

Criminal Investigation:

Motivation, Emotion and Cognition
in the Processing of Evidence

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Doubt is not a pleasant condition,

but certainty is absurd.

Voltaire

Abstract

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This thesis examines biases in judgments made in the context of criminal investigation, drawing theoretically on frameworks developed in social and cognitive psychology. **Study I** investigated the existence of confirmation bias in the interpretation of criminal evidence, and the need for cognitive closure (NFC) as a potential moderator. In two experiments, criminal investigators ($N = 50$) and undergraduate students ($N = 68$) were presented with one of two alternative hypotheses regarding a homicide case, and then read the same set of evidence from the investigation. Students displayed the predicted confirmation bias, interpreting the evidence in line with their initial hypothesis. In contrast, criminal investigators made incriminating interpretations of the evidence across conditions. Investigators high (vs. low) in NFC were somewhat more likely to identify exonerating information when it confirmed their hypothesis, but somewhat less likely when the information disconfirmed their hypothesis. In **Study II**, the notion that non-preferred (vs. preferred) witness evidence is more thoroughly scrutinized was tested. Criminal investigators ($N = 49$) rated their perception of a witness who either confirmed or disconfirmed the focal hypothesis of a homicide investigation. As predicted, the hypothesis-inconsistent witness was seen as providing a less reliable statement, although its background and witnessing conditions were identical to those of the hypothesis-consistent witness. High- (vs. low-) NFC investigators were less likely to accommodate their perception of the case to the witness evidence, indicating a stronger tendency to preserve their initial belief. Drawing on previous research on the hindsight bias, **Study III** tested the hypothesis that the identification of the suspect in a lineup (positive outcome) would increase the perceived suggestiveness of the lineup, whereas a non-identification (negative outcome) would decrease perceived suggestiveness, relative to no outcome knowledge. In a first experiment, undergraduate students ($N = 50$) showed the predicted influence of positive, but not negative, outcome. In a second experiment, where the lineup was presented as part of a case material, police trainees ($N = 126$) displayed the expected influence of negative, but not positive, outcome. In **Study IV**, the appraisal tendencies associated with anger and sadness were expected to (a) shift investigators' attribution of witness-statement reliability towards either witness variables (anger) or witnessing-situation variables (sadness), and (b) promote either a heuristic (anger) or systematic (sadness) processing of the witness evidence. Experimental data from criminal investigators ($N = 61$) showed that, when judging statement reliability, sad participants relied on their perception of both witness and situational variables, whereas angry participants relied only on witness variables. Sad participants were sensitive to the consistency of the statement with the central hypothesis of the investigation, indicating systematic processing, whereas angry participants were not, indicating heuristic processing. Taken together, the research in this thesis suggests that investigative judgments are susceptible to motivational, emotional, and cognitive biases. This calls attention to the necessity of developing safeguards against excessive influence of subjective factors in criminal investigations.

Keywords: Criminal investigation, Motivation, Emotion, Hindsight bias, Police, Investigative psychology, Evidence

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List of Publications

This thesis consists of a summary and the following four papers, which are referred to by roman numerals:

- I. Ask, K., & Granhag, P. A. (2005). Motivational sources of confirmation bias in criminal investigations: The need for cognitive closure. *Journal of Investigative Psychology and Offender Profiling*, 2, 43-63.
- II. Ask, K., & Granhag, P. A. (in press). Motivational bias in criminal investigators' judgments of witness reliability. *Journal of Applied Social Psychology*.
- III. Ask, K., & Granhag, P. A. (2006). *Perception of lineup suggestiveness as a function of identification outcome*. Manuscript submitted for publication.
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Table of Contents

INTRODUCTION	1
THE CRIMINAL INVESTIGATION PROCESS.....	2
Hypothesis Testing and Story Construction.....	3
Investigative Psychology	4
External Pressures in Investigative Work.....	6
MOTIVATED COGNITION.....	7
Accuracy Goals.....	8
Closure Goals.....	9
Directional Goals	10
Mechanisms of Motivated Cognition.....	11
EMOTION AND COGNITION.....	17
Valence-Based Approaches	18
Cognitive-Appraisal Models	21
Implications for Investigative Psychology.....	25
HINDSIGHT BIAS	27
Basic Research.....	28
Hindsight Bias in Legal Contexts.....	29
SUMMARY OF EMPIRICAL STUDIES.....	32
Study I	32
Study II.....	35
Study III.....	37
Study IV	40
GENERAL DISCUSSION.....	43
Main Findings and Practical Implications	43
Limitations.....	48
Future Research.....	51
Normative Considerations	53
Conclusion.....	54
REFERENCES	55
APPENDIX.....	68

INTRODUCTION

The police constitute the ultimate extension of the legal system to the individual citizen and are the most visible symbol of the law. Similar to other legal institutions, the overarching goal of the police authority is to maintain justice and safety. To this end, police officers are set to perform a variety of activities, ranging from crime prevention to the apprehension of offenders. Perhaps the most complex and psychologically intriguing of these tasks is the investigation of crime. Successful criminal investigation effectuates justice and safety through primarily two mechanisms: It allows for the prosecution and punishment of individuals who do not adhere to the law, and increases clear-up rates, which deter potential criminals from engaging in illegal activities.

In recent years, severe criticism has been passed on the police and prosecution authorities for their investigative practice (Bayley, 1994; Holgerson & Hellbom, 1997; Sefastsson, in press; Sjöberg, 2003). This critique largely stems from a number of controversial cases, characterized by either an inability to solve serious crimes or the conviction of individuals later found to be innocent. A striking resemblance can be identified between different critical accounts: They seem to imply that investigators have been overly focused on confirming a single hypothesis regarding the investigated crime. As a consequence, it is argued, alternative explanations of the available evidence have not been properly investigated. Without commenting on the validity of the critique pertaining to any particular case, the multitude of similar observations underscores the need to take the problem of investigative biases seriously.

