Criminal Profiling: Science, Logic, and Cognition

Wayne A. Petherick and Brent E. Turvey

A thousand mistakes of every description would be avoided if people did not base their conclusions upon premises furnished by others, take as established fact what is only possibility, or as a constantly recurring incident what has only been observed once.

—Hans Gross, Criminal Investigation (1968, p. 16)

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A criminal profile is a collection of inferences about the qualities of the person responsible for committing a crime or a series of crimes. This sounds basic and it is. However, definitions are required, as there has been a tendency to gloss over the basic yet complex issues this brings to our doorstep.

Let’s break it down. An inference is a particular type of conclusion based on evidence and reasoning. This is different from a speculation, which is a conclusion based on theory or conjecture without firm evidence. The job of any competent forensic examiner is to make certain that speculations are guarded against, while inferences are evidence-based, logical, and rational.

With no shortage of inferences based on a variety of methods,¹ the criminal profiling community and the literature it spawns suffer greatly from an absence of accuracy and applied understanding with respect to precisely what an inference is and how to make one without becoming lost in fallacy.

This chapter explains how valid inferences are made against the framework of criminal profiling. It requires the use of the scientific method, an applied understanding of the science of logic, and knowing how to know when you are wrong. It also requires some understanding of bias.

BIAS

Paul L. Kirk (1974, p. 4) has written, “Physical evidence cannot be wrong, it cannot be perjured, it cannot be wholly absent. Only in its interpretation can there be error” (italics added). This passage is of particular interest to all forensic examiners, because they are defined by their interpretive role with regard to the evidence. The challenge is that much of what forensic examiners confront represents ambiguous stimuli—evidence that might be interpreted in more than one way depending on a variety of subjective influences.

When asked about bias, the majority of forensic examiners, including criminal profilers, claim that they are entirely objective when performing their analyses, or that they try very hard to be. They also hold firm that their employer/agency, their emotions, and their personal beliefs have no influence over their final conclusions. To admit otherwise would be professional suicide, as objectivity and emotional detachment are prized above all other traits in the course of a forensic examination—that is, one ultimately bound for court. One could even argue that objectivity is a necessary and defining trait.

Given the professed and necessary objectivity of forensic examiners and their presumed scientific training, it could be asked how bias may yet persist in their results or inferences. This is a perfectly reasonable question. Some forensic examiners claim that it does not, and that an objective aspect combined with scientific

¹ Specific methods of criminal profiling not related to those taught in this text are described in Chapter 3, “Alternative Methods of Criminal Profiling,” with a discussion of strengths and weaknesses.
training is sufficient to cure most, if not all, ills that may infect their examinations and subsequent results. However, this is untrue because it ignores a fundamental principle of cognitive psychology—the pervasive nature of observer effects.

As cognitive psychologists have repeatedly documented, tested, and illustrated, “[T]he scientific observer is an imperfectly calibrated instrument” (Rosenthal, 1966, p. 3). Their imperfections stem from the fact that subtle forms of bias, whether conscious or unconscious, can easily contaminate their seemingly objective undertakings. Observer effects are present when the results of a forensic examination are distorted by the context and mental state of the forensic examiner to include the examiner’s subconscious expectations and desires.

Identifying and curtailing this kind of bias is a considerable task when one takes into account the forensic community’s affiliation with both law enforcement and the prosecution. Specifically, this association has fashioned an atmosphere in which an unsettling number of forensic professionals have all but abandoned objectivity and have become completely partial to the prosecution’s objectives, goals, and philosophies. They may even go so far as to regard this association as virtuous and heroic, and they may believe any alternative philosophy to be a manifestation of something that is morally bankrupt. So strong is the influence of this association between forensic evidence examination and law enforcement that some forensic examiners have even deliberately fabricated evidence or testified falsely so that the prosecution might prove its case; however, they are the extreme end of the spectrum.

It is fair to say that the majority of practitioners in the forensic community routinely acknowledge the existence of overt forms of conscious bias. That is, they generally recognize and condemn forensic ignorance, forensic fraud, and evidence fabricators when they are dragged into the light and exposed for all to see. Moreover, the forensic community seems to realize that, to effectively serve the Criminal Justice System, they must immediately eliminate individuals, procedures, or circumstances that call into question examiner objectivity and neutrality (although this may be called into question in some specific cases, when forensic science organizations essentially fail in their duty to regulate membership, thereby protecting inept and unethical examiners).

Although the forensic community is somewhat alert to the potential for extreme forms of outright fraud and overt bias, it tends to be less able to understand and accept that well-documented forms of covert bias can taint even the most impartial scientific examinations. This is disheartening for the simple reason that covert and subconscious biases represent a far greater threat to the forensic community than do the small percentage of overtly biased, dishonest, or fraudulent forensic examiners.

To grasp the elusive yet powerful nature of subconscious bias requires a brief lesson in cognitive psychology. Cognitive psychology is the psychological science that studies cognition, the mental processes that are believed to underlie behavior. The following is a well-established principle of cognitive psychology: An individual’s desires and expectations can influence his or her perceptions, observations, and interpretations of events. In other words, the results of observations are dependent on at least two things: (1) the object or circumstance being observed and (2) the observer’s state of mind. Cognitive psychologists have coined several terms to describe this phenomenon, including observer effects, context effects, and expectancy effects (Neisser, 1976; Risinger et al., 2002; Rosenthal, 1966; Saks, 2003). Readers may consider them essentially interchangeable.

There can be no doubt that observer effects exist and subconsciously influence forensic examiners. The pervasive failure of the forensic community to confront this and to design safeguards speaks volumes about what James Starrs (1991), professor of forensic science, refers to as “institutional bias” (p. 24):

Institutional bias in the forensic sciences is manifested by the policies, programs, or practices of an agency, an organization or a group, whether public or private, or any of its personnel which benefit or promote the interests of one side in a courtroom dispute, while either denying or minimizing the interests of the other side.
Currently, criminal profiling tends to be so strongly associated with law enforcement’s investigative efforts that there is no reasonable hope of disentanglement in the near future. What can be accomplished in the short term is the recognition of this form of bias and the open embrace of methods and mechanisms to blunt its effects.

SCIENCE AND THE SCIENTIFIC METHOD

Strict adherence to the scientific method is the first in a series of steps that can blunt the effects of even the most pervasive forms of bias. Unfortunately, the forensic community as a whole, including criminal profilers, remains uninformed about defining it, let alone applying it. Faigman et al. (1997, p. 47) are rather unforgiving, but honest, when observing:

The subject of the scientific method ... has been described innumerable times, in a multitude of works on manifold subjects, from elementary school textbooks to post-graduate treatises. And yet it remains a subject that is foreign to most lawyers and judges.

Thornton (1997b, p. 14) goes further and includes most forensic practitioners in the mix of those who do not understand what the scientific method is or how to apply it correctly:

Those individuals engaged in “scientific” work rarely study the scientific method. To be sure, those engaged in research are expected to pick up the scientific method somewhere along the way; for the most part scientists don’t study the implementation of the scientific method.

On the same subject, he also writes (Thornton, 1997a, p. 485):

Many, perhaps even most, forensic scientists are not just inattentive to the scientific method, but ignorant. ... I don’t believe that forensic scientists lack the wit to be able to defend their use of the scientific method, but rather that the necessity to do so has not generally been thrust upon them.

Even as this fourth edition goes to press, these insights are as accurate and useful as ever. If nothing else, they remind us that basic explanations of these subjects are essential.

The relationship between scientists, the scientific method, and science is thus: Scientists employing the scientific method can work within a particular discipline to help create and build a body of scientific knowledge to the point where its theories become principles and the discipline as a whole eventually becomes a science. The discipline remains a science through the continued building of scientific knowledge, which is regarded as a process rather than a result.

