Bounded Rationality and Criminal Investigations: Has Tunnel Vision Been Wrongfully Convicted?

Brent Snook and Richard M. Cullen

"Cognition is the art of focusing on the relevant and deliberately ignoring the rest."

Gerd Gigerenzer and Peter Todd

A substantial portion of judgment and decision making research has led to the conclusion that using *heuristics* – simple mental strategies that people use to deal with our uncertain world – results in erroneous decisions. The message that "heuristics are bad" primarily stems from a wealth of research showing that human decision-making deviates from idealistic, statistics-based decision-making processes that strive for optimality (Kahneman, Slovic, & Tversky, 1982; Nisbett & Ross, 1980). In particular, it has been noted that heuristics ignore apparently relevant information, whereas the idealistic models are thought to examine everything. The negative view of heuristics has spread to many domains (see Gilovich, Griffin, & Kahneman, 2002, for some examples), including criminal investigations where the use of heuristics by police officers is thought to produce reasoning errors that contribute to criminal investigative failures (e.g., Findley & Scott, 2006). One heuristic-like process that is cited frequently as an explanation for criminal investigative failures is "tunnel vision." If investigating officers, for example, stop searching for additional suspects after locating a viable suspect, they may be accused of using tunnel vision. Despite a complete absence of empirical research on tunnel vision in criminal investigations, there have been calls to eradicate this mental "virus" (e.g., Cory, 2001; Findley & Scott, 2006). Specifically, it has been recommended that police officers should avoid using

tunnel vision by employing more deliberate and careful decision-making strategies. While this solution is intuitively appealing, its feasibility is questionable given: (1) the constrained context of criminal investigative decision making; and (2) the processing limitations of the human mind.

In this chapter, we outline a psychological framework called *bounded rationality* and illustrate how it applies to investigative decision making. Applying the bounded rationality perspective involves taking an ecological view of cognition by outlining the actual context where police officers work and determining whether the heuristics that officers use are efficient and effective decision-making strategies within that context. In taking an ecological view, we hope to gain some insight about when and why heuristics are likely to succeed and fail in the criminal investigative environment. We use tunnel vision as a primary example of how heuristics in policing have been vilified (see Lerner, 2005, for a more detailed discussion of how police heuristic-led judgments, are criticized in the criminal justice system). Tunnel vision appears to consist of a set of heuristics, which are arguably adaptive mechanisms that have evolved in the mind to allow people to make smart decisions. As with all judgments and decisions, decisions made at various points in the investigative process are constrained by time, knowledge, and mental capacity. We believe that it is unrealistic to expect police officers to investigate *all* possible suspects, collect evidence on *all* of those suspects, explore *all* possible avenues concerning the circumstances surrounding a crime, search for disconfirming and confirming evidence of guilt for every suspect, and integrate all of this information to make an "optimal" decision.

Has Tunnel Vision been Wrongfully Convicted as a Flawed Mental Tool?

Cases of wrongful conviction are being uncovered at an increasing rate and have rightfully received much public scrutiny (Huff, 2004; Huff, Rattner, & Sagarin, 1986; Rosen, 1992; Scullion, 2004). Such cases have devastating effects on wrongfully convicted individuals (see Campbell & Denov, 2004; Grounds, 2004) and allow guilty offenders to go free, thereby bringing disrepute and public mistrust to the administration of justice. In recognition of the need to prevent wrongful convictions, the Canadian Federal-Provincial-Territorial Heads of Prosecutions Committee (hereafter referred to as the FPT Committee) set up a Working Group on the Prevention of Miscarriages of Justice in 2002 to identify the factors that contribute to these justice system errors. The mandate of the FPT Committee was to, amongst other goals, ascertain why wrongful convictions were occurring, how criminal investigations were failing, how police resources could be used more efficiently, and how to facilitate the timely resolution of cases. The FPT Committee concluded that criminal investigative failures were sometimes a function of unethical conduct by investigators who assigned blame to the wrong individuals. In addition, the FPT Committee concluded that investigators sometimes failed to use best practices (e.g., having knowledge about recent research on eyewitness identification and testimony, line-up methods, interviewing and interrogation strategies, jail-house informants, and DNA technology), and that investigators suffered from tunnel vision. According to the varied definitions that have been offered, tunnel vision in the criminal investigative context involves: (1) identifying a primary suspect; (2) searching for information about that suspect; and (3) ignoring information that might disconfirm that the primary suspect is the culprit, including information about other plausible suspects.

The FPT Committee provided a series of policy recommendations aimed to eliminate, or at least reduce, future miscarriages of justice. They recommended that police agencies should

implement training, screening, and disciplinary policies to deal with unethical conduct; police officers should be educated on best practices; and that police officers should avoid tunnel vision. Although we wholeheartedly agree with the first two recommendations, we take issue here with the last one.

Those who argue that tunnel vision is a cause of wrongful convictions seem to believe that bad outcomes (the conviction of an innocent suspect) only result from either bad decision-making processes or bad investigators. But good processes and good investigators can also be associated with bad outcomes. Heuristics are normally effective and efficient strategies for handling complex information and drawing conclusions from that information, but in some instances can lead to error. The heuristics that make up tunnel vision are no exception. For example, even the most decorated police officer can be led astray by "misleading information" such as a fabricated eyewitness account (although this would not be known to that officer until after the fact). And whereas bad (e.g., malicious, indifferent, or "nobly corrupt") investigators may indeed be the cause of some investigations going awry, tunnel vision is an altogether different process.

The recommendation to "avoid," "correct," or "prevent" tunnel vision is therefore premature. Not enough is known about tunnel vision to make such recommendations. More specifically, such a recommendation is as likely to be ineffective as it is to be effective because: (1) tunnel vision is an ambiguous concept; (2) there has been no systematic study of the proportion of successful cases where police officers used tunnel vision; and (3) there has been no proper evaluation of the contribution of tunnel vision to wrongful convictions. Given that current complaints about tunnel vision are based on retrospective analysis of investigative fiascos (Findley & Scott, 2006) and the lack of controlled experimental research on the topic, it is not

surprising that there is no compelling empirical evidence to support the message that tunnel vision is a bad decision-making strategy. Indeed, the recommendations to correct tunnel vision appear to be based on nothing but "bad common-sense reasoning" (see Gendreau, Goggin, Cullen, & Paparozzi, 2002, for how bad common sense based policy recommendations, as opposed to those based on empirical evidence, can lead to the implementation of ineffective policies).

The idea that police officers should be wary of tunnel vision mirrors an ongoing debate in psychology about human rationality. Policy-makers and researchers who have prematurely focused upon tunnel vision as a flawed mental strategy might be able to increase the likelihood of reducing the occurrence of investigative failures by considering the issues that are at the heart of this debate, particularly the arguments that have been put forth since bounded rationality theory originated in the 1950s. Consequently, the primary goal of this chapter is to expose readers to the relatively recent developments in the wider rationality debate and illustrate how this debate is applicable to the understanding of heuristic-led judgments in criminal investigations.