In order to gain a better understanding of the criminal investigation process, and prevent serious malpractice from reoccurring, it is essential to study the psychological underpinnings of investigators' judgments and decision-making. Furthermore, it is necessary to identify the sources and cognitive mechanisms through which biases operate. In this thesis, I argue that a significant contribution towards these objectives can be accomplished by applying basic theoretical frameworks in social and cognitive psychology to the analysis of criminal investigation. This approach helps pinpointing how and why certain circumstances in investigators' work environment occasionally may cause investigations to go awry. A basic assumption of this analysis is that subjective, extralegal factors may color the process and outcome of investigative judgments. I will focus particularly on three classes of such factors: First, external pressures (e.g., time pressure, workload) placed on police officers are likely to create motives and preferences regarding the outcome of investigative activities. Such motivational forces may, in turn, influence the search for and interpretation of criminal evidence. Second, police officers' frequent encounters with criminal and harmful events can provoke strong, negative affective reactions. The experience of emotions has the potential to substantially influence human cognition. Third, some investigative tasks involve judging the probability of an event before and

after the outcome is known (e.g., a witness' identification in a lineup). Outcome knowledge is known to inflate the perceived predictability of the observed outcome, which may cause undue differences in investigators' foresight and hindsight judgments.

The thesis is organized as follows: First, I present a brief overview of the existing literature on criminal investigation. This overview will set the stage for later sections by describing the principal function of criminal investigation, defining the scope of the research field known as "investigative psychology", and identifying external pressures inherent in investigators' work environment. In the following three sections, I describe previous theoretical and empirical work on motivated cognition, emotion and cognition, and hindsight bias, respectively. At the end of each section, I make predictions as to how the respective phenomenon might manifest itself in the work carried out by criminal investigators. The fifth section summarizes the empirical research of the dissertation that tests some of the predictions presented in the preceding sections. Finally, the results are discussed in terms of practical and theoretical implications, as well as directions for future research.

THE CRIMINAL INVESTIGATION PROCESS

Criminal investigation is, in essence, the process of answering questions as to if, how, where, when, why, and by whom a crime was committed (Greenwood, Chaiken, & Petersilia, 1977). To this end, investigators must assemble clues from various sources and arrive at a coherent account of the critical event. Although it is important to understand as completely as possible the circumstances surrounding a crime, this is not an end in itself. In Sweden, and in nations with an adversarial judicial system (e.g., the UK, the US), the official purpose of criminal investigation is to retrieve information that can be used as evidence in court (Bring, Diesen, & Schelin, 1999; van Koppen & Penrod, 2003). The obtained evidence then becomes the basis for judges' and juries' decisions concerning the guilt of prosecuted defendants and the sentences imposed on those found guilty. From the above description it is evident that investigative activities cannot be fully understood if viewed detached from its context, but should be seen as intertwined with other components of the criminal justice system. Therefore, it is helpful to consider how investigators' work relates to the prosecution process. In a prosecutor's application for a summons, a claim is to be made concerning the criminal behavior of a defendant in the past. A prerequisite for issuing a summons is, first and foremost, that the identity of the defendant is clear. Furthermore, the criminal act must be specified with regard to the time and place of the offense. Finally, the circumstances surrounding the offense should be detailed and proven to fulfill the legal requisites for the specified crime classification. The investigative work carried out by the police authority serves to provide the prosecutor with all the above information.

Whether or not the prosecutor is able to bring in an indictment against a suspect, considering the above requirements, is entirely dependent on the result of the police investigation. In other words, a great contribution to the final outcome of a legal case is made already in the preliminary criminal investigation (Bring et al., 1999).

Most research on criminal investigation has been conducted from a criminological perspective (e.g., Burrows & Tarling 1987; Ericson, 1981; Greenwood et al., 1977; Innes, 2002, 2003). Spurred by an increased public concern over the effectiveness of the law enforcement system, this line of research has had the express purpose of providing an accurate account of actual police practice. As a consequence, the data presented are typically of a descriptive character. For instance, comparisons between different types of crime in terms of clear-up rates and typical investigative strategies are common (Burrows & Tarling, 1987; Greenwood et al., 1977). Although informative as to the overt nature of policing, previous research has said little about the psychological processes underlying the behavior of criminal investigators. Since the latter is the focus of the present research, it is beyond the scope of this thesis to provide a full review of the criminal investigation literature (for comprehensive descriptions of the investigation process, see Burrows & Tarling, 1987; Ericson, 1981, Greenwood et al., 1977; Innes, 2003). Instead, I will restrict the following treatment to the psychological literature on the issue.

Hypothesis Testing and Story Construction

Criminal investigation has been likened to a hypothesis-testing process (Wagenaar, van Koppen, & Crombag, 1993). According to this view, one or more tentative hypotheses are formed on the basis of the initially available information concerning a crime. Such hypotheses include assumptions about likely perpetrators, modes of conduct, and motives behind the offense. In subsequent stages, the tenability of the hypotheses is tried against new evidence gathered through various investigative methods (e.g., witness interviews, crime scene analyses). Optimally, this hypothesis-testing sequence should result in the verification of a hypothesis that represents the truth, and the rejection of all false hypotheses.

However, the notion that criminal investigation is guided by a search for the objective truth has been challenged. For instance, Innes (2002) argued that the truth in the minds of criminal investigators is “not an ‘absolute’ truth, but one that ‘suffices’ and is ‘good enough’, given the complexities of the social world” (p. 685). He found that investigators construct an internal representation of what is likely to have happened by structuring criminal evidence in a narrative format. That is, known facts regarding a crime are combined so that they tell a coherent story. In order to create a coherent whole, however, inferences must sometimes be made to fill gaps where there is no substantive evidence. In addition, some

aspects of a crime need to be excluded from the story if they do not fit into the investigators' view of what has happened. From this conception it follows that the search for "truth" is a reconstructive process with certain latitude for subjective interpretations and inferences. A similar view of criminal investigation was offered by Wagenaar et al. (1993). They argued that the entire judicial process, from the detection of a crime to the court's verdict, is characterized by story construction elements. A narrative representation of the likely course of events is often created early in the investigation of a crime. The purpose of subsequent investigative actions is to corroborate the story by showing that critical passages are supported by substantive evidence. Roughly speaking, the success of a case in court depends on whether the story proposed by the prosecution has received enough corroboration so that judges and jurors are convinced of its veracity.