Scientific knowledge is any knowledge, enlightenment, or awareness that comes from examining events or problems through the lens of the scientific method. The accumulation of scientific knowledge in a particular subject or discipline leads to its development as a science. The classic definition of a science, as provided by Thornton (1997b, p. 12), is “an orderly body of knowledge with principles that are clearly enunciated,” as well as being reality oriented with conclusions susceptible to testing.

A strong caution is needed here. The use of statistics does not make something scientific. The use of a computer does not make something scientific. The use of chemicals does not make something scientific. The use of technology does not make something scientific. Wearing a lab coat does not make one’s conclusions scientific. Science is found in the interpretations, or inferences, made by the scientific examiner. The question is this: Was the scientific method used to synthesize the knowledge at hand, and has that

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1 Portions of this section have been adapted from Chisum and Turvey (2006).
knowledge been applied correctly to render subsequent interpretations, with the necessary humility! If forensic examiners are not scientific in their methods of examination, then it does not matter how many books, research studies, or agreeable colleagues they are able to cite in defense of their positions.

The **scientific method** is a way to investigate how or why something works, or how something happened, through the development of hypotheses and subsequent attempts at falsification through testing and other accepted means. It is a structured process designed to build scientific knowledge by way of answering specific questions about observations through careful analysis and critical thinking. Observations are used to form testable hypotheses, and, with sufficient testing, hypotheses can become scientific theories. Eventually, over much time, with precise testing marked by a failure to falsify, scientific theories can become scientific principles. The scientific method is the particular approach to knowledge building and problem solving employed by scientists of every kind.

The first step in the scientific method is **observation**. An observation is made regarding some event, fact, or object. This observation then leads to a **specific question** regarding the event, fact, or object, such as where or when an object originated or how an object came to possess certain traits.

The second step in the scientific method is attempting to **answer** the question that has been asked by forming a **hypothesis**, or an educated estimate regarding the possible answer. Often, there is more than one possible answer, and a hypothesis for each one must be developed and investigated.

The third step in the scientific method is **experimentation**. Of all the steps in the scientific method, this is the one that separates scientific inquiry from others. Scientific analysts design experiments intended to disprove their hypotheses. Once again, scientific analysts design experiments intended to disprove their hypotheses, not to prove them. At least one major forensic science text that provides readers with chapters on crime reconstruction and criminal profiling has failed to emphasize this crucial aspect of the experimentation or “testing” phase in theory development. Rather, crime reconstruction and criminal profiling are incorrectly presented in an overly simplified fashion for use by investigators looking to prove their theories (Baker and Napier, 2003, p. 538; Miller, 2003, pp. 128–129). These works collectively leave the door open for confirmatory bias. Inferences regarding crime-related actions or events are not intended to verify, confirm, or prove investigative theories. Rather, they are meant to support or refute investigative theories. The words support and confirm are worlds apart. The former suggests assistance, and the latter suggests finality. This difference may sound semantic to some, but it is not.

If the **job** of the criminal profiler were merely to work toward confirming law enforcement theories, then there would be no point in performing an in-depth analysis of any offense or related behavior. Confirmation is easy to find if that is what one looks for—all one needs to do is ignore everything that works against a prevailing theory and embrace anything that even remotely supports it. But that is not what the scientific method is about. The **absolute cornerstone** of the scientific method is falsification.

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3 It is important to explain that scientists use the scientific method to build knowledge and solve problems: its use defines them. If one is doing something else, then one is not actually a scientist. Paivinen et al. (1997, p. 48) warn: "Not all knowledge asserted by people who are commonly thought of as scientists is the product of the scientific method."

4 The authors have found that this has often been the best way to proceed when working with others to solve a problem, make a decision, or interpret the known facts. It is essentially brainstorming: coming up with all kinds of ideas regardless of their merit, getting them all down for everyone to see, and then killing off the weak with logic and reason, one at a time, as a group. The strongest solutions and theories will necessarily withstand this process. As Lee et al. (1983, p. 2) explain: "Forensic scientists engaged in reconstruction of events follow the essential principles of the scientific method. . . . In attempting to reconstruct the events that took place at the crime scene, for example, the first step is careful observation and assembly of all the known facts. Different hypotheses can then be entertained to see how well one or another corresponds to all the facts. As additional facts are disclosed by further observation or by experimental testing, it may be possible to arrive at a theory of what took place."
Science as Falsification

These considerations led me in the winter of 1919–20 to conclusions which I may now reformulate as follows.

1. It is easy to obtain confirmations, or verifications, for nearly every theory—if we look for confirmations.
2. Confirmations should count only if they are the result of risky predictions; that is to say, if, unenlightened by the theory in question, we should have expected an event which was incompatible with the theory—an event which would have refuted the theory.
3. Every “good” scientific theory is a prohibition: It forbids certain things to happen. The more a theory forbids, the better it is.
4. A theory which is not refutable by any conceivable event is nonscientific. Irrefutability is not a virtue of a theory (as people often think) but a vice.
5. Every genuine test of a theory is an attempt to falsify it, or to refute it. Testability is falsifiability; but there are degrees of testability: Some theories are more testable, more exposed to refutation, than others; they take, as it were, greater risks.
6. Confirming evidence should not count except when it is the result of a genuine test of the theory; and this means that it can be presented as a serious but unsuccessful attempt to falsify the theory. (I now speak in such cases of “corroborating evidence.”)
7. Some genuinely testable theories, when found to be false, are still upheld by their admirers—for example by introducing ad hoc some auxiliary assumption, or by reinterpretting the theory ad hoc in such a way that it escapes refutation. Such a procedure is always possible, but it rescues the theory from refutation only at the price of destroying, or at least lowering, its scientific status. (I later described such a rescuing operation as a “conventionalist twist” or a “conventionalist stratagem.”)

One can sum up all this by saying that the criterion of the scientific status of a theory is its falsifiability, or refutability, or testability.

—Sir Karl R. Popper (1963, pp. 32–39)

If a hypothesis remains standing after a succession of tests or experiments fail to disprove it, then it may become a scientific theory, which may be stated or presented with a reasonable degree of scientific certainty.

Scientific theories that withstand the test of time and study eventually become scientific principles. Although there is no universal agreement as to whether and when a scientific theory crosses the line to become a scientific principle, it is accepted that a scientific theory, developed with the assistance of the scientific method, has a greater degree of reliability and acceptance than mere observation, intuition, or speculation. With regard to criminal profiling, this may be explained in terms of establishing what traits are evidenced by established crime-scene behavior or not, as opposed to predicting or confirming that traits may or may not exist based on research or subjective experience. To argue for the presence of certain profile characteristics, one must establish the presence or absence of certain and relevant behaviors—not simply guess them or assume them, and then arbitrarily apply research findings that may or may not apply within the context of a particular case.

The correct use of the scientific method is impossible, however, without critical thinking and the science of logic to accurately synthesize, interpret, and apply the results.

Critical Thinking

The problem is not teaching the inferrer to think: the problem is the examination of how inferences have been made by another and what value his inferences may have for our own conclusions.

—Dr. Hans Gross (1924, p. 16)
There are many definitions of the term *critical thinking*. Their unifying concept is that critical thinking involves indiscriminately questioning assumptions in any arguments encountered in any context. This means rigorously questioning the assumptions beneath the reasoning and opinions of others as well as our own. Paul and Scriven (2004) offer the following description:

> Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action.

Sadly, most of the students and many of the professionals encountered by the authors have no idea what critical thinking is, what it involves, or why it is necessary. In fact, it is likely that most students reading this text will have never formally encountered the concept of critical thinking.