We begin with an overview of the rationality debate. Put simply, researchers on one side focus disproportionately on the instances where heuristics produce errors. These researchers argue that using heuristics is irrational because heuristics are suboptimal to complex decision-making models that supposedly define the best possible way to make decisions. The other side argues that heuristics lead to good decisions. According to this second view, tunnel vision might be helpful to police officers on a psychological level, for example, by allowing them to focus their thoughts in a complex investigative environment. We then describe the criminal investigative environment and argue that it is unrealistic to expect officers to use what are

commonly referred to as fully rational decision-making models. This will be followed by an attempt to operationalize tunnel vision using existing heuristics that have been outlined and tested in the psychological literature.

The Rationality Debate in Psychology

The rationality debate is primarily about whether people make good decisions. Arguably, the most contentious issue in this debate is about how to best measure good decisions. Over the years, psychologists have varied the decision-making benchmark between how people perform in the real world to achieve their goals and objectives (referred to as "rationality$_1$" by Mantkelow, 1999) and whether people live up to normative standards (referred to as "rationality$_2$" by Mantkelow, 1999). In order to be judged rational$_2$, a person would have to search indefinitely for endless amounts of information, have knowledge of every relevant aspect, weigh all the available information according to importance, and finally perform intractable mathematical and statistical calculations. (Such a person has been called *homo economicus*, or economic man.) If rationality is thought to be synonymous with optimality – which has often been the case – then unbounded models of this sort become the definition of rational thinking. People appear doomed to be irrational if such an unattainable standard is maintained.

Bounded rationality researchers have challenged the view of the human mind as a statistical software package (Gigerenzer, 2000; Kahneman & Tversky, 1973; Simon, 1955, 1956) by arguing that the natural constraints on decision making must be taken into account when assessing human rationality. These researchers proposed that heuristics are more psychologically plausible models of human decision making than those that involve a high degree of information integration and abstract mathematical assignments and calculations. Most

recently, Gerd Gigerenzer and his colleagues (e.g., Gigerenzer, Todd, & The ABC Research Group, 1999; Gigerenzer, 2001; Todd & Gigerenzer, 2000) have shown that heuristics are rational because they work well in natural environments.

We therefore adopt the rationality$_1$ definition, and measure rationality by how well people make decisions in the real world, where decision making is limited by available time, information or knowledge, and mental resources.

Historical Developments

While it is generally acknowledged that people use heuristics to make all sorts of decisions, the debate continues over whether their use leads to good or bad decisions. There were three especially influential contributions to this debate in the second half of the last century (see Gilovich & Griffin, 2002; Goldstein & Hogarth, 1997). First, Paul Meehl (1954) empirically compared the judgments of expert clinicians (which were presumably made with heuristics) with judgments reached by actuarial models and made two important discoveries. First, the actuarial methods almost always outperformed the experts. Second, the experts thought they performed better than they actually did. These two findings inspired further research on ways that the mind produces convincing but erroneous judgments. This further research generally supported Meehl's conclusions (e.g., Goldberg, 1965; Sawyer, 1966) that humans cannot reason as well as they should be able to.

Nobel Prize winning economist and cognitive scientist, Herbert Simon, refuted this conclusion because it suggested that humans are irrational. Simon thought that it might be the definition of rationality that was the problem and not human performance on judgment and decision-making tasks. Simon is now credited with developing the argument that the level of

rationality$_2$ suggested by rational choice models was an impractical standard for assessing human judgment and rationality. Proponents of rational choice models assume that people make judgments by evaluating the probability of each outcome, determining the utility to be gained from each outcome, combining these two evaluations, and then choosing the option that offers the optimal combination of probability and utility (Gilovich & Griffin, 2002). Simon (1955, 1956) was opposed to this classical criterion of full rationality, and proposed the principle of bounded rationality as a more realistic standard. According to Simon's view, judgment and decision making is constrained by the processing limitations of the mind so humans have evolved to use "simple" strategies that can handle complex information (see also Kahneman, 1973; Miller, 1956). Simon believed that humans are in fact rational considering that they make decisions under limited mental capacity and within the complexities of our uncertain world. He compared heuristics to a pair of scissors, where one blade represents the environment and the second represents the mind. Simon asserted that one must study how the two fit together, like the blades of the scissors, in order to appreciate how heuristics work.

The third important contribution to the rationality debate was the inception of Bayesian statistical analyses, a form of probability calculus, into the field of psychology by Ward Edwards (Edwards, Lindman, & Savage, 1963). The Bayesian models set a normative standard that heuristic-led judgments could be compared to (e.g., Edwards, 1968). Normative standards are those that establish how things should or ought to be, which things are good or bad, or which actions are right or wrong. Through such comparisons, it appeared that heuristic-led judgments were less than optimal because people never performed the way they ought to according to the idealistic benchmarks. An interest in the causes of this shortcoming subsequently emerged, as

well as interest in determining ways to correct the apparent "flaws" of human cognition (Gilovich & Griffin, 2002).

Heuristics and Biases

Following these developments, Daniel Kahneman and Amos Tversky published a series of papers about how heuristics can sometimes lead to errors and biases (e.g., Kahneman & Tversky, 1972, 1973; Tversky, 1972; Tversky & Kahneman, 1971, 1973; 1974; 2002). A collection of their works, along with articles of other like-minded researchers, appeared in a now classic book titled *Judgment Under Uncertainty: Heuristics and Biases* (Kahneman, Slovic, & Tversky, 1982). Its main message is that people often use heuristics rather than fully rational models to make judgments under uncertainty. The contributors proposed that heuristics can yield both good and bad decisions, challenged whether complex normative models of human judgment accurately described underlying mental processes, and attempted to explain the range of observed human errors as the systematic result of cognition without implying that humans are irrational (Gilovich & Griffin, 2002). This program of research became known as the "heuristics and biases" program.

They discovered that everyday judgments do not adhere to the laws of probability or to statistical principles and argued that the underlying processes in decision making were altogether different than those implied by rational choice models. They subsequently proposed that people employ a limited number of simple cognitive rules, or heuristics, that evaluate the likelihood of options using basic computations that the mind can perform. They proposed three judgmental heuristics – the *representativeness heuristic*, the *availability heuristic*, and the *anchoring and adjustment heuristic* – that are commonly used to estimate probabilities, frequencies, and values,

are cognitively cheap, and are usually effective (see Chapter 2 of this book for a discussion of how these heuristics have been observed in criminal investigative failures). Heuristics were defined as any automatic or deliberate strategy that uses a natural assessment in order to estimate or predict something. The representativeness heuristic, for instance, involves the classification of things based on how similar they are to a typical case. It is supposedly used when trying to determine the probability that object A belongs to class B. The subjective probability judgment rests on how representative object A is of class B. To use a criminal investigative example, when inferring whether a particular person is likely to be guilty, police officers might mentally compare the suspect to their perception of a prototypical offender. If the suspect does not show remorse, for example, a police officer might be inclined to believe the suspect is guilty (see Weisman, 2004, for a discussion of how showing remorse is interpreted by officials in the criminal justice system).

