theoretical perspective in the literature review (others have a separate theory section). When you include the theory in the literature review, weave it into the discussion of your variables, as the theory will show the relationships others have found among those variables. It is also a good idea to include in the theoretical discussion (whether in the literature review or in a separate section) a narrative of the main theoretical propositions (assumptions, axioms, postulates, facts, laws) of your theory. The theoretical framework should end with a narrative or diagram summary of the causal model for your study and a statement of the study’s hypotheses.

**Research Design:** This is the meat of your research planning. It tells others exactly how you are going to carry out your study. There are a number of individual items that go into the research design section. Start with a short summary introduction of your research design that spells out your research strategy. Make it clear what type of study you will conduct (qualitative, comparative, or quantitative—this will depend on your research question(s), method(s) of data collection, and the goals for your study (testing or advancing theory, giving voice, etc.)). It is also good to identify whether your study is going to be descriptive, explanatory, or predictive (or a combination of these—which depends largely on the research question(s) you are addressing, e.g., for explanatory studies you will be asking “why” and “how” questions.).

Include your hypothesis(es) (if not at the end of the previous section) and operational definitions of all dependent and independent variables. If your study will be constructing its own theory, or making major modifications to existing theory, here is where you should briefly discuss your theoretical effort and tie it into the generation of your causal diagram and hypothesis(es). If at this point your theoretical effort is not well advanced, you may have to use working hypothesis(es) that are stated in broad terms.

Identify your unit of analysis, population (population that you intend to infer your final results to), and sample. Discuss your sampling method (probability or non-probability) and how you will ensure representativeness (equal probability of selection method if a probability sample). Explain how if you are using a probability sampling method that your results will ensure 95 percent confidence (or if not why—95 percent confidence is the normal social science goal). If using a non-probability sampling method, make sure you justify its use—in a qualitative case study this means justifying how you selected your cases.

Discuss your planned research methods (data collection plan). Will this be a single-method or multi-method (triangulated) study? Multi-method studies are normally more valid. What role will you (the researcher) have in the data collection (those who use only secondary data or contract for data collection may have little or no role)? What measures are you using to ensure reliability of your data collection effort (i.e., if someone else used the same sampling method and data collection plan would they get the same results)? You should include self-developed data collection instruments (i.e., content analysis or participant observation tally sheets, interview
questions, focus group moderator guide, surveys, etc.) as appendixes to the research design. If using standardized instruments (standard tests, surveys, etc.), or secondary data sources, discuss them and how their originators ensured reliability. Discuss how the data collected will be recorded and managed.

Briefly, discuss your method of data analysis (what qualitative, comparative, or quantitative method(s)). Will you require special equipment, software, or other assistance to complete the analysis?

How will the study ensure overall reliability and validity (both internal and external)? If someone followed your exact research design, would they get the same results? Internally, is your research design consistent from top to bottom and will you be able to analyze cause and effect (i.e., have you met all the requirements of causality—time-ordering, non-spuriousness, co-variation, and having a theory)? Externally, will your final study results allow you to infer or generalize the social behavior investigated to your larger population?

What problems may be encountered in the data collection, especially problems with access to data/informants, informant reciprocity issues (payments, etc.), and research ethics issues?

What are your study delimitations and limitations—you cannot study everything about your research subject? Your research question(s) and research design will naturally limit what you can really learn about the subject. You will also purposely delimit your study so that it can be completed within the time and resources available.

What is your study time-line? Indicate key dates and actions you planned to have completed. If the research design is fairly complex, do you have a management plan to ensure its completion? Provide a section or chapter outline of your final study.

What is the feasibility of your research design? Do you have the skills (data collection, data analysis, etc.), time, and resources to actually conduct the research design as presented?

At the end of your research design include a list of references including substantive scholarly, policy-related, or intelligence works.

Note: There are no exact formats for organizing a standalone research design (proposal). Separate introduction, literature review/theoretical framework, and research design sections are fairly standard. Beyond that, it is up to the researcher to organize the material in a logical order. One check to see if your research design is complete is to perform a self-critique, using the standards above and those in the previous research study critique. When written properly, the introduction, literature review/theoretical framework, and research design become the first half or more of your final research paper—the Findings, Conclusion, and References sections make up the remainder of your study.
Element: Information (Data Collection to Fill Gaps)

In some research projects you may find the literature search uncovers all the information (data, facts, evidence, information, etc.) you will need to develop your theory and model, construct your alternatives and test your hypotheses. However, this is usually not the case and most social science research projects require a focused data collection effort. This section provides material to help with your research design and actual data collection efforts.

Empirical Data Collection Methods.

Figure 11 summarizes empirical data collection methods and shows the types of studies they normally support. Basic Research Methods textbooks explain how to conduct empirical data collection and you should consult them for specific procedures for participant observation, interviews, unobtrusive measures, narrative analysis, content/document analysis, and surveys. Figure 11 demonstrates where statistical and descriptive inference comes into play in the research process. **Statistical inference** is a well developed branch of statistics, based in probability theory, which allows the researcher to study and conduct hypothesis tests on a representative sample and then refer those results to a larger population. The concept of "**descriptive inference**" is newer and is not widely understood, but in essence it indicates that if the researcher follows closely the rules of social science in conducting qualitative and comparative research, then the study may be used to infer to similar cases as those studied (King, Keohane & Verba, 1994).
Qualitative data collection starts with developing a plan for the collection effort that will collect data on your dependent and independent variables or other factors under analysis, such that the data can be used later in reaching your findings. A well-designed research study seeks to protect the rights of human subjects involved in the data collection. A data collection instrument as detailed in Table 10 is required as part of your data collection planning.
Table 10. Data Collection Instruments

<table>
<thead>
<tr>
<th>Data Collection Type</th>
<th>Data Collection Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviews (structured or semi-structured)</td>
<td>List of interview questions. Questions must concentrate on collecting data on the variables in your hypotheses.</td>
</tr>
<tr>
<td>Focus Groups</td>
<td>Focus Group moderator's guide with questions included (sample guide provided at end of this section). Questions must concentrate on collecting data on the variables in your hypotheses.</td>
</tr>
<tr>
<td>Survey</td>
<td>List of survey questions. Questions must concentrate on collecting data on the variables in your hypotheses.</td>
</tr>
<tr>
<td>Participant-Observation</td>
<td>Tally sheet with operational definitions of variables of interest from your hypotheses.</td>
</tr>
<tr>
<td>Unobtrusive Measures</td>
<td>Tally sheet with operational definitions of variables of interest from your hypotheses.</td>
</tr>
<tr>
<td>Content Analysis</td>
<td>Tally sheet with operational definitions of variables of interest from your hypotheses.</td>
</tr>
</tbody>
</table>

Conducting Focus Groups

Focus groups provide a method to collect a large amount of qualitative data in a short time. Focus groups are specialized interviews, where instead of interviewing an individual, you interview an entire group of individuals at one time about the same subject. Focus group methodology can be traced to World War II, where the technique was used to solicit public opinion on various subjects dealing with war bonds, rationing, and home-defense issues. Today, marketing specialists make extensive use of focus groups to obtain opinions on new products and advertising campaigns. Political candidates also make wide use of focus groups today to determine electorate opinions on key issues and reactions to potential campaign statements and platform items. As explained below, focus groups are also being used more and more to collect qualitative data for social science research projects.

Focus Group Logistics

Participants. The best focus groups include 8 to 12 participants. The participants should represent the population you are studying, but do not have to be drawn from a representative sample. The participants are normally from a purposive or judgmental sample. The participants should be from a homogeneous group in order to make them more at easy and thus more likely to participate in the focus group discussions. It is usually not a good idea to mix social classes, ethnicities that might have conflicts, or sometimes even genders in the same focus group. It is best if participants do not know each other, but this is not always possible. The
reason you try to get 8 to 12 participants is that you will normally have 2 to 4 participants that will not participate in the discussions. Unless you know your participants well, it is usually a good idea to invite 15 to 16 persons to participate. Do not worry if you get less than 8 participants. Excellent focus groups have been run with as few as 4 to 6 participants. It is sometimes appropriate to pay the focus group participants for their time. In focus groups you are looking for personal insights and opinions. Normally you do not want the participants to “prepare” for the focus group, so it is usually a good idea to keep the actual subject of the focus group a secret until the participants arrive at the focus group location.