It should be noted that the conception of the criminal justice procedure as a story-building process is not unique to the above researchers. The role of narratives in legal settings has been acknowledged previously in the context of judges' and jurors' decision-making (Bennett & Feldman, 1981; Pennington & Hastie, 1986, 1988, 1992). The converging evidence provided by research from the investigative and the judicial fields suggests that the reconstructive nature of evidence representation is a universal phenomenon deeply rooted in the principles of human memory (Schank & Abelson, 1995). Bearing this in mind, it appears as if criminal investigation is not merely a process of uncovering the truth, but rather an attempt to *reconstruct* the past. The subjective nature of such reconstruction brings psychological knowledge to bear on the study of investigations.

Investigative Psychology

Only recently has "investigative psychology" emerged as an independent field of research. As defined by Canter (2000a), the domain "covers all aspects of psychology that are relevant to the conduct of criminal or civil investigations" and "is concerned with psychological input to the full range of issues that relate to the management, investigation and prosecution of crime" (p. 1091). From this broad definition it is clear that a vast range of psychological knowledge becomes relevant to the field. Canter identified three processes that are always present in investigations and that can be improved by psychological study: information retrieval, inference drawing, and decision-making.

Information retrieval constitutes the major part of an investigation. This process aims at collecting as much detailed and accurate information as possible, which together can provide a coherent account of the crime. The single most aggravating issue, present in virtually every criminal investigation, is the scarcity of relevant information. Only rarely do clues come from physical evidence available for direct observation. Instead, investigators must typically rely on

second-hand sources of information, the most common of which is witness statements. A great portion of the psychological literature on the information retrieval process is therefore concerned with how the accuracy and detail of witness accounts can be maximized (Fisher & Geiselman, 1992; Milne & Bull, 1999). Another prominent line of research is the development of methods to assess the reliability of witness information (Granhag & Strömwall, 2004; Yuille, 1989). Because of the predominant focus on witness issues in previous research, the fallibility of investigations has often been attributed to the unreliability of witness information and to inadequate methods of obtaining such information (Wells et al., 2000). Apart from witnesses, other potential sources of information include traces left at the crime scene, records of transactions, expert reports, and suspects (Robertson & Vignaux, 1995).

Inference drawing, as defined by Canter (2000a), refers to the process whereby knowledge about different aspects of a crime is used to predict the likely characteristics of the offender(s). Research on the inference-drawing phase is found within the field known as “offender profiling” (Ainsworth, 2001; Alison, Bennell, Mokros, & Ormerod, 2002; Canter, 2000b; Godwin, 2000; Rossmo, 2000). The idea that offender characteristics can be predicted from crime scene actions rests on two basic assumptions (Alison et al., 2002). First, it is expected that offenders display behavioral *consistency*. That is, across a number of offenses, some aspects of an offender’s actions will remain constant. Second, there is an assumption of *homology* of offense behavior and offender characteristics. Specifically, the way an offense is carried out is expected to reflect some particular configuration of person characteristics. Whereas most offender-profiling research has focused on the relationships between offender characteristics and the nature of committed offences, only a few studies have examined the actual usefulness of profiles developed on the above premises (see Alison, Smith, & Morgan, 2003). Results from these latter studies however suggest that profiles only rarely aid investigators to identify suspects. Nevertheless, other results show that offender profiles are often perceived as helpful (Copson, 1995), because they may reassure investigators’ own judgments of the offender. The apparent discrepancy of the findings suggests that investigators may misjudge the accuracy of offender profiles, and the psychological bases of these judgments should therefore be an important focus for further research (for a recent example, see Alison et al., 2003).

Investigative *decision-making* refers to the task of deciding on the appropriate line of actions in the endeavor to solve a crime. Potential actions include those serving to increase the knowledge about the crime (e.g., inquiring into new sources of information), as well as more strategic measures (e.g., arresting suspects, restricting public access to vital information). The psychological study of general decision-making processes constitutes a vast research domain in itself (see Connolly, Arkes, & Hammond, 2000; Goldstein & Hogarth, 1997). The principles and models derived within this field should arguably be of high

relevance to the work carried out by criminal investigators. However, to date, most applications in psychology and law have concerned decisions made in a trial setting; that is, the evidence evaluation and verdict decisions made by judges and jurors (see Wrightsman, 1999). In contrast, the decision-making of criminal investigators has received surprisingly little attention (Canter, 2000a), and the few studies that exist focus on the causes and consequences of decisions rather than the decision process itself (Crego & Alison, 2004). Since investigative decisions have such profound consequences for the outcome of a case, it is imperative that future research takes a closer look at their psychological underpinnings. The present thesis, seeking to study the role of motivation, emotion, and hindsight bias in investigative judgments and decisions, falls within this category of research.¹

External Pressures in Investigative Work

An observation that frequently recurs in descriptions of the criminal investigation process is the fact that many investigations are carried out under substantial pressure (Greenwood et al., 1977; Innes, 2002; Nicol, Innes, Gee, & Feist, 2004). Despite this, no systematic examination has been conducted to find out its actual consequences for the quality of investigations. There is however theoretical reasons to assume that external pressures significantly affects investigators' processing of and search for evidence. Four factors in investigators' work environment merit particular consideration.

First, police work is typically carried out under time pressure (Innes, 2002; Nicol et al., 2004; Greenwood et al., 1977). A great number of cases must often be handled simultaneously, which leaves little time to be spent on investigating any single case. In addition, many strategic decisions such as whether or not to retain a suspect in custody must be made within restricted periods of time. Furthermore, awareness of the fact that the likelihood of a crime being solved decreases rapidly in the course of the first few days forces investigators to seek an early breakthrough in an investigation. Second, the police authority is characterized by a specific occupational culture (Granér, 2004; Reiner, 2000) with social norms that place a premium on decisiveness and effectiveness (Mortimer & Shepherd, 1999). From what is known about cultural influence on values and goals (Hofstede, 2001), these norms would be expected to affect the work carried out by individual investigators. Third, many crucial decisions make investigators commit themselves to a particular hypothesis or line of action. To avoid a loss of prestige, investigators may feel pressured to maintain their initial standpoint when facing subsequent information (Knutsson, 2004; Smith &

¹ This classification rests on Canter's (2000a) definition of the sub-fields of investigative psychology. It could be argued that many of the judgments to be studied here are better characterized as "inference drawing", but Canter reserves this category exclusively for offender profiling.

Flanagan, 2000). Thus, there is sometimes a pressure towards *belief perseverance* in criminal investigations. Finally, criminal investigations occasionally become the focus of the public's and media's attention. In response to particularly violent and consequential crimes, people demand that the perpetrators are promptly captured and brought to justice, and the failure to do so may trigger severe criticism (Bayley, 1994; Greenwood et al., 1977). Hence, there is sometimes strong external pressure on investigators to "get results" as quickly as possible.