Kahneman and Tversky argued that *biases* occur because heuristics denote a tendency to make a choice that is inaccurate. For instance, the representativeness heuristic could yield an incorrect judgment if a suspect did not show remorse but was actually innocent, because a lack of remorse may not always indicate guilt (an innocent suspect might not show remorse). It was the tendency for different people to make remarkably similar errors on similar tasks, relative to the normative models, that led to the conceptualization of the three aforementioned judgmental heuristics. The predictability of the biases invoked research into the cognitive mechanisms that caused them – heuristics. However, the biases continued to receive most of the scholarly attention in the immediate years to follow. Although it was apparently not Kahneman and Tversky's intention (see Gilovich & Griffin, 2002), the disproportionate focus on the instances where heuristics lead to error, rather than the instances where they lead to good decisions,

combined with the continued scholarly acceptance that normative models were the most superior method of making decisions, appears to have produced the belief that heuristics are bad, a belief that still exists today. A negative image of human cognition was thus cast and the "cognitive miser" image was born (Fiske & Taylor, 1991). According to this image, humans are thought to deliberately sabotage their own accuracy by using heuristics because they are too lazy (or cheap) to carry out extensive computational processes. Research illustrating the fallibility of heuristics has now gained a strong foothold in many areas, including economics, medicine, politics, sports, and justice (see Myers, 2002, and Piattelli-Palmarini, 1994, for a list of the many documented heuristic-led biases).

The ABCs of Bounded Rationality

In recent years, Gigerenzer and his colleagues (e.g., Gigerenzer et al., 1999; Gigerenzer & Selten, 2001; Gigerenzer & Todd, 1999; Todd & Gigerenzer, 2003) at the Centre for Adaptive Behavior and Cognition at the Max Planck Institute for Human Development (hereafter referred to as the ABC Research Group) have been challenging the unbalanced view that heuristics are bad. Gigerenzer and Todd (1999) claim there is an unquestioned assumption in much of psychology "that the more laborious, computationally expensive, and *nonheuristic* the strategy, the better the judgments to which it gives rise" (p. 20, italics added). Those who compare human reasoning to the unrealistic benchmarks set by rationality$_2$ promote this "more-is-better ideology." The ABC Research Group do not believe that more is always better; in fact, they have argued that less is more in certain situations (Goldstein & Gigerenzer, 1999, 2002; Todd & Gigerenzer, 2003). In a compilation of their experimental findings and theoretical essays, titled *Simple Heuristics that Make us Smart*, Gigerenzer et al. (1999) maintain that the image of

humans as irrational, resulting from years of comparing human rationality to normative models, can be mended by considering the real and inherently uncertain environments in which people make decisions. Essentially, the ABC Research Group maintains that heuristic reasoning strategies have evolved over time not as suboptimal decision-making strategies, but as effective strategies that we can use to make everyday judgments and decisions in a complex world.

Two of the ABC Research Group's core concepts – bounded rationality and ecological rationality – capture their central ideas. Bounded rationality originated with Simon's (1955, 1956) notion of satisficing, which involves the mental or physical search through a series of alternatives until one is found that meets a certain pre-defined level – called the aspiration level. If you were searching for a house, for instance, you may decide you want a clean house in a suburban area that is below $300,000. It is possible that you would satisfice when choosing a house to buy because it is near impossible to look at all available houses everywhere and then select the best option. This means you would probably buy the first house that met your aspiration level.

Fundamental to the ABC Research Group's bounded rationality theory, and the most intriguing contribution to the ongoing debate about the validity of heuristics, is a metaphor which views the mind as an *adaptive toolbox*. Like a carpenter's toolbox, the mind is equipped with a repertoire of simple mental tools that are specially suited for certain judgments and decisions. These mental tools are *fast and frugal* heuristics that have evolved to allow people to make smart decisions. The heuristics are fast because they do not involve much calculation or integration of information, and frugal because they ignore some of the available information, thus sparing mental resources.

The simplest tool in the adaptive toolbox is the recognition heuristic, which leads people to choose something they recognize over something they do not recognize (Goldstein & Gigerenzer, 1999). As an example of how the recognition heuristic might be used to make a decision, consider this question: Which of these two National Hockey League players has achieved the highest total career points – Mark Messier or Eric Cairns? If you only recognize one player and not the other, you will use the recognition heuristic. Did you choose Mark Messier? Was it because you recognized Messier and not Cairns? If so, you made a correct inference by using the recognition heuristic (see Snook & Cullen, 2006). Given a set of options, the heuristics in the adaptive toolbox specify how people search through the attributes that are associated with the options, stop that search, and then make a choice. From this toolbox perspective, human decision making is adaptive because the mind is equipped with heuristics that meet the demands of a variety of decision tasks.

Ecological rationality is concerned with the structure and representation of information in the environment and how well heuristics match that structure. To the extent that such a match exists, heuristics allow people to make an accurate decision quickly (i.e., the heuristic is ecologically rational). By focusing on the match between the environment and the mind, the ABC Research Group have placed human reasoning into an evolutionary framework that is omitted from most decision-making theories. They do not define errors by how far the outcome and process deviate from rules specified by rational choice models. By contrast, they consider the ecological rationality of a strategy to assess whether it is effective in a particular situation. To continue with our hockey player example, the recognition heuristic is ecologically rational for this particular decision because good hockey players are more recognizable than bad hockey players. In addition to receiving media attention for being a good player, Messier also received

wide media exposure through his endorsement of Lays Potato Chips. Of course, Lays would not have hired an unrecognizable player in the first place. Essentially, people are able to capitalize on the fact that media exposure is a reflection of hockey greatness because the best players receive relatively more media exposure, and thus have a greater likelihood of being recognized.