**Focus Group Facility.** The best facility to use is a conference room with an oblong table and chairs so that the focus group participants can all face each other. Other arrangements where the focus group participants can face each other (even around a living room) is acceptable. Professional focus group facilities have the focus group room with table and chairs, unobtrusive microphones and video cameras installed, and a two-way mirror so that focus group observers can watch the proceedings but not be in the same room with the participants. In lieu of such a facility, use tape recorders and video recorders, and have observers seated out of the way so they do not distract the focus group participants.

**Research Team Assignments.** A moderator will direct the focus group. The moderator should have no duties during the focus group discussions except to direct the proceedings using the Moderator’s Guide (sample below). The moderator should not operate the tape equipment or take notes. A second researcher should be in charge of operating the tape equipment and make sure they have extra tapes, batteries, and even back-up equipment. A third researcher should take detailed handwritten notes of the focus group sessions. Much of the information gained during the session will come from body language that is not recorded on tapes but only from the participant-observation of this or other observers. Other researchers, if available, should be assigned duties to greet participants, supervise the completion of permission forms and pre-focus group surveys, dispense refreshments, pay participants at the end of the focus group, and for other administrative duties.

**Conducting the Focus Group.** A normal focus group runs 45 to 60 minutes. After 60 minutes, you will start to lose the participants’ attention. One advantage of focus groups is that during this period you will obtain the equivalent of 8 to 12 individual interviews (which might take 10-15 hours if done separately). More importantly, you will get what individual interviews will not give you—the interaction effects among the focus group participants. People often speak more openly about a topic when they know others in the room have similar experiences. Frequently, focus group participants will challenge the answers of other participants, which will lead to more fruitful group discussions. The most important thing to strive for in the focus group is to obtain the interactions among focus group participants—no other data collection technique collects this form of data.

It is recommended that you use a pre-focus group survey. The survey will allow you to collect demographic data on the participants and to obtain their un-coached answers to key questions (during the focus group their answers might be influenced (coached) by the moderator or other participants). At times, it is a good idea to use the last question on the pre-focus group survey as the first question of the actual focus group. You may also use a post-focus group survey. If your
larger research project will include a survey, it is a good idea to use focus groups to pre-test the survey.

The moderator is responsible for keeping the focus group moving. The moderator must get the interest of the group early. They must keep the group on the research topic (there is often a natural tendency to wander off the main topic). The moderator must be able to recognize when an answer needs probing to obtain a deeper understanding of the issue. The moderator must make sure every person feels that their opinion counts and be supportive of all views that emerge in the focus group. The moderator must not be judgmental and above all make sure the participants are not put on the defensive. The moderator must be ready to handle participants that want to “hog” the entire conversation (there is always 1 or 2) or weirdoes that become disruptive to the group. The moderator must also be ready to “pull” participants who are not contributing into the discussion. No matter how good the moderator is, however, some focus groups will not run well. Several of the participants may not show. The participants may not interact well. Several of the participants may decline to talk. Participants may keep wandering from the research topic. When planning and running a focus group, always be aware that “Murphy” will be in the room (i.e., Murphy of “if it can go wrong it will” fame). At the end of the focus group, make sure if you promised the focus group participants anything (money, copies of your final report, etc.) that you follow-up on these promises immediately.

**Documentation.** Immediately after the focus group, transcribe the tapes, adding notes from the observers’ fieldnotes. The final annotated focus group transcript should then be coded (see Lesson Handout on Qualitative Analysis).

**Sample Focus Group Moderator’s Guide**

**PRELIMINARIES**

Welcome the participants and thank them for coming. Introduce yourself. “Call me..?”

Inform the participants of the purpose of the focus group: “To learn more about ............” (Give them a Grand Tour of the topic and where the focus group will go.)

Emphasize that all of their answers are voluntary and will be treated as confidential. “There are no right or wrong answers to our questions. What we really want to know is (example: how you feel about certain situations and what your experiences have been).”

“There are other researchers watching the focus group (through the glass mirror).”

“We are recording the focus group: both audio recording (microphones in the ceiling) and video recording (through the glass mirror). These recordings will be destroyed after we transcribe the focus group contents.”
“Until they are destroyed, the audio and video recordings, along with your entrance surveys (if used), will be kept at .......... under lock and key. Only the researchers working on this project will have access to today’s material.”

As an Icebreaker: Have the participants introduce themselves and (example: identify how long they have worked on the topic being discussed).

After the Introductions: Refer to the last question on their entrance survey (if used) (which is normally identical to the first question below.) Ask 3 to 4 of the participants at random (or from volunteers) to tell everyone how they answered this question. Then continue with the questions.

HINTS!

Remember: Our goal is not only to get individual answers to questions, but also to spark interactions among the participants.

There is no need to follow the below questions in strict order in case one of the answers leads naturally into a later question. Also, feel free to take time to probe interesting answers.

Watch the time as we proceed!

QUESTIONS (list below).

Proceed from general to specific questions.
Ten to fifteen questions are the most you can expect to cover in a 45 to 60 minute focus group. Mark those questions that are the most important to cover in case time becomes a problem. Do not use yes-no questions. Try to design questions that will generate interactions among the participants.

FALSE EXIT

When finished with the questions (including any new questions you may have)—find a good excuse to leave the room for a moment (restroom, etc.) but ask them to remain seated—and then go to the observer room and see if there are any additional questions the other researchers would like asked.

FINISH

When all questions have been answered: Notify the participants the focus group is over and thank them again for participating.
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 analysis, 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 infers 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 infer 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. 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.

**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 the later section on Logical Argumentation).

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. 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

**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>0</td>
</tr>
<tr>
<td>Factor 4</td>
<td>-</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Factor 5</td>
<td>0</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

+ supports hypothesis, - does not support hypotheses, 0 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 review 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 statistical tables that help set the context for the study. In this example one table offered:

<table>
<thead>
<tr>
<th>Neighborhood and High School Demographics (Descriptive Statistics Example Table).</th>
<th>Northern High*</th>
<th>King High*</th>
<th>Coral High*</th>
<th>Everglades High*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neighborhood (Note 1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<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>
<tr>
<td>Immigrant and Native Minority Groups Studied</td>
<td>African-American, Caribbean (English-speaking), Haitian</td>
<td>African-American, Haitian</td>
<td>Cuban, Nicaraguan</td>
<td>African-American, Haitian, Mexican</td>
</tr>
</tbody>
</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.
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.

<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><strong>Student Fear Levels</strong></td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td><strong>Neighborhood Violence Levels</strong></td>
<td>Moderate-High</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td><strong>School Violence Levels</strong></td>
<td>High</td>
<td>High (Actual), (Low from official data)</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td><strong>School Culture of Violence Exists</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Discourse of Denial Present</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Non-Caring Atmosphere Present</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Borderline</td>
</tr>
<tr>
<td><strong>Remiss Security Forces Present</strong></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.

**Element: Interpretation/Inference (Quantitative Analysis)**

This section is a review of correlation and ordinary least squares (OLS) analysis. You may have initially learned these analytic techniques in an introductory statistics course. However, some introductory statistics courses do not have time to teach OLS. If you have not taken an introductory statistics course, the material in this section provides a good overview of what you will need for most security analysis projects.

If you have not taken an introductory statistics course, you should review a text on descriptive statistics. A good overview of descriptive statistics can be found at [http://www.socialresearchmethods.net/kb/statdesc.php](http://www.socialresearchmethods.net/kb/statdesc.php)

**ORDINARY LEAST SQUARES REGRESSION**

This section was modified from an unpublished manuscript originally created by Dr. Charles H. Wood, Center for Latin American Studies, University of Florida (February, 2003).