Each of the above factors is likely to exert an influence on investigators' motivation towards the tasks that make up a criminal investigation. The resulting motivation may, in turn, reduce the quality of investigations by making them vulnerable to cognitive biases. It is therefore of great importance to examine the role of motivation in investigative work. The next section reviews previous research that has studied the impact of motivation on human cognitive processes.

MOTIVATED COGNITION

There is a long tradition in social psychology of studying biases and shortcomings of the human perceiver, and abundant empirical evidence supports the notion that people frequently rely on imperfect strategies when making social judgments (e.g., Nisbett & Ross, 1980). The predominant approach has been to study these biases from a purely cognitive perspective (e.g., Gilovich, Griffin, & Kahneman, 2002; Tversky & Kahneman, 1974). That is, researchers have studied systematic judgmental errors in terms of how information is retrieved, encoded, organized, and processed. Consequently, imperfections of human information processing have typically been viewed as consequences of the dispassionate workings of the cognitive system. The motivated social cognition (MSC) literature, in contrast, represents a recent development in the field that emphasizes motivation as an additional cause of biases (Kruglanski, 1996a; Kunda, 1990; Pyszczynski & Greenberg, 1987). There is now ample evidence that motivation provides explanatory power for a range of social psychological phenomena, over and above that which can be accounted for by purely cognitive accounts (for a review, see Kruglanski, 1996a). It is clear, however, that the MSC framework adopts a lot of its analytical terminology and use of concepts from the cognitively tinged judgment and decision-making literature. Its focus on reasoning processes is, in fact, what sets it apart from earlier approaches to the influence of motivation, such as the "New Look" of the mid-19th century. The works of researchers representing the latter school (e.g., Bruner, 1957; Bruner & Goodman, 1947; Postman, Bruner, & McGinnies, 1948) were primarily concerned with perceptual processes, and not so much with the elaboration and integration of abstract information.

The central issue in MSC research is how people's wishes and desires regarding the outcome of reasoning processes affect judgments and decisions

(Kunda, 1990). Because motivation, as the term is used within the MSC framework, refers to preferences for particular kinds of knowledge and conclusions, the type of goals studied in this approach has been labeled “epistemic goals” (Kruglanski, 1989). This definition marks the difference from other types of desires, such as those stemming from biological needs, for which the generic term “motivation” is also commonly used. A taxonomy of epistemic goals can be discerned by distinguishing between three types of motives: accuracy goals, closure goals, and directional goals (Kunda, 1999).

Accuracy Goals

As the name implies, accuracy goals represent a motivation to arrive at the most accurate conclusion possible concerning some judgmental issue. Accuracy goals are activated under conditions of accountability; that is, when a person will be held personally responsible for the consequences of his or her judgment or decision (Lerner & Tetlock, 1999; Sedikides, Herbst, Hardin, & Dardis, 2002; Tetlock, 1992). In addition, people are motivated to be accurate when the outcome of an important task depends to a large extent on their judgment (Neuberg & Fiske, 1987; Stapel, Koomen, & Zeelenberg, 1998; Thompson, Roman, Moskowitz, Chaiken, & Bargh, 1994). The consequences of accuracy goals for human cognition can be appreciated in terms of a dual-process framework (e.g., Chaiken & Trope, 1999). In the absence of personal involvement in a judgmental issue, people often rely on superficial, heuristic processing. Thus, people fall back on simplified judgment strategies that typically produce fairly good approximations (Gigerenzer, Todd, & the ABC Research Group, 1999). In contrast, when accuracy goals are activated, people engage in more systematic, elaborate thinking and analysis of the available information (Chaiken, Giner-Sorolla, & Chen, 1996; Chen, Duckworth, & Chaiken, 1999). In short, accuracy goals affect the effort invested in a judgment task. Increased effort typically leads to more accurate judgments, as evidenced by a number of social cognition studies. For instance, several cognitive biases (e.g., primacy effects, anchoring effects) have been shown to decrease considerably when people are motivated to make accurate judgments (Kruglanski & Freund, 1983; Tetlock, 1992).²

Criminal investigation work would undoubtedly benefit from the thoroughness that typically results from accuracy goals. For instance, increased effort in the investigation of a single crime would yield a larger base of relevant information. This, in turn, provides for better informed and more reliable

² Improved accuracy is the typical result of increased accuracy motivation. However, when an accuracy-motivated individual does not have a better judgment strategy in his or her cognitive repertoire than that which is normally employed, increased effort will not result in more accurate judgments (Kahneman & Tversky, 1973). In rare instances, accuracy goals may even make people resort to inferior strategies, producing less accurate judgments (e.g., Wilson & Schooler, 1991).

prosecution and verdict decisions. However, as pointed out previously, investigators face a number of conflicting demands in their work, many of which are likely to compete with the motivation to treat each case as accurately as possible. Hence, there is reason to assume that many investigations are conducted under the influence of other epistemic goals.

Closure Goals

Sometimes ambiguity and uncertainty concerning a judgmental topic is perceived as frustrating and unpleasant. Under such circumstances, people are motivated to arrive at a definite conclusion; to reach cognitive closure (Kruglanski, 1989, 1990, 1996b, 2004; Kruglanski & Webster, 1996). An individual's need for closure (NFC) is heightened whenever indecisiveness is perceived as costly. For instance, such conditions arise when people are occupied with a boring or unattractive task (Mayseless & Kruglanski, 1987; Webster, 1993), under time pressure (Kruglanski & Freund, 1983), in the presence of environmental distraction (e.g., Kruglanski & Webster, 1991; Kruglanski, Webster, & Klem, 1993), and when mentally fatigued (Webster Nelson, Klein, & Irvin, 2003; Webster, Richter, & Kruglanski, 1996). The need for closure also varies across individuals as a stable personality dimension (Kruglanski, 1989; Webster & Kruglanski, 1994). Thus, people differ consistently in the disposition to apprehend the world in clear-cut, unambiguous terms. According to Kruglanski (1996b), a person with a strong need for closure will “leap’ to judgment on the basis of inconclusive evidence, and exhibit rigidity of thought and reluctance to consider views other than his or her own” (p. 468). Thus, the consequences of NFC on human cognition are substantial. When motivated to achieve closure, people tend to “freeze” their thinking once having come across a tentative solution, being reluctant to consider other alternatives. In addition, people “seize” readily accessible information as a basis for their judgments, rather than searching for the most diagnostic evidence (Kruglanski & Webster, 1996). A high need for closure, whether dispositionally or situationally caused, has manifested itself in previous research as a heightened tendency to display primacy effects (i.e., basing impressions predominantly on information received early; e.g., Webster et al., 1996), to commit the fundamental attribution error (i.e., failure to account for situational factors in attributions of behavior; e.g., Webster, 1993), to reject group members with deviant opinions (Kruglanski & Webster, 1991), to apply stereotypes (Kruglanski & Freund, 1983), and to resist persuasion in the presence of a prior opinion (Kruglanski et al., 1993).