Bounded rationality is based on the premise that our minds construct simplified models of the complex world in order to deal with uncertainty. The performance of these heuristics has been compared to complex methods in a series of studies. In perhaps the most comprehensive study, Czerlinski, Gigerenzer, and Goldstein (1999) compared the performance of simple heuristic models against multiple regression – a complex statistics-based model – in 20 different decision environments (e.g., predicting average attractiveness ratings of famous men and women). They found that the heuristic models provided an equally good fit to a range of data sets and tend to do so with fewer cues (i.e., they are more frugal). Similar results have been reported by Dhami and Harries (2001) in their study of how a group of general practitioners would decide to prescribe blood pressure medication, by Snook, Taylor, and Bennell (2004) in their study of how people predict offender home locations, by Dhami (2003) in her study of how judges make bail decisions, and by Smith and Gilhooly (2006) in their study of practitioners' decisions to prescribe anti-depressant medication. Taken together, these studies have shown that the fast and frugal heuristic models provide a psychologically plausible account of how people make all sorts of judgments and decisions.[1]

[1] Other researchers have also suggested that research on cognitive accomplishments has been "crowded out" by research on cognitive errors, and that statistical analyses typically focus on bias to the exclusion of accuracy. Krueger and Funder (2004), for example, argue that many "biases" can be beneficial and that when an analysis stops without asking "why" such a behavioural or cognitive tendency exists, or what general purpose it might serve, the development of integrative theory and sensible advice is stymied.

In sum, the rationality debate has a long history and is deeply entrenched in the field of psychology. Some researchers examine rationality by comparing human reasoning to lofty benchmarks that they believe people ought to achieve and, because people fall short of these normative benchmarks, conclude that cognition is flawed and people are unavoidably irrational (see Kahneman, Tversky, & Slovic, 1982; Piattelli-Palmarini, 1994). The natural response to this observed "irrationality" has been to prescribe corrective procedures to allow people to get closer to the benchmark. By contrast, the bounded rationality perspective is concerned with describing how decision-making strategies allow people to function in the real world. Bounded rationality researchers use ecological standards (accuracy, speed, frugality), rather than normative standards, to evaluate human rationality. By considering the nature of the situation in which a decision is made, it is possible to gain an understanding of when and why a particular heuristic is likely to succeed or fail in that situation.

Components of the rationality debate are clearly evident in the recent criminal justice literature that cites tunnel vision as a flawed mental process that produces criminal investigative failures. The basis of the specific arguments that tunnel vision is a mental virus is the same as that for the argument that heuristics lead to poor decisions – these strategies are too simple or they ignore information. Furthermore, in the current concern about tunnel vision, as well as in the broader debate, there has been a recognized need for corrective measures against heuristic use. Because the bounded rationality perspective has provided some insight for the greater rationality debate, it can also shed light on the way tunnel vision is currently viewed by criminal justice professionals.

Bounded Rationality and Criminal Investigations

Police officers work in an environment where they are expected to be fully rational.[2] This is especially the case when investigative failures come under direct public and legal scrutiny. When searching for suspects or through information about a set of existing suspects, police officers are expected to investigate all possible evidence and all possible suspects, explore all possible avenues concerning the circumstances surrounding a crime, search for disconfirming and confirming evidence, and make an optimal decision based on the information found (Forst, 2004; Goff, 2001; Innes, 2002). These expectations are similar to those placed on human decision making by proponents of rational choice models that assume that people have infinite time and ability to acquire and process all the information relevant to a particular decision. As previously mentioned, setting implausible information processing expectations can lead to the conclusion that the decision maker, in this case the police officer, is irrational, lazy, or used a flawed mental strategy. In other words, the expectation of optimal processing makes it seem like police officers are not doing their jobs properly.

According to the bounded rationality perspective, however, people always use heuristics to make decisions. To apply the bounded rationality framework to police decision making, one must consider whether a particular heuristic meets the demands of the criminal investigative environment.

The Bounded Investigative Environment and the Mind

The criminal investigative environment can be best characterized as a naturalistic decision setting. Such settings typically involve time pressures, high stakes, experienced decision-makers, inadequate (e.g., missing or uncorroborated) information, ill-defined goals,

[2] Or at least parrot the overtones of full rationality (Lerner, 2005).

poorly defined procedures, stress, dynamic conditions, team coordination, interruptions, distractions, noise, and other stressors (see Klein, 2001; Orasanu & Salas, 1993). When a crime is reported, police officers begin a search for information to identify and locate a primary suspect through physical (e.g., canvassing, interviewing witnesses), mental (e.g., linking related cases), and/or archival (e.g., searching police files) sources (de Poot & van Koppen, 2004; Sanders, 1977; Innes, 2002).[3] In a world without limits, an officer could conduct an infinitely large search of all information available in the universe. In reality, however, police officers do not have the luxury of unlimited search time. There are limitations, for example, on how many houses can be canvassed, how much comparative analysis can be done, and how much effort can be spent searching police records.

Criminal cases become harder to solve with time (Keppel & Weis, 1994; Mouzos & Muller, 2001), so many investigations are a race against the clock. *Time*, therefore, is the first major constraint on police decision making. Time constrains the search for information by influencing how resources are allocated, most notably the manpower required to manage investigative teams, interview witnesses, interact with other agencies, organize information coming into the investigation, respond to the media, and follow lines of inquiry (Eck, 1979). Police officers simply do not have time to search for all information that is relevant or necessary to make an optimal decision. In the end, time-limited searches influence the quality and quantity of information that is collected, organized, and processed.

The *resources* that are available during an investigation are also limited. Resource allocation in a police agency must be prioritized to ensure that all important functions of the agency continue to operate properly. There are limited financial resources available, and a

[3] See Maguire (2003) and de Poot and van Koppen (2004) for a discussion of how different types of crimes demand different search strategies that vary in complexity.

balance must be struck between, for example, personnel (e.g., overtime), equipment (e.g., radios), and new technology (e.g., forensic capabilities). Although agencies can sometimes obtain new resources at the start of a major investigation, these cannot be sustained indefinitely. As with time, resource limitations constrain the search for information that is used to make investigative decisions.

Similarly, there are limitations on *cognitive ability*, or constraints on the mental processing of information (e.g., Kahneman, 1973; Miller, 1956), that limit the decisions made by investigators. At the most basic level, information processing involves encoding, storing, and recalling information (Atkinson & Shiffrin, 1968). In order for relevant and novel information to be encoded and stored in the first instance, one must pay attention to that information. If attention is interrupted, by distraction for example, the encoding process can be disrupted and the information will not become stored in memory. In addition to inattention, there are a range of other limitations on information processing. For example, people can only hold an average of seven pieces of information in their short term, working memory store at any given time (Baddeley, 1992; Miller, 1956). The human mind, therefore, does not have the capacity to consider every piece of information, weight the importance of each piece of information, and integrate the information in a computationally expensive way. It is unrealistic, then, to expect a police officer's mind to act like a computer processor.