**Section I: The General Linear Model**

A. **Introduction**

Ordinary Least Squares (OLS) Regression is one of the most powerful and therefore most used statistical procedures for testing hypotheses or making predictions. This handout will give you an introduction to OLS. The OLS regression procedure is used for correlation, bi-variate regression (2 variables) and multi-variate calculations (more than 2 variables). OLS regression requires that your dependent variable be measured as continuous (interval or ratio). In bi-variate regression and correlation procedures, the independent or second variable must also be measured

---

1 The objective here is to explain basic principles using a visual/intuitive method. We will use no formulas unless absolutely necessary. Every few pages you will encounter an exercise (EX). Even if the EX appears to be obvious, it is important that you perform the exercise. Every EX reinforces a fundamental idea that is the basis for ideas that follows.
as continuous. In multi-variate regression, the independent variables must be measured as either continuous, or as a nominal dichotomous “dummy” variable which will be introduced to you in a later section in this handout.

Earlier you learned variables could be measured along a continuum from:

Nominal → Ordinal → Interval → Ratio

It is always possible to convert (recode) variables measured as ratio or interval to one of the lower categorical (nominal or ordinal) measures on the continuum. You cannot convert variables from nominal or ordinal to one of the higher continuous (interval or ratio) measures on the continuum. Be forewarned: whenever you convert data measures from ratio toward nominal on this continuum—you are losing information.

These observations suggest a general rule if you want to get the most out of your data and take the most advantage of the powerful OLS regression procedures: whenever you record data, always try to record the information at the lowest level of aggregation. For example, suppose you are using a survey questionnaire. You could ask the respondent his/her income in categories, such a “low,” “medium,” and “high.” Alternatively, you could ask them their actual income in dollars. The latter is always preferable. Later you can always manually, or using MS Excel functions, recode the income data measured in dollars into, three income categories if you need to do so. However, if the original data is coded into three categories, you are forever stuck with that income classification.

By the same token, whenever you are carrying out a statistical analysis, it is nearly always better to use data at the lowest level of aggregation (i.e., at the highest level of measurement). In this way you will not lose information. If you have an interval level variable to begin with, do not recode into an ordinal or categorical variable—unless absolutely necessary.

A.1 Income and Education

Past research has determined, generally speaking, as education rises, income increases. In the exercises that follow, we will introduce a new statistical technique that is more efficient and more flexible than the ANOVA (t-test) procedure you learned with Means Tables. The technique, OLS, is the most frequently used statistical method used in the social sciences. Once you understand how OLS works, you will appreciate its value.
In order to simplify the discussion, we will use a hypothetical data set that consists of only 12 cases. We will further assume that the 12 cases are evenly distributed across 12 levels of education, and that each person earns a particular amount of income, as shown in Table 1.

A glance at the two columns shows that, as the number of years of school increases, the amount of income earned increases.

But the pattern is not entirely consistent. The person with 2 years of education earns $85. The person with 3 years of education earns $50 – an amount that is $35 less. Similar inconsistencies are evident when you compare the income for individuals with 8 and 9 years of schooling.

<table>
<thead>
<tr>
<th>YEARS OF SCHOOL</th>
<th>INCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>85</td>
</tr>
<tr>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>120</td>
</tr>
<tr>
<td>5</td>
<td>70</td>
</tr>
<tr>
<td>6</td>
<td>150</td>
</tr>
<tr>
<td>7</td>
<td>200</td>
</tr>
<tr>
<td>8</td>
<td>160</td>
</tr>
<tr>
<td>9</td>
<td>140</td>
</tr>
<tr>
<td>10</td>
<td>230</td>
</tr>
<tr>
<td>11</td>
<td>200</td>
</tr>
<tr>
<td>12</td>
<td>260</td>
</tr>
</tbody>
</table>

Mean = $140.8
As you will see, OLS allows you to simultaneously take into account such variables as age, occupation and industry. In other words, OLS allows you to see the “pure effect” of education after controlling for (removing the effects of) age, occupation, and industry.

Figure 1 makes it easier to see the pattern in the above Table 1:

Figure 1

Income generally rises with education, but note the inconsistencies.

Why would this happen?

There are many reasons that could account for this pattern. Perhaps it’s just bad data. Alternatively, many data sets contain miscodes. More than likely it is due to the fact that, to take one example, the individual in our data with 3 years of schooling may be younger, or may work in a lower-paid occupation or industry compared to the individual with 2 years of schooling. And so on for the other anomalies.

When the only information you have is
“number of years of school,” we can expect the values to “bounce around” since there are probably many other factors that influence a person’s earnings – and these factors are not taken into account here. Years of schooling is therefore a good predictor of income, but clearly not a perfect predictor.

The question is “How good is it?” Also, “Does the effect of schooling decline or disappear when other variables are introduced as controls?” Regression analysis is designed to answer these questions.

B. What would a “Perfect” Relationship Look Like?

In Figure 1, the line slopes upward, as expected, but it is not a straight line. If the relationship between yrschl (years school) and income were perfect, then the line would be a straight line: For every increase in years of school, there would a constant increase in income.

If you had to draw such a straight line through the points, it is intuitively obvious where to place the line (more or less). The idea would be to position the height and the slope of the line so that you get as close to as many of the points as possible, as shown in Figure 2. This is called a regression line.

The distance between each data point and the regression line can be thought of as unexplained variance in income. In other words, for every data point, the straight line gives you the amount of income predicted for each level of education. When the association between yrschl and income is not perfect, the errors of prediction are visually obvious when the actual value in the data is above or below the regression line.

The difference between the actual income and the predicted income for an individual case is the unexplained variance in income, called the “residual.” If we square each residual and add them up the result is the residual sum of squares (residual SS). The importance of this value will become evident in the next section.
Using a visual and intuitive approach, it is possible to make a good guess about the height and the slope of the line. The idea is to minimize the errors between the straight line and the data points.

Exercise 1: Take a straight edge and decide where to put a straight line in these 3 Figures. Make sure that the line crosses the Y-axis, on the left.
Notes:

1. In Figure A, the line slopes at an acute angle. This means that, as education rises, there is a sharp increase in income. In Figure B, the line is flatter, indicating that, as education increases, income rises, but not as fast as it does in Figure A. The slope of the line tells how sensitive income is to change in education; the slope of the line tells you the magnitude of the education effect on income.

2. Both A and B are positive associations (+): as education increases, so does income. In Figure C, the relationship is negative (-): as education rises, income declines (not likely in the real world).

Exercise 2-- Test Your Eye for the Least Squares Regression Line

Log on to the following website:


In this exercise, you are presented with a swarm of data points, and are asked to drag the cursor across the points to draw your regression line.

A value will appear in the upper right-hand corner, called MSE (mean square error). This is a measure of the degree of error in the placement of your line. The number should be as small as possible. (The significance of this will become clear in the following section.)

Draw a second line across the data points. If the MSE is smaller, then your second try is a more correctly positioned regression line than your first line. Try it a third and fourth time, and see how low you can get MSE.

When you have exhausted your options, then click on the button “Draw Regression Line.” This will display the correct line. Finally, click on
“Show Minimum MSE,” which will display the correct value (i.e., the lowest amount of error possible, which is derived from the correct regression line).

Try it.

In addition to being entertaining (statistics professors don’t get out much), the exercise will give you a good intuitive feel for the principles that underly the concept of least squares estimation in regression analysis.

C. Variance Unexplained

It should be clear to you that the vertical difference between the regression line and a particular data point is “unexplained variance in income.” More specifically, it is unexplained variation after education is taken into account.

In Figure 3, Consider the individual with 7 years of schooling: The regression line predicts that he will have an income of $150. He actually earns $200. Hence, the error is +50. This variance is unexplained because it departs from the value predicted by the regression line – i.e., it is unaccounted for by years of school. It should be obvious that the farther the points from the regression line, the greater the amount of unexplained variance.