This may have something to do with the death of Socratic teaching methods in many universities or an increase in the number of unqualified instructors teaching pedantically from a script rather than using knowledge they have earned or built themselves. No matter the subject or reason, students have been, and continue to be, conditioned not to question, not to think critically, and to accept information as fact by virtue of the alleged expertise of their instructors. This reality is a dangerous, ego-driven farce. As Popper (1960, pp. 70–71) cogently explains, “no man’s authority can establish truth by decree.” This explicitly provides that questioning assumptions is a basic tenet of any forensic discipline. The danger of not questioning becomes apparent as we continue through this text. That students have been conditioned away from the virtues of critical thinking in any university setting is also ironic—the greatest gift given to a student by a liberal arts education used to be strong reasoning and critical thinking skills. That was the theory, at any rate.

For our purposes, the tragedy is compounded further because good critical thinking skills are at the heart of what makes a competent criminal profiler. Therefore, before we continue with this chapter, or with the rest of this text for that matter, we need to give ourselves permission to think outside of the confines that our colleagues, friends, parents, instructors, and experiences have placed around our minds. We need to give ourselves permission to question any and all assumptions, premises, and arguments and demand corroboration, no matter what the source. We need to free ourselves from the old habits of simply listening, taking notes, and accepting, and get into the habit of asking those who would purport to know things—why?

A brief overview of critical thinking is necessary. As described in Paul and Scriven (2004),

**Critical thinking can be seen as having two components:**

1. a set of skills to process and generate information and beliefs; and
2. the habit, based on intellectual commitment, of using those skills to guide behavior.

It is thus to be contrasted with:

1. the mere acquisition and retention of information alone (because it involves a particular way in which information is sought and treated); and
2. the mere possession of a set of skills (because it involves the continual use of them); and
3. the mere use of those skills ("as an exercise") without acceptance of their results.

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3 Thornton (1997b, p. 20) provides a useful standard against which to measure the reasoning of others: “Forensic science cannot be viewed solely in terms of its products; it is also judged by the legitimacy of the processes by which evidence is examined and interpreted. Any opinion rendered by a forensic scientist in a written report or in court testimony must have a basis in fact and theory. Without such a basis, conclusions reached are bereft of validity and should be treated with derision.”
Critical thinking varies according to the motivation underlying it. When grounded in selfish motives, it is often manifested in the skillful manipulation of ideas in service to one’s own, or one’s group’s, vested interest. As such, it is typically intellectually flawed, however pragmatically successful it might be. When grounded in fair-mindedness and intellectual integrity, it is typically of a higher order intellectually, although subject to the charge of “idealism” by those habituated to its selfish use.

For the purposes of forensic examination (which, again, includes criminal profiling) the application of critical thinking to casework means a staunch refusal to accept any evidence or conclusions without sufficient proof. It involves the careful and deliberate determination of whether to accept, reject, or suspend judgment about any information or related findings. It means skeptical gathering of evidence, skeptical examinations, and the skeptical interpretation of results.

This includes the following tasks:

1. Evaluating the nature and quality of any information and its source
2. Recognizing bias in all of its forms, including all of the sources of bias
3. Separating facts from opinions
4. Distinguishing between primary sources of information (unaltered—direct from the source) and secondary sources of information (altered—interpreted or summarized through someone else)
5. Synthesizing information.

The problem with critical thinking is that in some circumstances it is easier, and even alluring, to accept what others have told us or shown us rather than to investigate matters for ourselves. There may even be harsh consequences for questioning information or findings when they come from those who perceive themselves as our betters (or our supervisors). Some people simply don’t like to have their “facts” questioned, and in such cases profilers may have a standing policy to avoid criticism. They don’t want to appear rude or upset their clients. In reality, failing to be critical at all levels of examination protects inadequate information and subsequent conclusions; it is the best way to guarantee unreliable results.6

Although this can be useful as a practical matter, making things easier and keeping everyone happy, it does not make inferences based on uncritically accepted information or conclusions more reliable. Forensic examiners are warned to embrace the limitations and accept the consequences of any information taken uncritically when conducting their analysis.7

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6 Consider the following sworn testimony of then FBI profiler Robert Hazelwood. It was made before the Senate Armed Services Committee in a response to a succession of questions and answers regarding investigative assumptions that were left unchecked in the FBI’s analysis of the death of Clayton Hartwig aboard the USS Iowa (USS Iowa, 1990, pp. 25–26). “Whenever we [the FBI’s profiling unit] are requested to do a case for an investigative agency, we make the assumption that we are dealing with professionals. They provide us with the materials for review, and that’s what we review.” This helpful assumption circumvents the entire concept of critical thinking and makes profiling conclusions far less informed and reliable. Additionally, it may serve the purpose of absolving blame should the profiler be found to be wrong. It wasn’t my fault because the information I had was bad.

7 One of the authors (Turvey) was asked to examine a series of sexual homicides as well as a single case of arson for the purpose of case linkage (see Chapter 14, “Case Linkage”). In the course of examination, it was learned that the initial determination of arson had been made using shoddy practices and with disregard for NFPA guidelines (discussed in Chapter 16, “Fire and Explosives: Behavioral Aspects”). Subsequently, the theory of arson was disconfirmed by a more informed independent fire investigator’s analysis. The author’s final report read: “Since the criminal behavior of arson may not be assumed, this case is necessarily eliminated from any linkage analysis prepared in a forensic context for comparison to other crimes.” It further explains why to do otherwise would be unethcal: “According the Ethical Guidelines of the Academy of Behavioral Profiling, Members must render opinions and conclusions strictly in accordance with the evidence in the case.” Available online at http://profiling.org/abp_conduct.html.”
The Science of Logic

In the broadest sense, logic can be defined as the process of argumentation, or, as Farber (1942, p. 41) describes it, “a unified discipline which investigates the structure and validity of ordered knowledge.” According to Bhattacharyya (1958, p. 326):

Logic is usually defined as the science of valid thought. But as thought may mean either the act of thinking or the object of thought, we get two definitions of logic: logic as the science (1) of the act of valid thinking, or (2) of the objects of valid thinking.

Burch (2003, p. 1) provides us with an applied definition and identifies the role that logic plays:

Logic is the organized body of knowledge, or science, that evaluates arguments. An argument is a group of statements, the purport of which is that some of them (the premises) should support, imply, provide evidence for, or make reasonable to believe another particular one of them (the conclusion).

All of these descriptions are useful, because it is the ultimate purpose of logic to analyze the methods by which valid judgments are obtained in any science or discourse. This is achieved by the formulation of general laws that dictate the validity of judgments (Farber, 1942). But more than providing a theoretical framework for structuring arguments, the basic principles of logic allow for a rigorous formulation and testing of any argument, such as the characteristics inferred in a criminal profile.

McInerney (2004) outlined the following basic principles of logic:

The principle of identity. A thing is what it is. Existing reality is not a homogeneous mass, but it is composed of a variety of individuals. In criminal profiling, this principle may be used to argue for individually profiling particular crimes—that is, treating each case as an individual event, rather than as an extension of “similar” crimes. 8

The principle of the excluded middle. Between being and nonbeing, there is no middle state. Perhaps the best way to view this in the context of criminal profiling is “either a crime (or an action) has occurred, or it has not.” The key to establishing the validity of this premise is in carrying out a detailed and complete crime reconstruction to establish exactly what has occurred and what has not. Only through a full and complete forensic evaluation can the true nature and quality of the thing be known and then gauged.

The principle of sufficient reason. There is sufficient reason for everything. This may also be called the principle of causality. This principle states that everything in the known universe has an explanation for its existence. Implied here is that nothing in the physical universe is self-explanatory or the cause of itself, and, perhaps most important, that all instances of a thing must have an explanation that is realistic within accepted bodies of knowledge. Farber (1942) suggests that knowledge in its primary sense means true knowledge, in that it conforms to established facts of reality. In short, any argument put forth must not be sensational or rely on phenomenological explanations for its cause or existence. With respect to criminal profiling, this bars the examiner from assuming facts for the purpose of analysis or from using Martians, UFOs, or Bigfoot to explain events. And it requires that criminal profilers carefully establish the behavior that they intend to profile.