Nor should we expect police officers to have unlimited *knowledge* about every aspect of criminal investigations or have access to all of the information that is required to make a perfect decision. It is clearly impossible for police officers, or anyone else for that matter, to be fully familiar with, aware of, or completely understand criminology, forensics, psychology, law, biology, sociology, anthropology, linguistics, chemistry, statistics, ethics, politics, management,

and other areas that could be required to effectively investigate crimes. Knowledge is gained through experience or study. Police officers accumulate their criminal investigative knowledge through experience gained from working a range of different cases, through training and self-study, and by interacting with and listening to other investigators.

The decisions detectives reach are also contingent upon both the quantity and the quality of information about the current investigation. Police officers, for example, may have only one eyewitness account of a crime, but must use that limited, and often ambiguous, information to make investigative decisions (see Manning, 1977; Sanders, 1977). Even if numerous eyewitnesses come forward, the knowledge they provide is still limited by the fallibility of human memory (Sporer, 1996).

In addition to the four major constraints, police officers experience pressure from internal and external sources that can influence the types of decision-making strategies that work well in the investigative environment (Findley & Scott, 2006; Maguire, 2003). For example, Crego and Alison (2004) conducted electronic focus groups with 28 senior investigating officers (SIOs) in the United Kingdom for a range of different types of serious inquiries (e.g., child abductions, stranger rapes). The officers reported the types of issues they believed were important features of the critical incidents they had managed. Of the wide range of issues the SIOs reported having to deal with, several of them were identified as placing considerable stress on the inquiry process. The officers felt pressure because of the consequential nature of the decisions they make that can affect people's lives, the complexity of the case, the local community's concerns, the involvement and scrutiny of the press, the inability to influence other individuals that can have an impact on the investigation, the managing of the investigative team, the ever-changing nature of the investigation, and their belief that they will be blamed for anything that goes wrong.

Police are, furthermore, expected to deal with these pressures amid the regular constraints of the political and legal systems (Lyons & Truzzi, 1991; Goff, 2001; Young, 1996).

Now that the constraints on investigative decision making have been highlighted, it is necessary to develop a clear definition of tunnel vision in order to determine whether it is likely to be an effective strategy in the investigative environment.

Tunnel Vision: Narrow-Mindedness or Focused Determination?

In biological terms, tunnel vision refers to a reduced field of vision – as from within a tunnel looking out – that results from the loss of peripheral vision with retention of central vision (Williams, 1985). A Google search of "tunnel vision" retrieves over 14 million hits, however, and a quick scan of these shows that the term is often used metaphorically to describe how people in a range of domains (e.g., medicine, politics, law, and business) search for information. Tunnel vision in this sense is generally seen as a negative or undesirable process, as it refers to the narrow-minded pursuit of evidence that supports a decision that has already been made while ignoring evidence that may contradict that initial decision. The main argument against tunnel vision is that some of the ignored evidence may be valid and people should therefore allow their beliefs to change in accordance with that evidence. Like the proponents of rationality$_{2,}$ some criminal justice pundits appear to believe that a different investigative process, involving the collection and consideration of all available evidence, is superior to this "narrow-mindedness." But tunnel vision can also be cast in a positive light; it can be interpreted as an adaptive process whereby people focus on important, relevant evidence while ignoring evidence that distracts them from making a decision and acting upon it (Lewicka, 1998). This optimistic view implies "focused determination," a desirable human characteristic. Regardless of whether one takes a

pessimistic or an optimistic stance, the metaphorical tunnel vision appears to be referring to a cognitive strategy, albeit an ambiguous one, that guides the search for alternatives and information.

Tunnel vision has become a convenient catchphrase in the field of criminal justice to refer to how the police locate suspects and build a case against them. Published articles, books, and judicial inquiries about wrongful convictions in Canada, such as the Donald Marshall, David Milgaard, Wilbert Coffin, Steven Truscott (Anderson & Anderson, 1998), Guy Paul Morin (Anderson & Anderson, 1998; Epp, 1997), and Thomas Sophonow (Anderson & Anderson, 1998; Cory, 2001; Wilson, 2003) cases all cite police or prosecutorial "tunnel vision" as a contributing factor. In addition, the *Canadian Journal of Criminology and Criminal Justice* dedicated a special issue in 2004 to wrongful convictions, and the FPT Committee, discussed earlier in this chapter, identified "tunnel vision" as one of the contributors to wrongful convictions.

Although these different published works defined tunnel vision in slightly different ways, most of the definitions assume that tunnel vision is a form of police misconduct. Even authors who have attempted to define tunnel vision objectively, by referring to it as the natural way of processing information that is gathered during an investigation (e.g., Findley & Scott, 2006; Wilson, 2003), have still cast tunnel vision in a negative light by implying that it is a suboptimal or flawed investigative strategy. No one appears to have considered that tunnel vision might be a cognitive strategy that serves a useful purpose for criminal investigators. Below are some of the definitions that have been provided, which illustrate two things: (1) a lack of agreement about what exactly tunnel vision is; and (2) the confounding of police misconduct with systematic cognitive processing.

Perhaps the most widely cited definition of tunnel vision is that provided by Justice Cory in relation to the wrongful conviction of Thomas Sophonow (Cory, 2001). Cory stated that:

> Tunnel vision is insidious. It can affect an officer or, indeed, anyone involved in the administration of justice with sometimes tragic results. It results in the officer becoming so focussed upon an individual or incident that no other person or incident registers in the officer's thoughts. Thus, tunnel vision can result in the elimination of other suspects who should be investigated. Equally, events which could lead to other suspects are eliminated from the officer's thinking. Anyone, police officer, counsel or judge can become infected by this virus.

Kennedy (2004), a defence lawyer who has assisted with the exoneration of several wrongfully convicted individuals, argued that "police misconduct, which takes the form of overzealous and shoddy investigative practices, and specifically "tunnel vision" (p. 200), is the most significant factor leading to wrongful convictions. To this, Kennedy added:

> Tunnel vision can result from incompetence, negligence, or simply a desire to secure a conviction at any and all costs. It may occur when a police officer, Crown counsel, or judge believes, prior to the presentation of all the evidence, that the defendant is guilty… Tunnel vision leads to the use of worthless evidence, the consideration of erroneous forensic science, and a reliance on the testimony of jailhouse informants (pp. 200-201).

According to the FPT Committee (2004), tunnel vision is:

> the single minded and overly narrow focus on an investigation or prosecutorial theory so as to unreasonably colour the evaluation of information received and one's conduct in response to the information. Tunnel vision, and its perverse by-

> product "noble cause corruption," are the antithesis of the proper roles of the police and Crown Attorney. Yet tunnel vision has been identified as a leading cause of wrongful convictions in Canada and elsewhere (p. 35).

McFarlane (2004) suggested that tunnel vision occurs when the:

> investigative team focuses prematurely, resulting in the arrest and prosecution of a suspect against whom there is some evidence, while other leads and potential lines of investigation go unexplored (p. 40).