If we calculate the unexplained variance for every data point, square this residual, and then sum all of the values, we would have an estimate of the total amount of unexplained variance. In this case, the value is 10,733.28.
By now it should be evident that a straight line can be defined by three values: You can draw the line if you know (1) where it crosses the Y-axis (call the value “a”), if you know the slope of the line (b), and if you know the level of education (x). These are the basic elements of the General Linear Model.

\[ y = a + b(x) \]

where:

- \( y \) = the predicted amount of income (dependent variable).
- \( a \) = constant or intercept (where the line crosses the Y axis).
- \( b \) = slope of the line (called the “b” coefficient).
- \( x \) = value of the independent variable (in this case, years of school for individual i).
The equation *predicts* the amount of income associated with a particular level of education. The prediction is based on the assumption that the relationship between education and income is linear (hence the term “linear regression”).

Exercise 3: The GLM: \( y = a + bx \)

Suppose that “a” = 2 and “b” = 3. Hence \( y = 2 + 3(x) \).

- If education (x) is 0, then \( y = 2 + 3(0) \), and the predicted income is 2.
- If education (x) is 1, then \( y = 2 + 3(1) \), and the predicted income is 5.

- If education (x) is 2, then predicted income is _____.
- If education (x) is 3, then predicted income is _____.
- If education (x) is 12, then predicted income is _____.

E. OLS Regression Procedure

MS Excel and a number of different statistical software programs allow you to conduct an OLS regression analysis. This handout does not go into those procedures. For the data shown in Figure 1 ( & 3), the intercept (a) and the regression coefficient (b) from an OLS regression analysis are:

\[
\begin{align*}
a &= 20.379 \\
b &= 18.531
\end{align*}
\]

The Ordinary Least Squares Regression equation is therefore:

\[
Y = a + b(X_1)
\]

or

\[
Y = 20.370 + 18.531 (X_1)
\]

To present these findings in a research paper, the table design should look like Table 1 below.

---

2 Don’t let this terminology scare you. Keep in mind that the regression lines that you have drawn in the exercises and when you were logged on to the interactive website can be thought of as predictions.
Table 1
Income Regressed on Years of School Completed
(unstandardized OLS coefficient)

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>20.38</td>
</tr>
<tr>
<td>Years of School</td>
<td>18.53**</td>
</tr>
</tbody>
</table>

\[ R^2 \]  
N=12  
.821

** Statistical significance (P) is .001 or less.

**Interpretation**

The results in Table 1 show that the relationship between education and income is positive and statistically significant (equal to .05 or less). The chances of finding this relationship by chance is less than .001. Each additional year of schooling is associated with an increase in income of $18.53.

Keep the following in mind:

*The b coefficient represents the amount of change in the dependent variable (income) that is associated with a unit change in the independent variable (education).*
Exercise 4 is designed to emphasize the relationships that have been discussed. If you are unclear about any of the problems below, please raise the issue to the instructor.

**Exercise 4: \( y = a + bx \)**

Statistics: \( a = 20.38 \quad b = 18.53 \)

1. If education (x) is 0, then predicted income is _________.
2. If education (x) is 1, then predicted income is _________.
3. If education (x) is 7, then predicted income is _________.

4. What is the difference (error) between the predicted value and the actual income for the individual with 7 years of schooling? _________.

5. If education (x) is 8.5, then predicted income is _________.
   (Note: This interpolates between values that are not in the data.)

6. If education (x) is 15, then predicted income is _________.
   (Note: This extrapolates to 15, which is outside the range of the data in the sample. Is this extrapolation valid?)

**Part II: Variance Explained: Estimating the Strength of a Relationship**

A. **Strength of a Relationship: \( R^2 \)**

The question we have not yet answered is: “How strong is the relationship between yrsch1 and income?”

The answer is given by the \( R^2 \) (called the “coefficient of determination”). The \( R^2 \) varies between 1.00 (a perfect association) and 0 (no association). In this particular case, the \( R^2 \) is .821 (shown at the foot of Table 1).
We can interpret an R\(^2\) of .8206 as the **percent of the variance in the dependent variable (income) that is explained by the independent variable(s)** (in this case, by yrschl). Another way to say this is: “Years of school explains 82 percent of the variance in income.”

A value of .82 is a very high coefficient of determination. It means that we have a strong model (strong relationship).

The R\(^2\) is one of the most important measures used in regression analysis. Knowing how to calculate R\(^2\) is the best way to fully understand the measure.

**B. Estimating R\(^2\)**

The regression analyses we carried out enabled us to conclude that “Yrschl explains 82 % of the variance in income.” In order to make the statement that “yrschl accounted for a certain proportion of variation,” it is evident that we would have had to know the total amount of variance in the model.\(^3\)

To come up with an estimate of total variation we calculate the variation in the model assuming that we have no information on the respondents’ level of education. We can then compare this to the variation when we do have education in the model.

**Estimating Total Variation**

Suppose that the only information that we have at hand is the average income for the sample. In this situation – i.e., in the absence of any additional information for each person – your best estimate of the income earned for every individual is the mean income for the entire sample. For example, imagine if you had all 12 people sitting in front of you in a room, and you are asked to guess each one’s income. Under these circumstances, the best guess in each case would be the average for the group.

\(^3\) By now this kind of reasoning should be familiar to you. It is the same logic used in ANOVA (Analysis of Variance) (i.e., t-tests or means tables).
In our data, the mean income is 140.8 (see foot of Table 1). We can represent that estimate as a flat, straight line in Figure 4.

Figure 4

It is evident that the errors are large. In fact, by simple visual inspection, it is evident that the errors here are much larger than the errors in Figure 3. It should also be obvious that – just as we did in Section C, Part I – we can calculate the amount of unexplained variation in the model.

Again, consider the individual with 7 years of schooling (the same individual that was our focus before). The line predicts that he will have an income of $140.1. He actually earns $200. Hence, the error is +59.9. (When we knew his education, in Figure 3, the error of the estimate was lower, +50.) The variance is unexplained because it departs from the value predicted by mean income for the group.

If we perform this operation for every data point, square each value, and then sum all of the values, we would have an estimate of the total amount of unexplained
variation *in the model that does not include yrschl*. In this case, the value is 49,108.39.  

We are now in a position to calculate $R^2$, based on the following relationships:

\[
\text{Total variation} = \text{Unexplained variation} + \text{Explained variation}
\]

In this case:
\[
59,841.67 = 10,733.27 + \text{Explained variation}
\]

By subtraction, it follows that explained variation = 49,108.4

This represents **82.06 % of total variation** since:
\[
R^2 = \frac{\text{Explained Variation}}{\text{Total Variation}} = \frac{49,108.4}{59,841.67}
\]

\[
R^2 = .8206
\]

All of these relationships can be visually represented, as shown on the next page.

---

4 MS Excel output uses somewhat different terminology. MS Excel refers to explained variation as “Regression SS (Sum of Squares).” MS Excel refers to unexplained variation as “Residual SS (Sum of Squares)” and total variation as “Total SS (Sum of Squares).” In this handout, we prefer explained/unexplained variation because these terms better convey the two ideas.
This diagram combines Figures 3 and 4. For clarity, all data points have been removed except one: the individual with 10 years of education and an income of $230. The income predicted by the regression line is $205. Mean income is $148.

This is the amount of income that is predicted by the regression line ($205). Note that the prediction is much improved compared to the prediction based on average income. Hence, knowing yrschl reduces the error of the estimate of income.

This distance reflects the variance that is unexplained (error) by yrschl. Unexplained + explained variation = total variation.

This is the amount of income that is predicted when the only information you have is the average income from the group. Clearly there is a large ‘distance” between this value and the individual’s actual income.

This distance represents the amount of income “explained” by the regression line (i.e., by knowing yrschl). It is the improvement of the estimate that was based on mean income alone. A measure of the improvement is R2 (explained/total variation).
C. Note on Error Reduction and the Concept of “Explanation”

It should be evident that \( R^2 \) measures improvement in our prediction (alternatively, the reduction in error).