One can assume that investigative work is often carried out under a need for closure because of the conditions that characterize criminal investigators' work environment. Specifically, time pressure, norms promoting decisiveness, and prestige concerns are likely to activate closure goals in relation to police officers' work. Kruglanski and Webster (1996) indeed acknowledged the potential of

closure motives to spread within cultural or social institutions, claiming that differences in the need for closure “may spring from various sources, such as cultural norms ... or personal socialization histories that place a premium on confidence and ‘know-how’” (p. 265). Some predicted effects of NFC in investigative settings will be addressed later, in the context of directional goals.

Directional Goals

When people have personal interest vested in an issue they are often motivated to arrive at the particular conclusion that their own belief, attitude, or perspective is superior to other alternatives; that is, they strive towards a *directional goal* (Kunda, 1990). Examples of such motives are abundant in everyday life. For instance, advocates of competing political ideologies are motivated to find that their own particular standpoint is superior to others (De Dreu & Carnevale, 2003; Jost, Glaser, Kruglanski, & Sulloway, 2003). Romantic partners tend to view with leniency the imperfections of their partner, and to accentuate his or her virtues compared to others (Murray, 1999). Furthermore, people in general wish to see that their own particular background and attributes are conducive of future success and happiness (Kunda, 1987).

At first glance, the definition of directional goals may seem markedly different from closure goals. In reality, however, the two are often closely related, since closure goals may transform into directional goals (Kruglanski et al., 1993). As a forensic example, consider an investigator burdened with a heavy caseload and with a limited amount of time to be spent on each single case. The most effective way to cope with this pressure would be to clear up each case as quickly as possible. Consequently, the investigator approaches the cases with a need for closure. Consider further that, for one of the cases, a plausible hypothesis as to the likely perpetrator presents itself on first inspection of the case material. Because of the NFC-induced inclination to “seize” accessible information, it would be expected that the investigator readily adopts this obvious explanation as his working hypothesis. Further, as a consequence of the tendency to “freeze” on first impressions, the investigator would be motivated to see the adopted hypothesis confirmed by subsequent evidence. Thus, a nonspecific closure goal is transformed into a specific directional goal. Support for such a transformation process was presented by Kruglanski et al. (1993), who showed that participants high (vs. low) in NFC were more receptive to persuasion in the absence of a prior opinion, but less so once having “seized” an opinion on an issue. Thus, in the latter condition, high-NFC participants were motivated by the directional goal of perpetuating their prior belief.

In many investigations, a directional goal may be established right at the outset. For instance, research indicates that police officers often treat suspects in ways that reflect a strong conviction that the suspect is in fact guilty (Baldwin, 1993; Bayley, 1994; Gudjonsson, 2003; Leo, 1996). Starting an investigation with

such strong presumptions of guilt may pose a serious threat to objectivity. Specifically, when working under time pressure or other NFC-inducing circumstances, investigators may become motivated to confirm the guilt of a suspect, because it constitutes the most readily accessible hypothesis. Of course, the transformation of closure goals is not the only possible source of directional goals in police work; preferences as to the outcome of an investigation may exist for reasons other than external pressures. For instance, an investigator may feel a strong desire to put a particular suspect away because of his previous criminal history or because he is deemed capable of committing more serious offences. Such idiosyncratic directional goals should however be less common than those arising in response to investigators' shared occupational environment, because the latter are not specific to the personal preferences of individual investigators. Whatever its source, the quest for attainment of a directional goal may set a number of psychological mechanisms in motion, which will be treated next.

Mechanisms of Motivated Cognition

Directional goals can substantially color judgments and decisions. When motivated to find support for a preferred conclusion, people may attain that goal in a number of ways, relying on different psychological mechanisms. Four of these—quantity of processing, inferential strategies, biased memory search, and theory construction—will be described in this section. In addition, predictions as to how each mechanism might affect investigative work will be detailed.

Quantity of Processing

All judgments and decisions are made on the basis of some information with perceived relevance to the issue at hand. The interpretation of available information is therefore a crucial determinant of the conclusions reached. Recent research has shown that people treat information with positive and negative implications for a favored conclusion quite differently. Much of this research was done by Ditto and colleagues who advocate a *quantity-of-processing* view of motivated cognition (Ditto & Boardman, 1995; Ditto & Lopez, 1992; Ditto, Munro, Apanovitch, Scepanisky, & Lockhart, 2003; Ditto, Scepanisky, Munro, Apanovitch, & Lockhart, 1998). This approach holds that evidence inconsistent with a desired belief is subjected to more cognitive analysis and scrutiny than consistent evidence. In other words, people meet information they do not want to believe with greater skepticism and more attempts at refutation, compared with information they do want to believe. It is easy to appreciate the functional value of such a mechanism: When motivated to arrive at a particular conclusion, detailed scrutiny of supportive information obstructs the intended goal, whereas uncritical approval expedites goal fulfillment. In contrast, information that runs contrary to the desired belief imposes a threat to the perceiver's goal state. In order to alleviate that threat, the validity of the information can be undermined

by targeting weaknesses pertaining to the source of the information. As a consequence, non-threatening interpretations of the information can be generated. These strategies for coping with preference-inconsistent information require considerable cognitive effort—hence the term quantity of processing.