Findley and Scott (2006) argued that tunnel vision is:

> a natural human tendency that has particularly pernicious effects in the criminal justice system. By tunnel vision, we mean that "compendium of common heuristics and logical fallacies," to which we are all susceptible, that lead actors in the criminal justice system to "focus on a suspect, select and filter the evidence that will 'build a case' for conviction, while ignoring or suppressing evidence that points away from guilt." The process leads investigators, prosecutors, judges, and defence lawyers alike to focus on a particular conclusion and then filter all evidence in the case through the lens provided by that conclusion. Through that filter, all information supporting the adopted conclusion is elevated in significance, viewed as consistent with the other evidence, and deemed relevant and probative. Evidence inconsistent with the chosen theory is easily overlooked or dismissed as irrelevant, incredible, or unreliable. Properly understood, tunnel vision is more often the product of the human condition as well as institutional and cultural pressures, than of maliciousness or indifference (p. 292).

Martin (2004) stated that tunnel vision is:

> a set of preconceptions and heuristics that causes police investigators to select evidence to build a case for the conviction of their chosen suspect while suppressing or ignoring information and interpretations that point away from guilt.

Lastly, Wilson (2003) stated that:

> We have to remember that wrongful convictions do not happen out of malice. I have never met a policeman who has deliberately tried to frame an innocent man – this is not how wrongful convictions occur. Instead, investigators become convinced of the guilt of people like Mr. Sophonow because the evidence itself appears to be so convincing. It is crucial to remember that the case against an accused, on the evidence, can be extremely compelling and yet the accused may be innocent (p. 5).

Some of these definitions clearly imply police misconduct, as evidenced from the phrase "noble cause *corruption*" in the FPT Committee's report, where a conviction is knowingly obtained under falsehoods or improper procedures because the police and/or prosecutor believe the accused to be guilty. By observing in hindsight a case that ended in a wrongful conviction and noticing that information was ignored during the investigation, it is not surprising that police misconduct and tunnel vision might be viewed synonymously. Ignoring information certainly could be the result of either misconduct or tunnel vision. But, it does not necessarily follow that misconduct is to blame each and every time that an investigator ignores a piece of information. It is our contention that these are two totally separate concepts that have been confounded. Whereas malicious investigators may intentionally build a case against a suspect irrespective of their guilt, detectives using tunnel vision really believe their primary suspect is responsible for

the crime. It is this belief that causes them to ignore some information – that which simply does not register in their thoughts because it does not fit with the story they developed through their interpretation of the evidence. Or if it does register, it might be "explained away" on the basis of the investigator's experience or the other evidence in the case. Tunnel vision, in our view, guides information search in complex, uncertain, and pressure-filled situations. Ignoring some information is an integral part of all heuristic strategies. Once it is agreed that misconduct and tunnel vision are separate processes, we can begin to understand whether tunnel vision is really a flawed cognitive strategy.

Despite the ambiguity associated with tunnel vision, there have been several recommendations to remove tunnel vision from the investigative process (Cory, 2001; Findley & Scott, 2006; FPT Committee, 2004; McFarlane, 2004). Such recommendations and concerns, however, have been raised despite any compelling empirical evidence that tunnel vision is maladaptive or even that it *can* be avoided. This type of recommendation is referred to as "common-sense" based (Gendreau et al., 2002). Before such policy recommendations can be implemented with any degree of confidence, they must be validated by systematic research. Indeed, there are many questions about tunnel vision that remain unanswered. For example, how often is tunnel vision used? When does tunnel vision lead to good decisions? When does tunnel vision lead to bad decisions? Why does it work? Why does it fail? How often does tunnel vision lead to successful criminal investigative outcomes? How often does tunnel vision lead to criminal investigative failures? Is it realistic to expect the police to follow all lines of inquiry even if they have a viable suspect identified? How many suspects should the police consider? When should they stop searching for suspects? How much evidence is required to define a prime

suspect? How should police officers choose between equally viable suspects? Perhaps to start we should ask: What exactly is tunnel vision?

Operationalizing Tunnel Vision

Even though tunnel vision has often been blamed for investigations going awry, the concept has not been defined in a way that allows it to be meaningfully studied and scrutinized. Cognitive strategies are normally defined in a way that clearly outlines the step-by-step process (e.g., an algorithm) that leads to a decision. This has never been done for tunnel vision, however.[4] In this section, we will discuss a number of mental strategies that could potentially comprise tunnel vision. Each heuristic may serve as a useful function in human cognition – and in criminal investigations.

Judgment and decision making research provides at least four heuristics that may account for a portion of the process that is commonly referred to as tunnel vision: (1) the *satisficing heuristic*; (2) the *take the best heuristic*; (3) the *elimination-by-aspects heuristic*; and (4) *confirmation bias*. Satisficing is a heuristic that may potentially be used to guide the search for a primary suspect by ignoring some of the available information. The next two heuristics, which also ignore some of the available information, can potentially be used to select a suspect from a list of known suspects. Each of these three heuristics form part of the adaptive toolbox in the bounded rationality framework and each involves rules for how to search for information, stop that search, and make a decision. They have been proposed by bounded rationality researchers as alternatives to rational$_2$ models. In experiments where decisions made with these models are compared to decisions made using complex models, the simple models perform at least as well

[4] While Findley and Scott (2006) argue that tunnel vision is multidimensional and allude to the idea that it is made up of heuristics, they draw upon vague cognitive tendencies in their attempt to operationalize tunnel vision.

and even better in some situations (e.g., Dhami, 2003, Gigerenzer, 2000). Confirmation bias is involved during the building of a case against a suspect whom is believed to be the offender. This is a psychological tendency that occurs when people attempt to support and defend their decisions, but it can also be viewed as a component of the decision-making process. Arguably, each of these psychological mechanisms (and other seemingly irrational strategies) serve adaptive functions in human cognition. Evolutionary psychology maintains that, otherwise, these mental tools would have been eliminated from our minds.

Satisficing, briefly discussed earlier, is a term that was introduced to the decision making literature by Simon in the 1950s. It is actually a term that conveniently combines "satisfy" and "suffice," and essentially means looking for a good-enough option rather than the best option when making a decision. The satisficing heuristic involves the sequential consideration of options until one is found that appears to meet a certain aspiration level. Once that option is chosen, no further options are considered. Within the context of a criminal investigation, suspects are usually discovered one at a time and considered in that order. Police officers will compare all relevant evidence on each suspect to the pre-defined level of evidence that, in the police officers' experience, is an indication of guilt. Any suspect that does not meet the aspiration level is rejected and one primary suspect (the first suspect that meets all the aspiration levels) emerges. If no suspects meet all the desired levels of evidence, the level of evidence required may be relaxed and the process repeated, or the suspect who comes closest to the aspiration level may be chosen. For example, a detective investigating a murder may determine that the likely offender is a Caucasian male between 18 and 25 years of age, who lives near the crime scene, has a previous conviction for burglary, and knows the victim. According to the satisficing heuristic, the first suspect encountered *that satisfies all these bits of information* (not

simply the very first suspect who is encountered) will suffice as the primary suspect and the search for other suspects is then ceased. In actuality, however, more than one suspect might meet the aspiration level. Other heuristics might be used to choose the best suspect from that set of possible suspects.