Induction

As already explained, the construction of a criminal profile is about making inferences; it is about the construction of rational arguments. There are essentially two general categories of reasoning behind the criminal profiling process, as with most forms of logic and argumentation. One can be described

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8 That is, of course, unless the point of the exercise is to determine if a crime is part of a series or if a crime is proven to be part of a series.
as *inductive reasoning*, referring to a comparative, correlational, or statistical process, often reliant on subjective expertise that is most associated with the development of psychological syndromes. The other has been described by the author as *deductive reasoning* and refers to a forensic-evidence-based, process-oriented method of investigative reasoning about the behavior patterns of a particular offender. This was formally explored in the first edition of this text (Turvey, 1999) and was inspired in part by sex offender research models published in Knight and Prentky (1990, p. 26).

Thornton (1997b, p. 13) offers the clearest explanation of the relationship between inductive and deductive reasoning:

*Induction is a type of inference that proceeds from a set of specific observations to a generalization, called a premise. This premise is a working assumption, but it may not always be valid. A deduction, on the other hand, proceeds from a generalization to a specific case, and that is generally what happens in forensic practice. Providing that the premise is valid, the deduction will be valid. But knowing whether the premise is valid is the name of the game here; it is not difficult to be fooled into thinking that one’s premises are valid when they are not.*

Forensic scientists have, for the most part, treated induction and deduction rather casually. They have failed to recognize that induction, not deduction, is the counterpart of hypothesis testing and theory revision. They have tended to equate a hypothesis with a deduction, which it is not. As a consequence, too often a hypothesis is declared as a deductive conclusion, when in fact it is a statement awaiting verification through testing.

An inductive argument, then, is where the conclusion is made likely, a matter of some probability, by offering *supporting conclusions*. It is at best a prediction about what might be true. As Burch (2003, p. 7) explains,³

*There are several common types of inductive arguments, including predictions about the future, arguments from analogy, inductive generalizations, (many) arguments from authority, arguments based on signs, and causal inference.*

A good inductive argument provides strong support for the conclusion offered, but this still does not make the argument infallible. A criminal profile is a set of offender characteristics (conclusions) based on premises that should be articulated in the body of the profile itself. As already suggested, deductive reasoning involves conclusions that flow logically from the premises stated. It is such that if the premises are true, then the subsequent conclusion must also be true. Inductive reasoning involves broad generalizations or statistical reasoning, where it is possible for the premises to be true while the subsequent conclusion is false.

Inductive arguments lead to the development of hypotheses and come in a variety of forms (Lee et al., 1983, p. 2). Two types of inductive arguments, however, seem to be more prevalent in criminal profiles than others. The first is the inductive generalization, which argues from the specific to the general (many of those the author has encountered believe that this is the only defining characteristic of inductive reasoning, having gone as far as their dictionary to research the matter). In this instance, conclusions are formed about characteristics from observations of a single event or individual or a small number of events or individuals (Walton, 1989, p. 198). Then a hasty generalization is made suggesting that similar events or individuals encountered in the future will share these initially observed, or sampled, characteristics. In *The Logic of Scientific Discovery*, Karl Popper argues against the use of generalizations by noting (Popper, 2003, p. 4):

³ On the same page, Burch (2003) provides a stern warning to those looking to oversimplify this issue for lack of actually understanding the difference between induction and deduction. He states, “One should not use as a criterion for distinguishing deductive from inductive arguments the claim that deductive arguments go from general to particular, while inductive arguments go from particular to general.” The use of this single criterion, or a variant, indicates a simplistic and incomplete understanding of these subjects.
It is far from obvious from a logical point of view, that we are justified in inferring universal statements from singular ones, no matter how numerous; for any conclusion drawn in this way may always turn out to be false: no matter how many instances of white swans we may have observed, this does not justify the conclusion that all swans are white.

The second type of inductive argument common to criminal profiling is the statistical argument. The truthfulness of statistical arguments is a matter of probability, a matter of likelihood (Walton, 1989, p. 199). They may sound good, even convincing, and tend to play to our "common sense" stereotypes. This is one of the reasons they are so seductive. But they are inherently unreliable and problematic.

It is also important to keep in mind that an inductive argument can contain both inductive generalizations and statistical arguments; they are not mutually exclusive.

For clarity and accuracy, inductive arguments should contain the requisite qualifiers, such as normally, likely, often, many, rarely, most, some, probably, usually, always, never, and so on. The trouble is that many criminal profilers have stopped using such qualifiers in their reports because they know that inductive reasoning is far weaker and far less accurate than deductive reasoning. Other major reasons for the failure to qualify conclusions and premises alike include ego and ignorance; many profilers do not really wish to share the weakness of their arguments with end users, or they open themselves to the questions and criticisms that would follow. And, perhaps most dangerous of all, many more are ignorant of the difference.

One common example of inductive argumentation in criminal profiling may be found in the issue of inferring offender sex. Crime figures from the United States in 2002 (Federal Bureau of Investigation, 2002) suggest that 90% of people who committed murder in that year were male. Federal Bureau of Investigation (FBI) profilers (who currently refer to themselves as Criminal Investigative Analysts) use these and similar data to make inductive inferences in their profiles to this day. This language is taken directly from an FBI profile (a.k.a. criminal investigative analysis) written by SSA James McNamara (2000):

The behavior at this crime scene indicates that the offender is a more mature male. We would expect him to be in his late 20s or early 30s at least. It should be noted that we mean the offender’s emotional age, not necessarily his chronological age. Statistically speaking, absent any forensic or eyewitness evidence to the contrary, we believe the offender to be a white male. Most interpersonal violence is intra racial. No suspect should be eliminated based on age or race alone. The FBI’s Uniform Crime Report for 1998 (the most recent edition) indicates for white female victims of homicide, white males were the offenders in 86% of the cases.

The inductive qualifiers in this example include “statistically speaking,” “most,” and “86%.” Even though this specific statistic is relatively compelling, and many arguments are nowhere near this certain, it does not mean that every homicide committed in a given year will be committed by a male. Therefore, the final inductive argument above provides a degree of certainty largely dependent on a single variable plucked from the data out of context. The percentage will differ, for example, depending on the type of homicide, the weapon used, and a whole host of complicating variables. We also know without having to look at formal studies that women do in fact commit the crime of homicide. Inferring that most homicides are committed by a male, and therefore assuming and subsequently inferring that the offender in the present case must be male, is borderline unethical—without explicit qualification, it leaves a false impression in the mind of those reading the profile.

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10 Sex refers to the division of a species into male or female. Gender refers to sexual identity as it relates to society or culture. For example, someone who is born with male reproductive organs may choose later in life to transition outwardly toward female dress, habits, and expression. That person’s sex would remain male, although the person would be considered female with respect to gender. The authors have encountered much ignorance on this subject.
The lack of certainty the profiler has about his or her conclusions should be reflected in the end product by the language used to convey the characteristic. Unfortunately, this does not always happen, and occasionally a profiler may stray into offering uncertain characteristics as though they had been unequivocally established. This may be referred to as offering an inductive conclusion deductively or, depending on the structure and the formation of the argument, a false deduction.

As already suggested, inductive profiles may also involve arguments where the premises themselves have been assumed. That is to say, too many inductive profilers do not bother to check the validity of their premises or simply assume a premise for the sake of arguing a conclusion. This happens far more than most profilers care to admit, often because they do not possess the knowledge or ability to check the veracity of their premises. We revisit this theme more than once throughout this text.

Although this section may appear to advocate the abandonment of inductive methods or argumentation, the authors agree that induction has many appropriate uses when applied in the context of the scientific method. Most importantly, induction provides a useful starting point in generating theories that may later be subjected to testing before developing a deductive conclusion.

**Deduction**

Deductive reasoning, strictly speaking, involves arguments whereby, if the premises are true, then the conclusions must also be true. In a deductive argument, the conclusions flow directly from the premises given (Walton, 1989, p. 110). Or, as Lee et al. (1983, p. 2) describe it,

> In deductive logic, a conclusion follows inescapably from one or more of the premises. If the premises are true, then the conclusion drawn is valid.