Keep in mind that, in this context, the concept of “explanation” has a precise meaning. In contrast to common usage, when one says “education explains variance in income,” the statement refers to the covariation of education and income, and to the improvement in prediction (reduction in error) when education is taken into account in estimating a person’s income.

A question that arises at this point is “What could account for the 17.94 % of the variation that remains unexplained?

This variation is probably accounted for by other variables that are associated with income but that are not in the equation, such as gender, age, rural/urban residence, occupation, industry, and so on. If you include these variables in the equation, and if they explain additional variance in income, then the \( R^2 \) will increase.

If your objective is to find the most complete model of income determination – i.e., if you objective is to explain the most variance possible – then you can keep adding to the equation variables that increase the \( R^2 \) until you run out of variables in your data set, or until the inclusion of additional variables no longer adds to variance explained (\( R^2 \)).

However, if your objective is to test a particular theory, then your strategy would be different. Instead of throwing every variable into the equation you can think of, you would include only those that are relevant to your hypothesis.
Logical Argumentation

Once the researcher completes their qualitative, comparative or quantitative analysis, they must then prepare their oral or written report. The report must provide an argument on the findings of the analysis. The recommended format for preparing the report is using logical argumentation, which allows the researcher to present their analytic results by combining logic, reasoning and information (data, facts, evidence, etc.).

Figure 12 provides the framework for preparing an argument map used in outlining your logical argument. The argument starts with the contention (findings, conclusions, thesis, etc.), which is the results of your analyses. In security analysis placing the contention first is often called the bottom line up front (BLUF). The contention is then supported using a synthesis of reasons and objections, which come from a combination of your literature search, data collection and analysis. Reasons may be supported with information or logic and reasoning structures, in addition to addressing any objections to the reason. Objections may also be supported with information reasons, and must also include rebuttals.

A good logical argument addresses a series of reasons and objections (i.e., it is not limited to one reason and one objection as shown in Figure 12). Depending on your research tasking, specific research question and the audience for your oral or written report, you will probably need a series of contentions to address each of your research hypotheses or alternatives. Figure 13 provides an example of a logical argument.

**Figure 12. Argument Map**

- **Contention**: The main issue or topic under consideration.
- **Reason**: Information which directly supports the contention.
- **Objection**: Information which directly refutes the contention.
- **Rebuttal**: Information which provides a counter.
Figure 13. Example Argument Map

Voting should be compulsory.

Compulsory voting ensures that the Government is representative.
A large majority of the voting population will vote when it is compulsory.
Everyone does not have to vote for the Government to be called representative.
Political parties do not have to waste money on persuading people to turn up to the voting booth.
With compulsory voting people will get fined if they don't turn up to the voting booth.
Compulsory voting is an infringement of democratic principle.
Citizens living in a democracy have the right and the responsibility to vote.
People living in a democracy should have a voice in how the Government makes decisions.

Note: The above example argument map addresses the specific research question of “Should voting be compulsory?” This example came from an Australian source. In Australia, voting is compulsory.

Writing Your Findings

The write-up of your findings will detail the reasons and objections supporting your contention. You should include tables, figures, etc., which support your arguments. You can also call on the range of methods from literature composition to outline your arguments and present your data. Quotes from interviews and focus groups, descriptive statistical tables, excerpts from your fieldnotes, etc., are all elements you can use to build the argument narrative supporting your contentions.

Also make sure to include and attempt to explain in your narrative analysis any anomalies in your data. The findings should also include a statement (even if not quantified) of the uncertainty (possible biases) in the analytic results (i.e., uncertainty in the ability to infer (generalize) to the larger population).
Logic Fallacies

Logic fallacies entail errors in using logic and reasoning to support a logical argument. Logic fallacies are common in a large portion of human oral and written communications, but they tend to be rampant in media stories (especially editorials), marketing and political discourse, and in other situations where individuals are trying to convince you of the correctness of their point of view or perspective. The material below is modified from Bluedorn & Bluedorn (2003) and provides a short description of the most common logic fallacies.

**Fallacies: Avoiding the Question.**

*Red Herring*—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.

*Ad Hominem Attack* (personal attack)—attacking an opponent’s character, or their motives for believing something, instead of disproving their argument.

*Genetic Fallacy*—condeming an argument because of where it began, how it began or who began it.

*Tu Quoque* (You Too)—dismissing someone’s viewpoint on an issue because they were inconsistent on the very same thing in the past.

*Faulty Appeal to Authority*—Appealing to the authority of someone who has no special knowledge in the area they are discussing.

*Appeal to the People*—claiming a viewpoint is correct just because many other people agree with it.

**Fallacies: Making Assumptions.**

*Circular Reasoning*—attempting to provide a conclusion by simply restating it. Someone says P is true because Q is true, and Q is true because P is true.

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

*Loaded Question*—asking one question which assumes the answer to a second question.

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

*Whole-to-Part*—asserting that what is true of something as a whole must also be true of each of its parts.
*Either-Or*—asserting that we must chose between only two things, when in fact there are a number of different alternatives.

*Slippery Slope*—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.

**Fallacies: Misusing Statistics.**

*Hasty Generalization*—generalizing about a class or group based upon a small and poor sample.

*Weak Analogy*—claiming that some items which have only a few minor similarities are practically the same in almost everything else.

*Post hoc ergo propter hoc*—assuming that since A happened before B, A must have caused B.

*Proof by lack of evidence*—claiming something is true simply because nobody has yet given any evidence to the contrary.

**Fallacies: Propoganda.**

*Strawman*—distorting the opponent’s point of view or stance on an issue to make it easier to attack and disprove their arguments—thus the attack is really on a point of view or stance that does not exist.

*Appeal to Fear*—moving you to fear the consequences of not doing what the person wants.

*Appeal to Pity*—Urging someone to do something only because they pity us or they pity something associated with us.

*Bandwagon*—pressuring someone to do something just because many other people are doing it.

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

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

*Transfer*—attempting to get someone to associate their good or bad feelings about one thing to another unrelated thing.
**Snob Appeal**—encouraging someone to think that our product would make them better than or stand out from everybody else.

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

**Appeal to Hi-tech**—urging someone to buy something because it is the “latest thing”—but not necessarily because it is the best thing.
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 11 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

Additional Intellectual Standards (from Nosich, 2012)

Is the research, analysis and communication:
• Reasonable?
• Consistent?
• Falsifiable?
• Rational?
• Testable?
• Well Organized?
• Authenticated?
• Effective?
• Factual?
### Table 11. Analysis and Writing Rubric