In the example about purchasing a house that was discussed earlier in this chapter, it can be seen that satisficing may not always lead to the best possible choice. After you purchase a house that meets all of your criteria, you may continue to browse the market only to find a better house with a nicer view than your new home. This is a prime example of the type of situation that is the basis of the rationality debate. Satisficing is a rational$_1$ strategy that allows us to make decisions in complex situations where there are so many factors involved that it would be impossible to integrate them all into a decision. Yet using it might cause one to make a sub-optimal (irrational$_2$) choice. So a rational strategy produces an apparently irrational result. But, satisficing allowed the home buyer to reach a good enough decision, which meant that the process of buying a house could move forward. Therefore, using the satisficing heuristic aided the achievement of the home buyer's primary goal. Only in hindsight can it be learned that this house may not have been the best choice. In criminal investigations, however, the situation is different. There is a "right answer," that is, there is normally just one suspect who is responsible for a crime in question. But police officers probably use this heuristic nonetheless. It involves setting standards and making sure those standards are met before coming to a final conclusion. The standards are based on training and experience with similar crimes. This allows investigators to make a decision and move the case forward. What better strategy is there? If the evidence points to a suspect, and the police wrongly conclude the suspect is the rightful offender, this may be an error but it is not an irrational conclusion because the detective followed the

evidence. In such a situation, it would be interesting to determine whether other investigators (or anyone else) would also have followed the same line of inquiry and chosen the wrong suspect.

The *take the best heuristic* (TTB) makes decisions on the basis of just a few pieces of data and ignores the rest of the available information (Gigerenzer, 2000; Gigerenzer, Hoffrage, & Kleinbölting, 1991). The recognition heuristic, described earlier in this chapter, is a simplified form of TTB in which decisions are based on recognition. Options that are not recognized are eliminated as potential choices. Recall that the recognition heuristic is only used to make a final decision when only one option is recognized. In other situations, recognition is used as a preliminary cue to eliminate some options before additional information is considered. Informational cues pertaining to the remaining options are then considered in a manner that involves considering the "best" (most subjectively valid) cue first, then the second best, and so on, until a cue is found that discriminates between the options.

For police officers assessing whether a case can be built against a suspect, these cues might include motive, alibi, and prior criminal record, although the specific factors will vary because there is an element of uniqueness in each case. It is assumed that the list of all potential suspects is available prior to determining the primary suspect. The police would then evaluate the motives of the potential suspects, eliminating any who had no motive. They would then do the same for alibi, then prior criminal record, and other information, until only one suspect remains. This description of TTB assumes that all cues are binary (present or not present), but the heuristic can also be generalized in such a way that it considers the values of the cues (Gigerenzer, 2000) such as the strength of the alibi or the degree of prior criminal activity. In any case, TTB involves making a decision by only considering enough information to distinguish

between options. Some information is simply not used although it may be available, hence TTB is often referred to by the slightly longer name, "take the best, ignore the rest."

The *elimination-by-aspects (EBA) heuristic*, originally proposed by Tversky (1972), is similar to TTB except that it considers the values of the cues (e.g., degree of prior criminal activity). The most important piece of evidence is determined, a cut-off value is set, and suspects are rejected if they do not surpass the cut-off level. This process is repeated with the second most important piece of evidence, and so on, until only one suspect is left. For example, the major crime investigator may have four possible suspects and they may all have alibis (which the investigator believes to be the most important piece of evidence in the case), but one may have a weaker alibi than the rest. Like TTB, this heuristic does not require considering all pieces of information when choosing a primary suspect.

Once a primary suspect has been selected, the objective of an investigator is to build a case against that person for the prosecution. Attempting to find information to support a belief is commonly referred to as *confirmation bias*. Confirmation bias, by definition, is a type of information search strategy whereby people look for information to confirm their beliefs, theories, or hypotheses, and avoid or misinterpret contradictory evidence so that it does not disconfirm their beliefs (Arkes & Harkness, 1980; Evans, 1989; Lewicka, 1998; Nickerson, 1998; Wason, 1960). The confirmation bias as it is currently explained in the literature, then, refers to two separate mechanisms: (1) selective (confirmatory) information search; and (2) biased interpretation of information (so that it does not disconfirm our beliefs).

Confirmation bias has been called both a "ubiquitous phenomenon" (Nickerson, 1998) and the primary bias (Klein, 2001). These authors have observed that all people have a tendency to search for information that confirms their beliefs – a tendency that appears to play a role in

many aspects of human cognition. Indeed, the scientific method is designed as an attempt to overcome confirmation bias – by teaching scientists to seek evidence that disconfirms theories. Klein (2001), however, noted that one of the most common strategies of scientific research is to derive a prediction from a theory and show that it is accurate, thereby strengthening the reputation of that theory. Interviews with prominent and successful NASA scientists (Mitroff, 1974) revealed that a number of them were committed to confirming their theories and saw this type of strategy as both desirable and necessary. These scientists claim that seeking confirmatory evidence is necessary for the development and refinement of new theories. Other researchers have also shown that scientists and other expert professionals do not always search for disconfirmatory evidence (Greenwald, Pratkanis, Leippe, & Baumgardner, 1986; Haverkamp, 1993; Mahoney & DeMonbreun, 1977). Mahoney and DeMonbreun (1977), for instance, revealed that the reasoning skills of 15 psychologists and 15 physical scientists (all with PhDs) did not differ from the reasoning skills of 15 conservative Protestant ministers. When successful scientists use confirmation seeking strategies, the strategies are perceived as a sign of persistence or focused determination. Ironically, however, some scientists criticize their research subjects for using similar strategies on judgment and decision-making tasks.

These arguments can similarly be applied to the criminal investigative context. Officers who build *a successful case* by searching for evidence that supports their belief while ignoring evidence that contradicts their belief would likely be applauded for being persistent, focused, determined, and dedicated. Those who use the same strategy in *a case that ends in a wrongful conviction*, on the other hand, might be accused of using confirmation bias (or perhaps tunnel vision), as though they neglected to properly fulfill their duties. The confirmation bias is said to violate the "fully rational" expectation that police officers should search for endless amounts of

evidence or falsifying evidence in a totally objective manner, weigh and combine it all, and then make the best decision. It appears that the outcome of the investigation (rather than how well it was conducted) is the primary determinant of whether or not the investigative process is criticized.