Burch (2003, p. 6) reminds us:

> When the arguer claims that it is impossible for the conclusion to be false given that the premises are true, then the argument is best considered a deductive argument. When the arguer merely claims that it is best considered improbable that the conclusion be false given that the premises are true, then the argument is best considered an inductive argument.

A deductive argument is structured so that the conclusion is implicitly contained within the premise; unless the reasoning is invalid (as in a false deduction or a non sequitur), the conclusion follows as a matter of course. It is designed so that it takes us from truth to truth. That is, a deductive argument is valid if (Alexandra, Matthews, and Miller, 2002, p. 65)

- It is not logically possible for its conclusion to be false if its premises are true.
- Its conclusions must be true, if its premises are true.
- It would be contradictory to assert its premises yet deny its conclusions.

For these reasons, it is incumbent on the criminal profiler to establish the veracity and validity of every premise before attempting to draw conclusions from them. Inferences without this level of care are not deductive.

A criminal profile that results from a deductive argument is by no means static. Like any forensic report, its conclusions should be re-examined when new facts and information become available. However, a criminal profile that results from this process is by no means static and may be updated in light of new information. Further evidentiary considerations, such as new physical evidence, may be incorporated into the decision process to update the conclusion. Also, new advances in science and understanding may challenge long-held
assumptions and question the current hypothesis. This is not a problem with the process, because a deduction can only operate within the realm of established laws and principles. Farber (1942, p. 48) makes clear this tenet of argumentation:

Every “logical system” is governed by principles of structure and meaning. A system that claims to be a “logic,” i.e., which operates formally with one of the various definitions of implication, possibility, etc., is subject to the laws of construction of ordered thought, namely, to the fundamental principles of logic. This requirement imposed on all systems cannot amount to a law that there shall be law. The specific application is provided by the rules in each system.

When the laws or principles of a logical system, such as a crime scene, change because of new knowledge from further testing or observation, so too must the nature of the deductions made.11

**Fallacies of Logic**12

Perhaps the most revealing indicator of the absence of analytical logic and the scientific method in a criminal profile is the presence of logical fallacy. Logical fallacies are errors in reasoning that essentially deceive those whom they are intended to convince. This does not mean that the fallacious criminal profiler is being intentionally deceptive. What it does mean is that some criminal profilers lack the intellectual dexterity to know whether and when their reasoning is flawed. This is discussed further in the next section, Metacognition.

Forensic examiners of all disciplines would do well to learn more about fallacies in logic and reasoning in order to avoid them in their own work as well as identify them in the work of others. Common logical fallacies in criminal profiling and the forensic disciplines in general include, but are certainly not limited to, the following:

**Suppressed Evidence or Card Stacking**

This is a one-sided argument that presents only evidence favoring a particular conclusion and ignores or downplays the evidence against it. It may involve distortions, exaggerations, misstatements of facts, or outright lies. This is not an acceptable practice for any forensic practitioner.

**Example**

One of the authors (Turvey) was asked to examine two separate instances of sexual homicide for the purpose of case linkage in postconviction (Illinois v. Anthony Mertz, 2003). This included reviewing the trial testimony of the prosecution’s expert in criminal profiling, retired FBI profiler James Wright of Park Dietz and Associates. As described in the author’s report,

According to Mr. Wright’s own testimony regarding the homicides of Amy Warner (1999) and Shannon McNamara (2001) (pp. 1964–1965): “The—the scenes were—were different in a lot of respects but there were some similarities. Certainly one was the—the attack of the throat and also that the arms were extended over the head, which is also something that’s fairly consistent with what some of the witnesses have said about when they were attacked by Mr. Mertz, is that the arms were extended over the head and down. Those are the two biggest things, is the attack of the throat and the arms.” The many differences conceded are not discussed or explained in the testimony of Mr. Wright. …

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11 The explicit mechanics of deductive profiling are detailed in Chapter 5, “An Introduction to Behavioral Evidence Analysis.”

12 This section has been adapted from Chisum and Turvey (2006).
When comparing the behavioral evidence in these two cases, of greatest significance are the distinctive differences between them. This includes the following:

1. The lack of blood evidence elsewhere in her residence suggests that Amy Warner (AW) was attacked and died in the same location—in her living room on her couch.
2. According to crime scene investigator Richard Caudell, Shannon McNamara (SM) was apparently attacked as she slept. The evidence suggests that a struggle began in her bedroom and continued in the bathroom, where she was eventually overcome. Then, dead or dying, she was moved to the living room of her apartment where she was posed or “put on display.”
3. AW suffered a “massive incise wound” to her neck, SM suffered some lesser incise wounds to the neck, and manual strangulation, including a fractured hyoid bone.
4. SM had a washrag stuffed tightly into her mouth.
5. AW was discovered hanging headfirst off of the couch in her living room, her head resting on a pillow on the floor; SM was found lying on her back in her living room, on the floor, in a position to be discovered by the first person to open the front door.
6. AW was discovered wearing “a pink short sleeved blouse with no brassiere,” nude from the waist down; SM was nude, however her arms were above her head, with her shirt pulled over her head onto her arms.
7. AW was discovered with her face in full view; SM was discovered with her face covered by her arms and shirt, evidencing depersonalization (Burgess et al., 1992; p. 352).
8. SM suffered a “widely gaping” postmortem incised wound to the upper abdomen, exposing a portion of her bowel.
9. SM suffered an incise wound to her external genitalia.
10. SM suffered multiple stab and incise wounds to her buttocks and anus.
11. SM suffered three parallel incise wounds across her back.
12. SM suffered one incise wound along the length of her back.
13. The motive for AW’s murder is consistent with anger or retaliation, as evidenced by the brutality and overkill in her injuries, and the lack of other motivational evidence.
14. The motive for SM’s murder is consistent with sexual assault in combination with a desire to engage in eroticized post-mortem mutilation, as evidence by the extensive post-mortem mutilation to sexualized areas of the body, and the post-mortem display.

It should be mentioned that Wright testified that he was asked to render an opinion in court as to whether or not Mertz, the defendant, was responsible for both cases described here. This is most certainly a form of criminal profiling: naming the individual responsible renders not just some, but all, offender characteristics. Moreover, testifying whether a specific individual is responsible for a specific crime directly invades the province of the jury. It is one matter to compare offense behavior and connect scenes or offenses in a behavioral or even evidentiary sense. Wright’s testimony went beyond that; he named the person responsible. This is not only unethical expert conduct in many professional circles, it is usually inadmissible. Doing so while card stacking, or suppressing clear evidence unfavorable to the preferred position of one’s client, removes logic and reason from the effort.

**Appeal to Authority**

Appeal to authority occurs when someone offers a conclusion based on the stated authority or expertise of themselves or others. Such reasoning can be fallacious when the authority lacks the expertise suggested; when the authority is an expert in one subject, but not the subject at hand; when the subject is contentious and involves multiple interpretations, with good arguments on both sides; when the authority is biased; when the area of expertise is fabricated; when the authority is unidentified; and when the authority is offered as evidence in place of defensible scientific fact.
Example

When FBI agents write criminal profile reports (a.k.a. criminal investigative analysis reports), it is not uncommon for them to offer collective opinions on behalf of the FBI’s entire National Center for the Analysis of Violent Crime (NCAVC) or Behavioral Analysis Unit (BAU), as though every member has reviewed all of the evidence in the case and has independently concurred. Opinions tend to be expressed in this fashion when the individual profiler lacks sufficient education, training, or experience on a particular issue—or in profiling in general. A recent case report from a BAU profiler reads in the first paragraph, “It is the collective opinion of the BAU.” Other reports read, “we believe” or “we feel” or “we conclude”—to summon support for opinions by virtue of a collective agency authority that can never truly be measured, tested, or cross-examined.