<table>
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<th>Interpolation between categories may be used.</th>
<th>Advanced Thinker</th>
<th>Practicing Thinker</th>
<th>Beginning Thinker</th>
<th>Notes</th>
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<tr>
<td><strong>1. Introduction: Purpose, Goal, Question, Problem, Issue (includes the Abstract or Executive Summary)</strong></td>
<td>Paper/essay precisely focused. <strong>Intellectual Standards:</strong> Purposes, goals, questions, problems, and/or issues clearly stated, relevant, realistic and/or significant. Related purposes and questions articulated and explicitly distinguished. <strong>Research Standards:</strong> Research questions and/or Statement of the Problem properly formatted. When appropriate, clear thesis statement or findings provided.</td>
<td>Paper/essay somewhat focused. <strong>Intellectual Standards:</strong> 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. <strong>Research Standards:</strong> Research questions or Statement of the Problem formatting has/have minor problems. When appropriate, thesis statement/findings not clearly stated.</td>
<td>Paper/essay not focused. <strong>Intellectual Standards:</strong> Purposes, goals, questions, problems, and/or issues not clearly stated, relevant, realistic and significant. Related purposes and questions not articulated and explicitly distinguished. <strong>Research Standards:</strong> Research questions or Statement of the Problem not properly formatted. When appropriate, thesis statement or findings missing.</td>
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<tr>
<td><strong>2. Information Literacy Skills: Information, Data, Evidence, Context</strong></td>
<td>Evident mastery of relevant information. <strong>Intellectual Standards:</strong> Data, information, and/or evidence clear, accurate, and relevant. Information both supporting and contrary to main argument, findings, or conclusions collected and understood. <strong>Research Standards:</strong> 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.</td>
<td>Problems understanding relevant information. <strong>Intellectual Standards:</strong> 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. <strong>Research Standards:</strong> 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.</td>
<td>Weak understanding of relevant information. <strong>Intellectual Standards:</strong> 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. <strong>Research Standards:</strong> 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.</td>
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<td><strong>3. Conceptualization Skills: Assumptions, Concepts, Ideas, Points of View, Frame of Reference, Alternatives</strong></td>
<td>Strong conceptualization. <strong>Intellectual Standards:</strong> 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. <strong>Research Standards:</strong> Appropriate logic, reasoning, existing theories, and/or models presented. Clear list of alternatives, hypotheses, and/or evaluative criteria presented.</td>
<td>Limited conceptualization. <strong>Intellectual Standards:</strong> 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. <strong>Research Standards:</strong> Appropriate logic, reasoning, existing theories, and/or models not always presented. Clear list of alternatives, hypotheses, and/or evaluative criteria not always presented.</td>
<td>Little to no conceptualization. <strong>Intellectual Standards:</strong> 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. <strong>Research Standards:</strong> Appropriate logic, reasoning, existing theories, and/or models not presented. Clear list of alternatives, hypotheses, and/or evaluative criteria not presented.</td>
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| **4. Analysis Skills:**  
Inferences, Interpretations, Implications, Consequences | Strong use of analytic methods.  
**Intellectual Standards:** 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.  
**Research Standards:** Correct use of analytic methods evident. Reliability and validity of findings ensured. | Limited use of analytic methods.  
**Intellectual Standards:** 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.  
**Research Standards:** Limited or incorrect use of analytic methods. Minor problems exist with reliability and/or validity of findings. | Little or no analytic methods employed.  
**Intellectual Standards:** 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.  
**Research Standards:** No use of analytic methods. Primary use of opinion evident. Does not ensure reliability and validity of findings. |
| **5. Writing Skills** | Correct formatting and writing/citation style (APA).  
**Research Standards:** 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. | Errors in formatting and writing/citation style (APA).  
**Research Standards:** 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. | Numerous errors in formatting and writing/citation style (APA).  
**Research Standards:** 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. |
| **COMMENTS:** | | | |
Getting an A on Your Research Project

Note: This section is written as guidance for writing an academic (social science) paper. However, it also provides insights to other types of research papers.

Page numbers shown by sections are only estimates—see the specific guidance from your instructor on recommended page numbers—quality of work is normally more important than numbers of pages.

While it is true that there is no one proper format for writing a literature review or a social science research paper, there are formats that are more correct than others. Since you are budding (vice accomplished) social scientists, in my courses I mandate that you follow a single simple format for the research assignments. This required format follows exactly with the steps in the critical thinking (wheel of social science) framework that you learn in this manuscript. The format described in this section is what I look for when grading your final papers. This is the same format I use when writing my social science papers. All page lengths mentioned below refer to double-spaced, 12 font (Times New Roman), with 1 inch margins on all sides.

We realize that for many of you the transition from having done mainly research using the historical (inductive) approach your entire lives to our now having you learn the deductive (systematic) approach is often a struggle. Still, being able to: (1) draft good research questions, (2) summarize the existing knowledge on your specific research question, and (3) develop a theoretical framework to generate hypotheses offering to answer the specific research question, (4) using one of the many systematic analytical methods to test your hypotheses, and (5) developing a logical argument to present your findings, are all skills that deductive researchers must master.

Title Pages and Abstracts—see the APA Publication Manual for proper formats and content. Remember that the abstract (often called the executive summary in security studies) is the only part of your study that busy supervisors will read. Thus, as a minimum the abstract (executive summary) must include the research question and a summary of your findings. Putting a summary of the research findings in the abstract (executive summary) is called putting the Bottom Line Up Front (BLUF). The abstract must be no longer than 1 page.

Introductory Section (1-2 pages)

Note: APA does not use the sub-title “Introduction” in its paper format. Instead the first page of the paper narrative centers the paper long title as a sub-heading. The 1-2 pages after the centered paper long title then provide the introductory material for the study.

Provide your general and specific research questions and sufficient background and contextual material to convince the reader of the value of your conducting this study. A good strategy for developing this section is to start with a discussion of the larger or general problem or issue and then work toward the more detailed specific research question that will actually be investigated in your research project.
Specific Research Question: The actual question the study will try to answer. In social science, we normally want to explain or predict some human behavior, human condition, or human process—the specific question must be worded to reflect whether you will conduct an explanatory or predictive study. Thus the specific question will ask a “why” for explanatory studies or “what will happen” for predictive studies. (Descriptive studies that answer who, what, when, where, and how questions are not normally allowed in my courses.)

Background and Contextual Material: Don’t try to tell the entire story in your introductory section. Provide just enough background and contextual material to convince the reader why this topic should be studied, and to set the stage for the rest of the paper. The summary of your research findings do not go in the introductory section, but instead are in the Abstract (executive summary) and in the later Findings section of the paper.

Warning: Students most often leave out the research question or try to provide too much background/contextual material in the introductory section—cut it off at 2 pages (and even 2 pages is probably too long). Another common mistake is that students try to introduce too many research questions. The rule for new social scientists (for my students anyway) is to address one specific research question in one paper. Don’t try to save the world or address all the world’s problems in just one paper—keep it simple with one specific research question. Also—do not use rhetorical or hypothetical questions in your writing to try and make points or dramatize the text—those literary techniques might have been good in English Composition 101 but are not acceptable in formal social science studies.

Remember: Don’t make the introductory section too long. Keep all the background and historical stuff out of this section unless it is directly related to helping the reader understand why we should study this topic. Remember that all you need in this section is a clear statement of the specific research question and enough background material to justify why this study is needed.

**Literature Review (5-7 pages)**

Officially, this section presents the current status of our knowledge on your specific research question, it does this by reviewing and critiquing the works of other researchers who have tried to answer the same or similar specific research questions including identifying the theoretical frameworks or models others have used in their studies. However, in reality this section does a whole lot more than this.

Things I specifically look for in the Literature Review section:

Identification of the literature involved (there are lots of them and students often use the wrong one for their specific research question).

A general critique of the overall literature—this is usually 1 or 2 paragraphs that reviews or provides a “snapshot” of the status of the entire body of literature on your specific research question.
A review of the most important individual studies you found in your literature search—these can range from a paragraph or two on each work cited or if several works provide similar findings they can all be summarized in one or two paragraphs. At a minimum, you should identify the findings of the other researchers, what theoretical framework or model and research designs they employed, and then discuss/critique their research designs and any biases or limitations in their study. You should also discuss the importance of each work to the overall literature on the question.

Remember  The purpose of the Literature Review section is to review what other authors have offered as an answer for your specific research question (i.e., it summarizes the existing knowledge on the specific research question). This section should start with a paragraph or two which summarizes the general state of the literature on your specific research question. Then, summarize and critique the individual works, but avoid wandering all over the place with peripheral material if it does not deal directly with providing an answer to your specific research question.

Do not write a Literature Review in what I call the "passive mode"--where you wait until later in your summary/critique of each individual work to state the author's findings on your specific research question. I recommend you start each paragraph where you introduce a new work with something like: "Jones (1995) argues. ...(then give his/her direct or implied finding to your specific research question)...." Then follow this "active statement" with the rest of the summary and critique of each work.

Here is more of an example of what a summary/critique of an individual work should contain:

Smith (2006) offers…then present the researcher’s direct or implied findings related to your specific research question…. Next discuss how the author came to his or her findings--things to discuss include: (1) type of paper (scholarly social science, scholarly historical, journalistic, policy-related, etc.); (2) theory, model, logic, or reasoning used in the study (if any—it may be a historical or journalistic work using only intuitive analysis—if this is the case say so); (3) data collection methods (if pertinent), (4) data analysis method (probably intuitive if there is no noticeable systematic methods in evidence); and (5) any biases and limitations to the study (here you may have a lot to say as many writers have very biased views of why things happen—see later material in this handout on evaluating biases in scholarly works).