If confirmation bias is a conscious strategy, then it should be possible to teach people not to use it. However, people may seek confirmatory evidence unconsciously rather than consciously. Mynatt, Doherty, and Tweney (1977, 1978) trained participants on a falsification technique and an alternate hypotheses technique and found that it did not decrease the prevalence of confirmatory seeking behaviour when testing hypotheses. The researchers also discovered a counterintuitive finding – a few participants were actually led astray by the search for disconfirming evidence (i.e., the falsification technique). Such research suggests that even individuals who are explicitly trained to make decisions and test hypotheses in a fully rational manner, using normative strategies, often fail to do so, and training people to use "optimal" search strategies can sometimes result in worse decisions. Mynatt et al. further found that promising, but partially incorrect, hypotheses were quickly abandoned when disconfirmation was received, and participants turned to other hypotheses that were much further from the solution they were trying to find. So, while searching for confirmatory evidence might increase the likelihood of supporting a prior belief, it does not completely rule out the possibility that disconfirmatory evidence might also be discovered.

Tunnel vision appears to consist of a set of heuristics because, by definition, some of the available information is ignored. There are many documented heuristics that people can use to search for information, end that search, and make a decision. We have proposed just four that may comprise the concept of tunnel vision, as currently used in the criminal justice literature, to

illustrate the importance of operationalizing concepts in a way that allows them to be empirically tested. Experimental methods already exist for testing the four strategies we have presented, whereas tunnel vision appears to be an ambiguous catchphrase that currently cannot be subjected to the appropriate testing that would be required to determine its actual role in criminal investigative successes and failures.

Conclusion

In our opinion, there is a gap between the reality of how police officers make decisions and how the criminal justice system (and the general public) expects them to make decisions. Given the uncertain, dynamic, and pressure-filled nature of criminal investigations and the demands of the adversarial justice system, it is not reasonable to recommend that police officers use "optimal" decision-making strategies. Just like a substantial number of psychological researchers over the past several decades, those who cite tunnel vision as a cause of wrongful convictions have made a very important oversight – investigative decisions are made by humans in the real world, not by supercomputers in some ideal place where time, knowledge, and resources are unlimited. Decision-making strategies that ignore information, including the heuristics that comprise tunnel vision, are thus more psychologically and ecologically plausible than those that strive for optimality.

Unfortunately, policy recommendations to eliminate wrongful convictions by eradicating mental viruses are not based on any hard facts. Empirical research on the nature of tunnel vision should be conducted before concluding it causes criminal investigative failures. Comparative research is required to examine, for example, the prevalence of tunnel vision in criminal investigations that resulted in both wrongful *and* rightful convictions. Only then can it be stated

with any certainty whether using tunnel vision is a poor way to approach investigative decision making. Perhaps tunnel vision is used by investigators in every case, but only a very small percentage of these result in wrongful convictions. This cannot be determined from the present criminal justice literature because only investigative fiascos have been examined. That is not to say that the analysis of investigative fiascos is not a useful starting point for identifying the possible causes of wrongful convictions. Before the apparent use of tunnel vision is used to drive policy recommendations, however, systematic research demonstrating the role of tunnel vision in criminal investigative failures is needed.

Ironically, it seems to us that everyone uses tunnel vision, including those who have argued that tunnel vision is a flawed mental strategy (by presenting only anecdotes that seem to support their arguments). Some of the authors that we cite seem to have ignored research that might disconfirm or weaken their arguments. Findley and Scott (2006), for example, made an argument about tunnel vision that was similar to ours. Like us, they argued that tunnel vision does not result from malice, and is comprised of heuristic processes. They made their argument by focusing on the heuristics and biases literature, however, and appear to have ignored, or perhaps did not search, the bounded rationality literature. The former generally claims that heuristics are bad, while the latter argues their use can lead to smart decisions. Findley and Scott then criticize police officers for using tunnel vision and recommend that officers think more critically when making investigative decisions. This is where our views deviate from that of many other researchers. By incorporating bounded rationality research into the picture, we have argued that heuristics, including tunnel vision, might be adaptive processes that allow people to function in a complex world. According to this view, asking police officers to avoid tunnel vision might not be a feasible recommendation. Moreover, because tunnel vision helps police

officers achieve the positive goal of remaining focused, avoiding tunnel vision may not even be desirable.

We admit that even we used tunnel vision when we wrote this chapter. Our approach was to come to a conclusion regarding the use of tunnel vision through our psychological and legal knowledge and then proceed to construct a rationale for these conclusions by searching for evidence that supported them. But we were not intentionally trying to mislead anyone when we chose not to include arguments from some sources. It is simply not feasible to incorporate every argument that could potentially have an impact on this chapter. We strongly believe, furthermore, that the bounded rationality approach currently holds the most promise for understanding human decision making. Of course, if you read this chapter and give it a positive evaluation, then you will probably conclude that our approach was good, whereas if you do not agree with our position, you will probably accuse us of being biased. Although we may be criticized for doing so, we are openly admitting that we used a tunnel vision approach to build our argument because: (1) our knowledge of this area allows us to believe that we are presenting a valid argument; and (2) confirmatory strategies have been argued to serve an adaptive purpose in human reasoning.

In conclusion, the main goal of this chapter is to stop the spread of the idea that heuristics are inevitably flawed. We recommend that people always consider the positive objectives that heuristics might serve before concluding that people are irrational, lazy, or mentally inept. We hope this chapter will help contribute to the larger, ongoing counter-revolution aimed at balancing the view of the role and value of heuristics in human decision making.

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Authors' Note

Correspondence: Brent Snook, Psychology Department, Science Building, Memorial University of Newfoundland, St. John's, Newfoundland, Canada, A1B 3X9. Telephone: (709) 737-3101; facsimile: (709) 737-2430; e-mail: bsnook@play.psych.mun.ca.

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Biographies

Brent Snook is an Assistant Professor and Director of the Bounded Rationality and the Law Laboratory at Memorial University of Newfoundland. He obtained his PhD at the University of Liverpool, United Kingdom. Brent's research primarily involves the study of bounded rationality and the law. He is particularly interested in the types of simple heuristics that people use to make consequential decisions in legal settings, when and why those heuristics work succeed and fail, and the conditions under which simple heuristics are used. His research interests also include pseudoscience in the criminal justice system.

Richard M. Cullen is a graduate student at Memorial University of Newfoundland. He obtained his BSc (Honours) from Memorial in 2005. His general research interests include bounded rationality, forensic psychology, and social cognition. Richard's recent research involves the development of a model that explains how people form beliefs about investigative techniques in the absence of compelling empirical evidence. His graduate work involves studying evidence for the usage of simple heuristics in legal decision making.