It is common for forensic experts of all kinds to offer their years of experience as evidence of reliability and accuracy. However, experience, reliability, and accuracy are not necessarily related. Though skill and ability are potential benefits of age and experience, it does not follow that those with experience will necessarily gain skill or ability, let alone be reliable and accurate in their examinations. As Thornton (1997b, p. 17) explains, summoning experience instead of logic and reasoning to support a conclusion is an admission to lacking both:

Experience is neither a liability nor an enemy of the truth; it is a valuable commodity, but it should not be used as a mask to deflect legitimate scientific scrutiny, the sort of scrutiny that customarily is leveled at scientific evidence of all sorts. To do so is professionally bankrupt and devoid of scientific legitimacy, and courts would do well to disallow testimony of this sort. Experience ought to be used to enable the expert to remember the when and the how, why, who, and what. Experience should not make the expert less responsible, but rather more responsible for justifying an opinion with defensible scientific facts.

In other words, the more experience of quality and substance one has, the less one will need to tell people about it in order to gain their trust and confidence—the quality of one’s experience is demonstrated through the inherent quality of one’s methods and results.

Furthermore, experience in finding, collecting, or packaging evidence (a.k.a. crime scene processing or crime scene investigation) is not related to experience interpreting the meaning of evidence in its context (e.g., crime reconstruction and criminal profiling). This would be an appeal to false authority. As O’Hara (1970, p. 667) explains, the role of crime scene investigator and the role of evidence interpretation should not intersect:

It is not to be expected that the investigator also play the role of the laboratory expert in relation to the physical evidence found at the scene of the crime, ... It suffices that the investigator investigate; it is supererogatory that he should perform refined scientific examinations. Any serious effort to accomplish such a conversion would militate against the investigator’s efficiency.

...In general the investigator should know the methods of discovering, “field-testing,” preserving, collecting, and transporting evidence. Questions of analysis and comparison should be referred to the laboratory expert.

Appeal to Tradition

The appeal to tradition reasons that a conclusion is correct simply because it is older, traditional, or “has always been so.” It supports a conclusion by appealing to long-standing, institutional, or cultural opinions, as if the past itself were a form of authority. This argument may be stated in a way that suggests the tradition of using a method is equivalent to establishing the reliability and validity of a method. In other words: If it didn’t work, nobody would use it. This is far from true.
Example

In *Tennessee v. William R. Stevens* (McCrary, 2001), when queried as to the reliability of “crime-scene analysis” and “motivational analysis,” retired FBI profiling expert Gregg O. McCrary stated, “[T]he proof ... [that] there is validation and reliability in the process is that it’s being accepted. Uh—it’s being used and the demand is just outstripping our resources to provide it.” Furthermore, “[H]e explained that this type of analysis is ‘not a hard science where you can do controlled experiments and come up with ratios in all this,’ but the increased demand for such services exemplifies its effectiveness.”

This line of reasoning is a direct appeal to both the past tradition of, and current demand for, FBI profiler assistance as evidence of its efficacy. The trial court recognized this fallacy and concluded that the expert’s testimony regarding the motivation of the suspect did not comply with Tennessee Rule of Evidence 702 “in terms of substantially assisting the trier of fact because there is no trustworthiness or reliability.” In the end, the trial court opined, “Although this type of sophisticated speculation is undoubtedly very helpful to criminal investigators, it is not sufficiently reliable to provide the basis for an expert opinion in a criminal trial.” The Tennessee appellate court affirmed the trial court’s decision by noting, “the Court is not convinced that this type of analysis has been subjected to adequate objective testing, or that it is based upon longstanding, reliable, scientific principles.” Consequently, a tradition of use and a high demand for services do not equal reliability or accuracy.

**Argumentum ad Hominem, or “Argument to the Man”**

Ad hominem argument attacks an opponent’s character rather than an opponent’s reasoning. Because of its effectiveness, it is perhaps the most common logical fallacy. It is important to note that, even if they are true, arguments against character are not always relevant to the presentation of scientific conclusions, logic, and reasoning.

Example

In *United States v. O. C. Smith* (McCrary, 2005), retired FBI profiler Gregg O. McCrary provided a criminal investigative analysis (CIA) to the prosecution regarding the alleged abduction and assault of O. C. Smith that ended in a bomb’s being strapped to his chest and his being suspended from a fence. McCrary’s report details the accounts of a number of people known to O. C. Smith, including their beliefs that Smith’s claims were false. For example, McCrary cites Dr. Steven Symes, a colleague of Smith, and notes, “Dr. Symes believes that the June 2002 attack on Dr. Smith is just too unusual, too detailed and too complicated and far fetched for him to believe” (p. 28). Further, McCrary cites Richard Walter, a prison therapist, who has known Smith for a period of years. Walter did not believe that the attack on Smith was real because the defendant is physically fit, machismo, rough and ready, smart and doesn’t like to be touched. He advised that Dr. Smith likes to pretend he is on covert operations and Walter doesn’t believe Dr. Smith would allow someone to tie him up easily with wire and a bomb. ... Mr. Walter believes that the June 2002 incident was dramatic, could be considered “overkill” and involved too much planning to be legitimate. Mr. Walters believes that Dr. Smith manufactured the incident for theater.

A good deal of Mr. McCrary’s report could be distilled to ad hominem commentary about O. C. Smith’s character rather than substantive forensic analysis of the crime or related behavior. That is to say, large sections of the report read like “Person X does not like O. C. Smith and believes his report is false, therefore his
report is likely to be false.” It is illogical to suggest that, because someone has qualities that others may or may not like, the person must also lack credibility.\textsuperscript{13}

**Emotional Appeal**

Emotional appeal attempts to gain favor based on arousing emotions or sympathy to subvert rational thought.

**Example**

In 2001, one of the authors (Turvey) was retained as an expert in a civil action involving accusations of rape against a supervisor made by multiple subordinates. Opposing counsel had hired retired FBI profiler Greg M. Cooper to examine the complainant’s statements. Cooper prepared what he referred to as a “behavioral investigative analysis” report, which was premised, inappropriately, on the assumption that the rapes did in fact occur. The report concludes that the victims shared similar characteristics and heightened risk, and that the offender groomed them in a similar fashion while committing the crimes in a similar manner.

However, the report itself was not written as an objective forensic document. It was written almost like an excerpt from a true-crime novel, using sensational and emotional language (such as “conviction,” “cloak of deception,” and “menacing sexual predator”) and using inappropriately rendered analogies (such as “for the kill,” “the hunt,” and “wolf in sheep’s clothing”) to subtly play to the emotions of the reader, as opposed to maintaining an objective forensic stance. At times the report lapsed into what can be described as a stream of consciousness, with specific ruminations about the beliefs and fantasies of the offender. One such passage reads as though the author is purporting to channel the offender’s post-offense mental state (Cooper, 2001, p. 4): “Having conquered his prey and satiated his fantasies, the ‘charm’ recedes.” While this style of writing may be acceptable in a true-crime novel, or in a memoir, it has no place in an objective forensic report.

**Post Hoc, Ergo Propter Hoc, or “After This, Therefore Because of This”**

This fallacy occurs when one jumps to a conclusion about causation based on a correlation between two events, or types of events, that occur simultaneously.