After presenting the above basic material on each work, then you can proceed to discuss insights or provide other discussion that demonstrates to the reader the importance of this work in understanding the current state of our knowledge on your specific research question.

Organize the literature review for individual course papers as follows:

Summary of Literature (2-3 paragraphs)
Work 1 summary-critique (2-3 paragraphs)
Work 2 summary-critique (2-3 paragraphs)
Work 3 summary-critique (2-3 paragraphs)
Work 4 summary-critique (2-3 paragraphs)
etc., etc.

The literature review section needs no conclusion--just a good transition into the Theoretical Framework section (if developed separately). A discussion of the gaps in the literature may be included either at the end of the Literature Review section or at the start of the Theoretical Framework section.

Note: Do not use Wikipedia as a source in any course assignment. Even the Wikipedia owners recognize there are no validity checks on anything in their database. I also recommend not using any general reference materials (encyclopedias, etc.) as a source in your assignments—except maybe Webster's for an occasional definition.

Theoretical Framework (3-5 pages)

The Theoretical Framework section develops the theory or models that you will use in your study. Remember that social science is a combination of rationalism and empiricism—the rationalism (or theory) for the study is provided in this section—the empiricism kicks in with the following Research Design and Findings sections. Another purpose of the Theoretical Framework section is to link your specific research question to the gaps in our knowledge identified in your Literature Review section and to provide the rationalism (theory) which will generate the hypothesis(es) for the study which will answer your specific research question. The theoretical framework part provides this linkage by building your causal model.

The Theoretical Framework section should start with a summary—one or two paragraphs—of the gaps in the literature as you can identify from your Literature Review. These are the gaps your study should then try to fill. Note: Some researchers place this gaps discussion at the end of the Literature Review—in my courses I prefer it start the Theoretical Framework section.

Assessing Gaps in the Literature: Gaps in the literature can come from a number of sources:

1. One of the most common gaps (dealing with type of research design) is that all the literature has come from the historical approach and the gap is that there are no social science studies. In this case it is then OK to take hypotheses offered by the historical researchers and retest them using social science methodologies.

2. You may at times find a case so well studied that you really have to get down in the weeds to find the gaps. You may have to compare independent variables included in very similar models to see if the gap might be where one variable was used incorrectly, or see if a gap exists because all the literature is from one type of research (qualitative, etc.), or that only one type of data collection or analytic method has been used. The point being the gaps in the literature can originate at any step around the wheel of social science.

Once you have summarized the gaps in the literature then you should then develop the theory or model that you will use in your study and provide a justification for why you picked it (i.e. how will it help fill gaps in the existing literature).
Provide in the Theoretical Framework section a summary discussion of your selected theory or model down to the level of addressing each variable or proposition in your causal model. Discuss where the variable or proposition come from (what study, what theory, or from researcher logic and reasoning).

The Theoretical Framework section should also provide a diagram of your causal model. Specifically:

**For Simple Causal Models:** New social scientists tend to work with simple structural causal models. In my courses where structural models are called for, try to limit your work to a causal model with one dependent variable and 4-6 independent variables. Try to stay away from using intervening or antecedent variables in your causal model (unless you are on about your tenth research methods course you have not learned the statistical analysis procedures to handle complex causal models with multiple dependent variables plus antecedent and intervening variables). Remember that one goal of social science is to achieve “parsimony” or to find the least number of independent variables that do the most explaining of variance in the dependent variable—so make good use of the KISS principle. The diagram for a simple structural causal model could look something like:

```
   X1
   X2
   X3
   X4
   Y1
```

Immediately following the Theoretical Framework section should state the hypotheses for your study. Hypotheses are always written in terms of how a change or condition in one or more independent variables causes a change or condition in a dependent variable. A good check is to see if the hypothesis(es) answer your specific research question—if they do not, your study has already gone awry somewhere. Hypotheses are written in one sentence—sometimes long ones. For hypotheses from structural causal models, you can use one hypothesis for each independent variable or you can include several independent variables in the same hypothesis—I leave it up to the student to pick the format, just make sure the hypothesis(es) are understandable. Remember to make sure the dependent variable is stated the same in both the specific research question and in each hypothesis.

Sample hypotheses include:

First example (multiple independent variables in one hypothesis—acceptable but confusing):

Specific Research Question: Will Iran and Iraq likely go to war?
Hypothesis: Iran and Iraq are likely to go to war based on their shared border (contiguity), Iran’s increase in their military capabilities, both states not being democratic, both states not having advanced economies, and the historical enduring rivalry between the two states.

Second example (only one independent variable in each hypothesis—preferred approach):

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.

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

Hypothesis 4: Iran and Iraq are likely to go to war based on both states not having advanced economies.

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

Theoretical Framework sections are fairly easy to develop. In most papers employing structural causal models, it includes:

a. Start with a summary paragraph or two on the gaps in the literature.
b. Next identify and justify the theory or model you selected for your study.
c. Then in several paragraphs explain your theory or model’s sources, major assumptions (if from one theoretical approach, and the individual variables and theoretical propositions that will come to play in your study. Note: There is no need to even mention your case or facts from your case or trying to relate your case to the theory or models as part of this summary.
d. Finally end the section with your hypotheses

Organize the Theoretical Framework section as follows:

- Introduction discussing gaps in the literature, how this study will help fill some of those gaps, and justification for theory or model to be used in study.
- Summary of the theory or model to be used in the study, including a discussion of each variable and its source/logic, plus a diagram of the model if appropriate.
- Statement of hypotheses to be tested.

Final Warning: There are many ways that students falter in developing Literature Review and Theoretical Framework sections. The biggest mistake students make here is that they just keep giving pages and pages of background and contextual material and never summarize the literature or build their theoretical framework—don’t—this is not a history or
journalism course. Limit the background and context material to the Introduction—and if it does not fit here either leave it out or use it as part of the later introduction paragraphs in your Case Study/Findings section. Another big mistake is to assume a standalone Literature Review/Theoretical Framework assignment is just a regular term paper, complete with a Conclusion—it is not, not even close. The Literature Review section is a discussion of the state of the knowledge on your specific research question, which is then followed by the Theoretical Framework section that builds the theory/model you are using in your study and shows where it came from. Another common mistake, especially for those doing qualitative case studies, is to present all the data (facts) or empirical works they found on their study in the Literature Review—it does not go here. Finally, extremely weak Literature Review sections are usually the result of students finding in their literature search only descriptive studies of their paper topic and not finding studies that focus on the theories or intuitive findings that attempt to explain the human behavior, human condition, or human process under study. If your Theoretical Framework section does not end with a structural causal model with hypotheses, and if from the narrative of the Theoretical Framework I cannot figure out where the variables in your structural causal model came from and why they are there—then your paper is already in trouble.

A Note on Theory: Do not be afraid of theory. It is nothing more than a set of propositions that explain the relationships between variables as they affect a human behavior, decisions or conditions. There are a multitude of ways to address theory in the Theoretical Framework section of your paper. One way is to pick the exact same theory and causal model used by another researcher and conduct another study using a similar research design. This is really not recommended as it adds little to our knowledge. A better approach is to take the theory and causal model used by another researcher and critique it so that you either find a problem with their research design that you can correct in your study, or find a different variable or missing step that the original researcher overlooked that adds to our knowledge. In other words, doing the same study as someone else adds nothing to our knowledge base—instead you have to try and change the previous researcher’s study to make it better.