Asymmetrical skepticism towards preferred and nonpreferred information is widely documented in the social cognition literature, and has been demonstrated in response to information regarding people's physical health (Ditto & Lopez, 1992; Ditto et al., 2003), beliefs and attitudes (Edwards & Smith, 1996; Lord, Ross, & Lepper, 1979), and significant others (Klein & Kunda, 1992; Stevens & Fiske, 2000). Of particular interest to the research presented in this thesis, it has been shown that a heightened NFC strengthens the tendency of asymmetrical skepticism. In a series of experiments, Kruglanski and Webster (1991) found that participants working on a choice task were more skeptical and negative towards persons who expressed opinions that opposed their favored alternative when the decision task was carried out under high (vs. low) NFC.

Although compelling evidence comes from traditional social-cognitive research, no attempts at studying the operation of motivationally caused differences in skepticism exist within the forensic arena. However, the principles underlying the asymmetrical-skepticism effect can easily be transferred to an investigative context. Given that an investigator has adopted a belief concerning a particular case and is motivated to see that position confirmed, the information obtained during an investigation can be categorized as either preference-consistent or preference-inconsistent evidence. For instance, a witness statement may convey information that either confirms or disconfirms the presumptions of the police. Consequently, the investigator will be motivated to either believe or disbelieve the reported information. From a quantity-of-processing standpoint, it would be predicted that more cognitive effort will be invested in evaluating the preference-inconsistent statement, compared with the preference-consistent statement. In extreme cases, the former may be profoundly scrutinized, whereas the latter may be taken at face value. When motivated to come up with reasons to disbelieve a witness, such grounds can easily be constructed. Referring to questionable witnessing conditions, potential motives to lie, and an untrustworthy personality are but a few examples. In addition, some cues that police officers use to assess the veracity of witness reports are subjective, and hence present certain latitude for interpretation (Strömwall & Granhag, 2003; Wells et al., 2000). Thus, the perception of statement characteristics such as richness of details or consistency may be biased to suit the preferred conclusions of the investigator. Previous research on deception detection indeed shows that subjective ratings of several behavioral characteristics are malleable as criteria for veracity judgments (Granhag & Strömwall, 2000a, b).

Of course, other types of evidence besides witness statements may be subjected to asymmetrical skepticism. However, the extent to which the perception of evidence may be biased by motivation is likely to be determined by

the latitude for interpretation, or *elasticity* (Hsee, 1995, 1996), that the specific type of evidence affords. For instance, witness statements may be particularly vulnerable to motivational biases because of the many factors known to deteriorate the reliability of memory reports (Cutler & Penrod, 1995; Sporer, Malpass, & Köhnken, 1996). Thus, there are many conceivable ways to justify the derogation of a witness statement. In contrast, investigators' evaluation of physical evidence, such as DNA analyses, may be less susceptible to bias because of its documented high reliability (Robertson & Vignaux, 1995). Hence, it would often appear irrational to question the validity of such evidence. Research has shown that motivation can influence judgments and decisions only to the extent that the individual can maintain an *illusion of objectivity* (Kunda, 1990; Pyszczynski & Greenberg, 1987). People are thus motivated to uphold a view of themselves as rational human beings. In light of this, the derogation of types of evidence known to be generally reliable may be prevented because it would be perceived as a blatant violation of rationality.

Inferential Strategies

A second mechanism that allows people to arrive at desired conclusions is a selective reliance on strategies for information search and for drawing inferences from available evidence. This issue can be viewed from a hypothesis-testing perspective, thus regarding judgments as the product of testing tentative propositions against information at hand (e.g., Pyszczynski & Greenberg, 1987). According to this view, a desired conclusion may be attained by proving a favorable hypothesis to be tenable. It is argued that an individual's directional goals may affect the entire hypothesis-testing sequence, including the generation of the hypothesis to be tested, the selection of inference rules used to evaluate the hypothesis, the search for relevant information, the evaluation of the retrieved information, and the final evaluation of the tested hypothesis.

In the presence of relevant information, the algorithms and inference rules used to make sense of the information may differ considerably depending on people's motivation. To date, this issue has been studied predominantly with regard to how people make sense of statistical data in settings such as financial decision-making (Boiney, Kennedy, & Nye, 1997; Louie, 1999), stereotyping (Doosje, Spears, & Koomen, 1995; Schaller, 1992), logical problem solving (Dawson, Gilovich, & Regan, 2002), and behavioral prediction (Epley & Dunning, 2000). In short, this body of research shows that people rely on more complex inferential strategies when the statistical material has negative implications for people's directional goals, and engage in more simplified, heuristic reasoning when the material is beneficial to the individual or lacks motivational relevance. This response pattern is likely to arise because superficial strategies are sufficient to draw preferred conclusions from seemingly positive information, whereas more in-depth processing is required to derive something favorable from ostensibly negative information.

The *confirmation bias* is a well-documented phenomenon that seems to play a role in practically every domain of human cognition (e.g., Evans, 1989; Klayman & Ha, 1987; Nickerson, 1998). In short, people tend to seek and interpret information in ways that are partial towards existing beliefs. Conversely, they tend to avoid information that would contradict those beliefs and support alternative possibilities (Koriat, Lichtenstein, & Fischhoff, 1980). This results in a mustering of evidence supporting one's position and a bolstering of confidence in that belief, often at the expense of objectivity. Previous research has shown that the tendency to treat evidence in this biased manner increases when one is motivated to maintain an already existing belief (for a review, see Nickerson, 1998). Thus, when people are personally involved in a position, they tend to process information in an even more partial manner.

The above findings present two theoretical predictions for legal psychologists to test, the first of which concerns information search strategies. In short, it would be expected that, when motivated to find support for an adopted hypothesis, the tendency of investigators to seek evidence in a partial manner will increase. In investigative settings, the proposition that a particular suspect is guilty often constitutes the hypothesis to be tested. The way criminal investigators retrieve evidence used to evaluate that hypothesis is likely to be influenced by motivation. It would thus be predicted that one effect of directional goals will be that investigative actions become more focused on finding incriminating (i.e., confirming) evidence against a prime suspect, while less effort is made to find potentially exonerating (i.e., disconfirming) information. Such selective information search clearly reduces the objectivity of an investigation.