**Example**

One of the authors (Turvey) examined a case involving the murder of a factory worker (Figure 2.1). The evidence demonstrated that, as he lay sleeping, the victim was stabbed twice in the heart through the chest, in the same wound path. The bloody steak knife used to kill him had been taken from a knife block in his kitchen and was found by investigators on the floor next to his bed. Subsequently, the bed was either set on fire or caught fire accidentally from cigarettes burning at the scene. It was not possible to determine which with the available evidence. The arson investigator reasoned, without direct facts or evidence of arson, that evidence of homicide was proof enough that the fire must have been set to conceal it. The author wrote in his report, “The opinions expressed in the arson investigator’s report seem to assume that arson must have

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\textsuperscript{13} If someone possesses the specific characteristic of dishonesty, then certainly this must be taken into account when considering the truth of his or her statements. However, not liking someone, thinking that he or she dresses funny or looks strange, or similar irrelevant personal attacks do not have a logical bearing on the individual’s truthfulness.
occurred because there was a homicide, and work backwards from that assumption without interest in proving it to any reliable degree. This is a basic fallacy of logic that incorrectly presumes ‘with this, therefore because of this’.

**Hasty Generalizations**

Hasty generalization occurs when one forms a conclusion based on woefully incomplete information or by examining only a few specific cases that are not representative of all possible cases.

**Sweeping Generalization**

Sweeping generalization occurs when one forms a conclusion by examining what occurs in many cases and assumes that it must or will be so in a particular case. This is the opposite of a hasty generalization.

**Example**

In *California v. Jennifer and Matt Fletcher* (2004), the prosecution asked FBI profiler SSA Mark Safarik to perform an analysis of a crime scene involving the police officer Joel Shanbrom, who was shot to death in his home (Figure 2.2). In that case, Shanbrom’s wife, Jennifer, told police that intruders entered their home while she was bathing their child. She stated that she heard them shoot her husband while she hid with their son. SSA Safarik determined that the scene was actually a domestic homicide that had been staged to appear like a burglary gone wrong. SSA SAFARIK’S CRIMINAL INVESTIGATIVE ANALYSIS, DATED JUNE 17, 2002, PROVIDES THE FOLLOWING LINES REASONING TO SUPPORT THIS FINDING, AMONG OTHERS (SAFARIK, 2002):

**FIGURE 2.1**

A 47-year-old male homicide victim who was stabbed to death while sleeping in his home. After working their way through the house, firefighters encountered his corpse, which was face down on his bed. He was removed from the bed to this position.

**FIGURE 2.2**

Joel Shanbrom, 32, was a five-year veteran police officer for the Los Angeles Unified School district. He patrolled schools in Verdugo Hills. His wife of seven years, Jennifer, worked at a dental office. Both were moonlighting, selling life insurance for Primerica, partnered with Matt Fletcher. On March 18, 1998, Joel Shanbrom was shot and killed in his home by a .410 shotgun, with three shots using mixed loads (birdshot and a slug). Jennifer told police that armed men entered their home and killed her husband while she and their son, Jacob, 3, hid in a concealed upstairs bathroom. A few years later, Jennifer Shanbrom married Matt Fletcher. Police saw this as evidence of an affair and arrested them both four years after Joel’s murder. FBI profiler Mark Safarik testified that the scene was staged and that Jennifer’s story did not add up. With no physical evidence whatsoever linking either to the crime, both were convicted based on this testimony.
- “Burglaries generally occur in unoccupied dwellings.” (p. 11)
- “Experientially, if the offender was a stranger and had departed the residence from this door [the sliding glass door in the family room], he would not [have] bothered closing the door behind him.” (p. 19)

These are sweeping and hasty generalizations, respectively. It is true that burglars enter both occupied and unoccupied dwellings with the intent to steal property—not just unoccupied dwellings. However, what is generally true based on SSA Safarik’s understanding of the statistics is of no concern regarding the analysis of a particular case. Just because something is common in his experience does not prove that it actually occurred. Arguing in this fashion is a sweeping generalization. His argument is an inductive theory awaiting verification through forensic analysis and testing—not a deductive conclusion. It may also be true that SSA Safarik’s experience has been that strangers do not close the door behind them when leaving the scene of a crime, but there is no way to verify it in this case. However, there are also no published studies of this issue, and his experience with residential burglary is unquantified, leaving us to understand that it is characterized by the four years he spent as police investigator in a small police department in Northern California. Arguing from such a narrow experience base, and without the support of the published literature, is a form of hasty generalization. Either way, again, his statement is an inductive theory awaiting verification through forensic analysis and testing—not a deductive conclusion.

**False Precision**

False precision occurs when an argument treats information as being more precise than it really is. It is characterized by conclusions that are based on imprecise information that must be taken as precise in order to adequately support the conclusion.

**Example**

Robert Lee Yates, Jr., was a serial murderer who picked up women in the area of Spokane, Washington—many while they were working as prostitutes to pay for their drug addictions (Figure 2.3). Some he frequented regularly and was quite friendly with, giving them rides, advice, and gifts. Others he shot in the head, and then he dumped their bodies in remote outdoor locations. (Except for Melody Murfin, whom he buried beside his house under concrete.)

In *Washington v. Robert Yates* (2003), the Tacoma Police Department contacted profiler Robert D. Keppel, Ph.D., and his longtime friend at the Pierce County district attorney’s office, assistant prosecutor Barbara
Corey-Boulet.\textsuperscript{14} The police wanted Keppel to review 12 homicide cases to determine whether there was a behavioral linkage. Keppel provided his clients with a “modus operandi and signature analysis” report dated March 26, 2002 (Keppel, 2002). That report offers the opinion that the cases are linked in the context of behavioral evidence and in light of the rarity of some of the offense behavior as determined by the computerized Homicide Investigation and Tracking System (HITS) database in Washington State. At the time, Keppel performed a key word search of the 1,541 cases in the database involving women killed between 1981 and 2002.

According to Keppel and Weis (1993, p. 1),

HITS is a computerized murder and sexual assault investigation program that collects and analyzes information pertaining to specific serious criminal offenses. The system relies on law enforcement agencies in Washington State to voluntarily submit information to HITS investigators.

One of the authors (Turvey) was retained as an expert in criminal profiling and linkage analysis to examine the Yates case, including the results of Keppel’s modus operandi and signature analysis report. After requesting and examining a great deal of discovery material related to the HITS program, the author learned that most agencies in Washington State do not actually submit their cases to HITS—which is why the database has so few cases in it. The HITS budget includes subscriptions to major newspapers around Washington State, and HITS analysts cull these publications for cases, which are subsequently entered into HITS in order to fill the database. These and other concerns were expressed in the authors’ report, which reads in part (Turvey, 2002):

6. \textbf{Unreliable HITS Data}

The data in the HITS case database is unreliable (and subsequent conclusions drawn from the data are equally unreliable) for the following reasons:

A. HITS data uncritically relies on information and opinions provided by the requesting agency as reliable (according to the Memo from John Turner, Chief Criminal Investigator of HITS to Mary Kay High dated April 30th, 2002, p. 2, Q11);

B. Many of the HITS form fields involve providing crime reconstruction opinions that may be beyond the ken of a given criminal investigator.

C. Many of the HITS form fields involve subjectively derived profiling-oriented, legal, and psychiatric opinions rather than objective facts (motive, psychopathy, victim risk, face covering, symbolic artifacts, offender anger, offender lifestyle). It should also be noted that the HITS Coding manual uses the term “Crazy People” to define the mental/insane category and inaccurately defines psychopathic as someone that commits psychopathic offenses;

D. The HITS database is apparently populated by case information at various levels of verification and reliability;

E. The HITS database is populated by an unknown number of unverified cases drawn from media/newspaper accounts (according to HITS SOP, Newspaper Descriptions dated 9/5/96 as well as the Memo from John Turner, Chief Criminal Investigator of HITS to Mary Kay High dated April 30th, 2002, p. 2, Q6);

\textsuperscript{14} The unfortunate case of assistant prosecutor Barbara Corey-Boulet is discussed in Chapter 12, “Victimology.”
7. Unknown Case Linkage Error Rate

The case linkage error rate for HITS or those using HITS results is unknown.

A. According to job description information provided in relation to HITS, Tamara Matheny (a HITS Crime Analyst) maintains a monthly log of all positive investigative analysis. I have not seen this log in the discovery material provided.