**Research Design (3-5 pages)**

The Research Design section develops how you will test the hypothesis(es) in your study. It is also not a bad idea here to identify the type of empirical study—qualitative, comparative, or quantitative—that you are conducting. It is this research design section that determines which of those types you will use. Other issues to address in this section:

1. Operationalize Variables: For structural causal models provide an operationalization of all variables in the causal model. Remember that all variables in a causal model can be measured as nominal, ordinal, interval, or ratio. Describe how you will measure each of your variables in your causal model(s) as one of those types (nominal, ordinal, interval, or ratio). If you are conducting a survey where you have used scales or indexes, then you can include a copy of your survey as an appendix to the study and the individual questions on the survey provide the operationalization of your variables in the causal model.
2. **Sampling Plan:** Identify the population for your study and describe the method used for taking your case sample and any limitations that this sampling methods places on the generalizability of your study. For qualitative case studies discuss why you picked the cases you did based on the important characteristics of the variables, processes, or case(s).

3. **Data Collection Methods:** Explain how you collected (will collect) the data for your study.

4. **Analysis Procedures:** Provide a short description of the procedures used in conducting your analysis. For qualitative case studies be specific as you can on how you carried out your pattern-matching or other analysis technique.

5. **Limitations and Biases in your Study:** Describe what limitations this particular research design places on the study of your specific research question. Describe biases (problems in operationalizing variables, sampling, data collection instruments, analysis techniques, etc.) that may affect the reliability or validity of your study. It is assumed that you as the researcher are neutral in your study—so it is not necessary to discuss your personal biases toward the study or toward research in general. When discussing biases you should always address: (1) the source of the bias(es), (2) the direction and magnitude of the bias(es), and (3) how the bias(es) might affect the study’s hypothesis(es) tests.

**Warning:** Most students leave out one of more of the above important sub-sections from their paper’s Research Design section. Many also do not provide sufficient details in the sub-sections such that another researcher can assess the validity of the research. Each of these sub-sections is equally important no matter what type of study—qualitative, comparative, or quantitative—that the research design develops.

**Findings (3-5 or more pages)**

For those of you who really think there is historical background information the reader needs to know about your case study, do not just try to force it into the introductory section, Literature Review, or Theoretical Framework sections. Instead, the most important historical material that you really think the reader needs to know can be used as the introductory paragraphs to the final paper Findings section—but keep this information to a minimum (2-3 pages maximum).

This is where you present the logic, reasoning and information in your hypothesis(es) tests using a logical argumentation approach. The proper wording is that you either accept or reject a hypothesis (used mainly in quantitative studies) or your data and analysis supports or does not support your hypothesis. Any other terminology is probably wrong.

**Note:** I leave it up to the student as to whether they want to place graphs, charts, tables, figures, etc., in the main body of the paper (at the next paragraph break after they are first mentioned if possible) or place them in an appendix.
Qualitative Case Studies: Present the data needed to support your analysis process leading to your hypothesis tests. Most of you will be doing a form of pattern-matching (meaning you attempt to fit the data collected into the pattern of the causal model/hypothesis(es)). Use narrative statements of facts, descriptive statistics, matrixes, quotes, figures, tables, graphs, etc., that provide the evidence for the hypothesis) test(s). In all cases use a logical argumentation narrative format to walk the reader through your analysis including any tables or figures so they can judge for themselves if the hypothesis(es) are supported or not.

Warning: Students who conduct qualitative case studies have the hardest problems with this section. From their previous research experience, students find themselves yearning to tell the entire “story” behind their case—especially if it is a historical case. Resist this yearning. When analyzing a historical case, in your paper’s introduction give enough contextual and background material to set the stage for your case study (but still limit yourself to 1-2 pages of introduction at most). In the Literature Review section provide only enough facts on the case so that the reader will understand the theoretical points you are trying to make—but avoid going into a long-winded narrative story of your case in the literature review. Finally, once you have hypotheses to test—use the Findings section to present enough of the facts in the case so that you can convince the reader whether the hypotheses are supported or not. But even still, keep peripheral material out of your case study unless it bears directly on the hypothesis tests or on the reader’s understanding your analysis.

A general expected format for structuring the Findings section includes:

**Start of expected format:**

Introductory paragraphs with background/empirical data the reader should know.

Hypotheses 1 (restate in full). (this is the logical argumentation Contention)

Logical argument providing support or non-support of hypothesis 1.

End with a statement on whether the analysis supports or does not support hypothesis 1--then add any additional insights from your analysis of this hypothesis.

Note: It is fully acceptable for you to not support a hypothesis as this is a finding that tells us in your next study of the same topic you will have to adjust your theoretical framework of develop a different research design.

Hypotheses 2 (if needed) (this is another logical argumentation Contention)

Logical argument providing support or non-support of hypothesis 2.

End with a statement on whether the analysis supports or does not support hypothesis 2--then add any additional insights from your analysis of this hypothesis
Hypothesis 3, 4, etc…… (as needed)

If more than one hypothesis is tested, include a final summary findings paragraph where you summarize how the hypothesis tests support your causal model. Sometimes you may also need to state which hypothesis (assuming more than one was supported) is most compelling and justification for why you selected it as most compelling.

End of expected format.

Warning: The biggest mistakes students make are in not following a systematic analysis procedure in testing their hypotheses—pros-cons-fixes, matrix analysis, descriptive statistics or inferential statistics provide this systematic analysis. A number of other qualitative, comparative, or quantitative analysis methods may also be used in this section, depending on your study’s research question and research design. Another common mistake is when lacking data to measure a variable, the student will insert their own opinions—social science research has no place for personal opinions or statements like “I believe,” “In my opinion,” or “Everyone knows.” A third major mistake is to not make a finding as to whether your analysis has supported your hypotheses or not—hard to believe when in fact the hypothesis test is the whole reason for conducting the analysis.

Conclusion/Recommendations (1-2 pages)

The Conclusions/Recommendations section of your paper address the critical thinking element of implications/consequences.

In most social science explanatory or predictive studies there is no need to develop recommendations—just present the knowledge created by your research effort. If your original specific research question concerns solving a problem or developing policy recommendations, then including these recommendations in your conclusion is appropriate.

There are three things that must go in every good conclusion if your study is an explanatory or predictive study:

1. Discuss what this study's findings means to the larger academic discipline or to the larger society. This discussion should usually be tied to your original research question or puzzle.

2. Revisit the study’s original theory or causal model and discuss what this study has added to our knowledge of the theory or model—i.e., are there possible changes to the theoretical propositions or model that this study has unveiled? Explain the implications and consequences of your findings.

3. Discuss how if this research project leads to the next step or next level as part of a larger research program (i.e., to further add to our knowledge on the subject)—what changes would you make to carry out your next research project on the topic (e.g., revisions to research questions, different cases, changes in theory/causal models, different research design, different data collection of analysis, etc.).
Warning: Do not just repeat your findings in the conclusion. The findings from your hypothesis tests should have all been covered in the Findings section.

References

For undergraduate research projects, an average of 1 ½ to 2 references per page of narrative text is a good number. For graduate research projects 2-3 references per page is a good number. When a research paper appears off-track, I will look at the references to try and figure out what went wrong.

Make sure you cite your sources properly to avoid all suspicions of plagiarism. For all literature review and final paper assignments, you must use a formal citation style. APA is the required formal citations style for all written assignments in the EKU College of Justice and Safety. You may be directed to use a different style in courses offered by other EKU departments, but APA is the style you must use in this course. **Footnotes are not to be used in my courses.** As with any citation style, the APA citation style requires the use of page numbers for quotes, paraphrasing, or other material related to facts or the author's intellectual property used in your assignments.

**Appendixes:** Use appendixes sparingly, but do use them when needed. Examples: data collection instruments; matrix analyses; tables, graphs, figures, etc., that are not included in the main body of the paper, etc.

**Final Advice:** In your first research methods course, I don’t expect you to win a Nobel or Pulitzer Prize. Because of time and resource constraints, most of you have major sampling and data collection limitations that affect the reliability and validity of your study. That is OK. What I am looking for in this final research paper are indications that you learned the critical thinking and social science research methods material covered in this course and have developed a final paper that adds to our knowledge area on your topic.

**Good Luck with Your Research Projects**
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:**