The second notion implied by the confirmation bias—biased interpretation of evidence—also has implications for criminal investigations. Broadly speaking, it is predicted that a directional goal regarding the outcome of an investigation will serve to make investigators more inclined to take non-diagnostic pieces of information to support their working hypothesis; that is, they may fail to realize that the very same information might be equally or more consistent with alternative hypotheses. Worse still, even in the face of objectively disconfirming evidence, investigators may fail to abandon a false hypothesis. Needless to say, police officers' biased interpretation of evidence and reluctance to abandon or reevaluate adopted hypotheses may reduce the efficiency of an investigation. More seriously though, unnecessary suffering may be imposed on innocent suspects. When the working hypothesis is a presumption of guilt, ambiguous and potentially exonerating information may rather be interpreted in incriminating terms. Thus, for instance, if investigators interpret what actually is exonerating evidence as support for a "guilty" hypothesis, the release of an arrested innocent may be delayed. In addition, innocent suspects risk being treated with a great deal of coercion during interrogation when investigators have an unfounded presumption of guilt (Kassin, Goldstein, & Savitsky, 2003).

Biased Memory Search

The above mechanisms deal with how people search, react to, and draw inferences from information in the external environment. However, an important basis for people's decisions is information retrieved from their own memory. Directional goals can affect which specific information is accessed from memory at a particular point in time. This is, according to Kunda (1990), because people engage in a biased memory search in order to muster up the evidence necessary to support a desired conclusion. Given the complexity and richness of human memory, it is often possible to retrieve instances that support just about any desired belief. The result of such selective memory search is that people generate a highly partial body of evidence, but believe themselves to have rational grounds for drawing the preferred conclusion. There is now evidence that memories differ in accessibility due to both individuals' attitudes (Ross, McFarland, & Fletcher, 1981) and self-esteem concerns (Klein & Kunda, 1993; Sanitioso, Kunda, & Fong, 1990). Motivation has been found not only to bias the retrieval of memories, but to also cause a reconstruction of information stored in long-term memory. A number of studies have shown that the motivation to view oneself (Klein, 2001) or a likable other (McDonald & Hirt, 1997) in a positive light leads people to bias the recollection of past performances in a favorable direction. Thus, it appears as if directional goals may have the powerful potential to create false memories; an issue with forensic implications that merits further research in its own right.

A selective reliance on memories as a basis for decisions and judgments may cause unwanted effects in a criminal investigation. Just as any other professional group, police officers make use of their prior experience when facing new situations (Smith & Flanagan, 2000). Courses of action may be chosen because they have proven effective in previous cases. In addition, working hypotheses may be set up by means of analogy. The details regarding a crime may be reminiscent of a case that the investigator has worked on previously. Inferences made during the investigation of the older case may therefore be imported into the ongoing investigation. Thus, investigators' memory presents an information base in supplement to the evidence obtained through investigative actions. Compared with material evidence, however, memories afford greater elasticity (Hsee, 1995, 1996) and the retrieval of memories allows for considerably more selectivity. It is possible to (wittingly or unwittingly) recall only instances that support the tentative conclusion under consideration. Conversely, memories that contradict the favored hypothesis can be neglected. The concrete prediction that follows is that when investigators work with a specific hypothesis in mind and are motivated to persist in that belief, the accessibility from memory of instances with an outcome similar to that hypothesized will increase relative to instances with incongruent outcomes. In sum, reliance on prior experience is a useful tool when employed in an impartial manner, but may seriously bias investigations if used selectively to serve the purpose of a directional goal.

A second way in which motivationally caused differences in memory accessibility may affect investigative work concerns the process by which investigators create an internal representation of a case. As described in a previous section, information regarding a crime is used in a constructive fashion to assemble a narrative representation of what is likely to have happened (Innes, 2002; Wagenaar et al., 1993). Such story building often entail subjective inferences to be drawn in order to fill critical knowledge gaps. In addition, certain details that do not fit into the constructed narrative may be excluded. Because of the vast amount of information that accumulates during an investigation, all information cannot be handled simultaneously. Instead, officers must rely to a certain extent on their memory for the most relevant facts (Greenwood et al., 1977). Since information consistent with a preferred hypothesis is likely to be rendered more accessible from memory than inconsistent information, it is predicted that the narrative representation of a crime will be based more selectively on hypothesis-consistent information for investigators motivated by a directional goal, compared with investigators who are neutral with regard to the hypothesis. Evidence that memory accessibility is related to narrative construction comes from research on juror decision-making. In a number of studies, Pennington and Hastie (1986, 1988, 1992) showed that jurors represent legal evidence in a story format, corresponding to the course of events implied by the evidence. It was found that jurors who selected different verdicts also had constructed different stories to explain the evidence. Interestingly, when jurors were asked to give spontaneous comments concerning the case throughout the verdict decision process, elements that fit into the constructed story were frequently mentioned whereas those that did not fit were generally excluded (Pennington & Hastie, 1986). Furthermore, in a recognition test, jurors were more likely to remember elements that fit the story they had constructed, compared with elements that did not fit the story (Pennington & Hastie, 1988). These findings suggest that information consistent with a hypothesis under consideration is more likely than inconsistent information to be retrieved from memory.

Theory Construction

Although less extensively researched than the above mechanisms, a few studies indicate that people's desire to find support for a particular conclusion may cause them to construct ad-hoc causal theories in defense of their position (Dunning, Leuenberger, & Sherman, 1995; Kunda, 1987). For instance, people who value success in a particular domain may come to believe that their own characteristics are especially conducive to success. A study of Kunda (1987) presents a simple demonstration of this phenomenon. Kunda had participants indicate how they thought their own personal attributes and background would relate to the likelihood of future success at school or to the chances of achieving a happy marriage. Interestingly, people with opposite attributes generated opposite

theories as to the influence of those attributes. For example, those whose mother had been employed outside the home during their childhood believed this to be conducive to marital happiness, whereas those whose mother had stayed home with the children believed this to be predictive of the very same outcome. In essence, the ad-hoc construction of causal theories allows people to make the same favorable predictions and explanations from very different, or even opposing, sets of information.