B. According to the Memo from John Turner, Chief Criminal Investigator of HITS, to Mary Kay High dated April 30th, 2002 (p. 3, Q17), asking for a showing of the error rate of HITS is too vague. This answer seems evasive. It is apparently not known how often probabilistic HITS linkages are right and how often they are wrong.

Without this information, the reliability of HITS query results must remain in question.

8. False Negatives

The false negative case linkage rate for the HITS database is unknown. That is to say, it is not known how often HITS results, or the interpretation of HITS results, have unlinked a known offender and their known offense. This is stated in the Memo from John Turner, Chief Criminal Investigator of HITS, to Mary Kay High dated April 30th, 2002 (p. 3, Q19). Without this information, the reliability of HITS query results must remain question.

9. False Positives

The false positive case linkage rate for the HITS database is unknown. That is to say, it is not known how often HITS results, or the interpretation of HITS results, have linked a known offender and an offense known to have been committed by another offender. This is stated in the Memo from John Turner, Chief Criminal Investigator of HITS, to Mary Kay High dated April 30th, 2002 (p. 3, Q20). Without this information, the reliability of HITS query results must remain question.

Subsequent to the filing of this report, the court agreed with the author that the HITS database is too unreliable for forensic conclusions, and it barred Keppel’s testimony and the related findings.

It bears mentioning that presenting precise statistics or numbers in support of an argument gives the appearance of scientific accuracy when it may not actually be the case. Many find math and statistics overly impressive and become intimidated by those who wield numbers, charts, and graphs with ease. This is especially true with DNA evidence, whose astronomical statistical probabilities are often presented by those without any background in statistics and without a full understanding of the databases that such probabilities are being derived from.

In light of varying DNA databases and subsequent impressive statistics being read in court to bedazzled jurors, and the outright fabrication of statistics related to hair comparisons, the caution offered in Kirk and Kingston (1964, p. 434) is more appropriate now than ever: “Without a firm grasp of the principles involved, the unwary witness can be led into making statements that he cannot properly uphold, especially in the matter of claiming inordinately high probability figures.” A more specific criticism of forensic practices was provided in Moenssens (1993):

Experts use statistics compiled by other experts without any appreciation of whether the database upon which the statistics were formulated fits their own local experience, or how the statistics were compiled. Sometimes these experts, trained in one forensic discipline, have little or no knowledge of the study of probabilities, and never even had a college-level course in statistics.
Those using statistics to support their findings have a responsibility to find out where the statistics come from, how they were derived, and what they mean to the case at hand. This must happen before the user forms conclusions and certainly before he or she testifies in court. The user also has a responsibility to refrain from presenting statistics without understanding or explaining their limitations.

**METACOGNITION**

Ignorance more frequently begets confidence than does knowledge. —Charles Darwin (1871, p. 3)

As is discussed throughout this text, the field of criminal profiling is replete with examples of incompetent assessment and illogical inference. Examples include instances where the conclusion drawn about the offender doesn’t match the available evidence, where that same evidence is misinterpreted by the profiler, or where profilers have gone beyond their knowledge and skills to provide an inference outside their area of expertise. Some instances are obvious and may be even be characterized as deliberate attempts to misinform or mislead. Others may be the result of bias: A law enforcement profiler may subconsciously tailor an assessment so that its features match a suspect already in custody.

However, *not all falsehood and incompetence is deliberate or subconsciously influenced*. Many practitioners in the forensic community use inappropriate methods and weak or flawed logic simply because they do *not know any better*. At the most basic level, these profilers are not aware that what they are doing is inept because they lack the cognitive ability to recognize competency and incompetency alike. This relates to an area of cognitive psychology known as metacognition.

Metacognition (a.k.a. metamemory, metacomprehension, and self-monitoring) refers to “the ability to know how well one is performing, when one is likely to be accurate in judgment, and when one is likely to be in error” (Kruger and Dunning, 1999, p. 1121). At a fundamental level, metacognition can be conceived of as thinking about thinking. For metacognitive ability to engage, there must first be a level of self-awareness. This entails explicit knowledge that one exists separately from other people and full recognition of one’s capabilities, strengths, weaknesses, likes, and dislikes. Then practitioners must possess the requisite knowledge relating to their particular field in order to perform competently; they must know the basic principles and practice standards that they should employ and be able to explain why. Finally, they must have the cognitive capacity to stop or pause during the performance of a task or examination, reflect on their work and results, apply critical thinking skills, and critique their own performance to that point.

It has been demonstrated that, with respect to the nature of expertise, novice practitioners tend to possess poorer metacognitive skills than do expert practitioners, for lack of experience confronting their own errors or with problem solving particular to the geography of their domain. Moreover, Kruger and Dunning (1999, p. 1122) suggest that, based on these findings, “unaccomplished individuals do not possess the degree of metacognitive skills necessary for accurate self-assessment that their more accomplished counterparts possess.” As Kruger and Dunning (1999, p. 1121) explain,

> [W]hen people are incompetent in the strategies they adopt to achieve success and satisfaction, they suffer a dual burden: Not only do they reach erroneous conclusions and make unfortunate choices, but their incompetence robs them of the ability to realize it. Instead . . . they are left with the mistaken impression that they are doing just fine.
As discussed in the Preface, we refer to this particular phenomenon as metacognitive dissonance—believing oneself capable of recognizing one’s own errors in thinking, reasoning, and learning, despite either a lack of evidence or overwhelming evidence to the contrary. General examples include believing oneself to be knowledgeable despite a demonstrable lack of knowledge; believing oneself to be incapable of error despite the human condition; believing oneself to be logical in one’s reasoning despite regular entrapment by logical fallacies; and believing oneself to be completely objective despite the persistence of observer effects. Miller (1993, p. 4) explains: “It is one of the essential features of such incompetence that the person so afflicted is incapable of knowing that he is incompetent. To have such knowledge would already be to remedy a good portion of the offense.”

It is a chief purpose of this text to arm criminal profilers with the knowledge that they need to rid themselves of any burdens they suffer related to metacognitive dissonance. Awareness of the problem is a threshold step. The next steps involve taking to heart the tools and cautions that have been and will be further described in application. This includes the full embrace of all that critical thinking, the scientific method, and the science of logic have to offer. It is our hope that in the process, readers learn to recognize and call out the non sequiturs in their own work, as well as that of others. This can and will make the criminal profiling community more competent as a whole and more deserving of the trust that it is regularly afforded.

**SUMMARY**

Criminal profilers need to understand how valid inferences are made. This requires the use of the scientific method, an applied understanding of the science of logic, and knowing how to know when you are wrong. It also requires some understanding of bias.

The forensic community’s affiliation with both law enforcement and the prosecution has fashioned an atmosphere in which an unsettling number of forensic professionals have all but abandoned objectivity and have become completely partial to the prosecution’s objectives, goals, and philosophies.

The scientific observer is also inherently imperfect. This stems from the fact that subtle forms of bias, whether conscious or unconscious, can easily contaminate their seemingly objective undertakings. Observer effects are present when the results of a forensic examination are distorted by the context and mental state of the forensic examiner, to include the examiner’s subconscious expectations and desires. A strict adherence to, and a full embrace of, the scientific method is the first in a series of steps that can blunt the effects of even the most pervasive forms of bias.

**Questions**

1. Explain the difference between an *inference* and a *speculation*.
2. Metacognition is the ability to know oneself when one is ________________.
3. ________________is the cornerstone of the scientific method.
4. True or False: The goal of the scientific method, in application, is to prove the validity of a hypothesis or theory.
5. If an examiner’s methods or results are influenced by the real or perceived expectations of his or her employer, this would be an example of ________________.
6. When examiners question the reliability of information or inferences they are expected to rely on in their findings, this is an example of ________________.
REFERENCES


Cooper, G., 2001. Behavioral Investigative Analysis Report, undated, Borthick v. Benjamin et al. received August 10; on file with the authors.