If the above principle applies also to criminal investigators' reasoning about evidence, causal theories might be constructed in the same manner to justify a preferred hypothesis in an investigation. For instance, causal explanations of anomalies might be constructed to rationalize why ostensible inconsistencies should not prompt the abandonment of a selected line of inquiry. A particularly illustrative example of this phenomenon comes from one of the most debated cases in Swedish criminal history—the *Catrine da Costa* murder (Holgerson & Hellbom, 1997; Lindeberg, 1999; Sjöberg, 2003). In this investigation, two physicians were suspected of having murdered a prostitute and dismembered her body. The police believed that one of the suspects' three-year old daughter might have witnessed the crime, and she was taken to the location where the murder had supposedly taken place. It was expected that the daughter would display signs of emotional distress, which would be taken to support the police's presumption that she indeed had witnessed the murder at the location. Contrary to expectations, no signs of distress were observed. However, rather than concluding that the child may not have formed any traumatic memories on the location, it was argued that the lack of reactions was a sign of "forced indifference," which was said to be a defense mechanism to repress the alleged distressing memories. Hence, a new causal theory, diametrically opposed to the one the investigators originally set out to test, was created to account for the seemingly inconsistent evidence. This, in turn, justified retaining the hypothesis that the child had witnessed the murder. In line with the above example and previous research (Dunning et al., 1995; Kunda, 1987), it is predicted that investigators with a motivation to confirm a particular hypothesis, if necessary, will construct congruent causal explanations of the evidence at hand. One conceivable consequence is therefore that investigators endorsing opposing hypotheses will, when possible, construct opposing theories to explain the very same observation.

EMOTION AND COGNITION

The area of social psychology sometimes referred to as "hot cognition" (Kunda, 1999) includes, in addition to the research on motivated cognition, research on the relation between emotion and cognition. The predominant views of motivational and emotional influences on cognition share two central features: First, the motivational and emotional systems are assumed to be at least partly

distinct from the cognitive system. Hence, the effects of motivational and emotional forces are treated as a result of factors external to the cognitive system being infused into the information processing sequence. Second, the precise consequences of motivation and emotion for judgments and behavior are considered to be mediated by cognitive mechanisms. Thus, goals and feelings exert their influence by instigating different processing strategies, attribution tendencies, and other mechanisms of a cognitive nature. In sum, there are great similarities in the approaches to studying motivation and emotion, and it is hence feasible to treat the effects of both on criminal investigation in similar terms. In the following sections, I will first briefly review the major findings in research on emotion and cognition. Second, I will move to recent developments that focus on specific effects of distinct emotions, before outlining their consequences for investigative psychology.

Valence-Based Approaches

The influence of emotion on cognition has been studied systematically for more than three decades. Although feelings had previously been considered a component of attitudes and motives, it was not until the early 1970's that researchers began to manipulate emotions experimentally and observe their direct consequences for social judgments (e.g., Gouaux, 1971; Griffit & Veitch, 1971). As results accumulated, two consistent lines of findings began to emerge. One was the demonstration of mood-congruent memory, showing that the accessibility of different information from memory is dependent on the match between its emotional valence and the individual's current emotional state (Bower, Monteiro, & Gilligan, 1978). For instance, it was found that sad people more easily came to think of sad memories than happy memories (Bower, 1981). The second major finding was the existence of mood-congruent judgment, showing that the evaluation of a target is often colored by the perceiver's mood state (Isen, Shalker, Clark, & Karp, 1978). For example, people in a happy mood were found to make more positive ratings of their general life satisfaction than people in a sad mood (Schwarz & Clore, 1983). From these observations sprung the idea that the valence of mood states is the organizing principle that determines the effects of emotions on cognition. Theories building on this principle can thus be termed valence-based approaches.

Outcome Effects

Early studies on the relation between emotion and cognition demonstrated that feelings may affect the outcome of social judgments. As mentioned above, the nature of such influence is typically mood congruent, such that positive mood leads to more positive evaluations, and negative mood to more negative evaluations, compared with neutral mood. Two types of accounts have been put forward to explain these effects. Memory-based accounts hold that affective

feelings prime congruent beliefs about the target in memory, which in turn are used as a basis for the evaluation (Bower, 1981, 1991). Thus, according to this view, it is the relative salience of beliefs sharing the emotional state's valence that mediate mood-congruent judgments. In contrast, information accounts hold that affective states directly influence judgments by serving as a piece of evaluative information (Schwarz, 1990). An individual may be informed about her attitude towards an object simply by asking herself "how do I feel about it?". One's feelings may thus become integrated with other information with relevance to the object in the final evaluation. Consistent with the latter explanation, it has been demonstrated that the perceived informational value of one's affective state for the evaluation at hand is predictive of whether congruent judgments will result (Schwarz & Clore, 1983). If the informational value is somehow undermined, for instance by reminding the individual that her affective state stems from an experimental manipulation and not the object to be evaluated, mood-congruent judgments do not result. Hence, affective states may be used as a direct source to inform judgment, but only when it is perceived as relevant to the target.

Forgas (1995) developed the Affect Infusion Model (AIM), which posits that affective states may influence judgments through either the memory or the informational route depending on the circumstances. Under conditions where heuristic processing is likely, such as when the motivation to process or cognitive resources are limited, an individual is likely to use the "How-do-I-feel-about-it" strategy, and let its affective state serve as a direct source of information. However, when more systematic processing is likely, in the presence of both motivation and resources, affect is likely to exert its influence through mood-congruent priming. Because the accessibility of valenced beliefs is altered by an individual's affective state, congruent beliefs will have a greater impact than incongruent beliefs when different information is integrated to form the final judgment. Although the model is able to theoretically reconcile the memory-based and informational accounts of mood-congruent judgment, it is important to note that there is no conclusive evidence for AIM's predictions (Schwarz & Clore, 1996).

Processing Effects

Apart from displays of mood-congruent outcomes of judgments, researchers soon found that positive and negative affective states appeared to affect differently the *process* whereby judgments were reached. Specifically, positive affect seemed to lead to relatively heuristic processing, and negative affect seemed to lead to relatively systematic processing. This pattern was demonstrated by Bless, Mackie, and Schwarz (1992) in a study comparing the responsiveness to persuasive messages among participants in a positive or negative mood. While participants in a negative mood were more persuaded by strong than by weak arguments, participants in a positive mood were equally

persuaded by strong and weak arguments. This finding indicated that positive mood made participants less prone to systematically process the arguments, and hence less apt to discern the difference in quality between the arguments, compared with negative mood (for a review of the mood-and-persuasion literature, see Wegener & Petty, 1996).

Additional support for the idea that positive and negative affect promote different depth of processing comes from research on mood and stereotyping. Relying on stereotypes when making social judgments is a way to reduce cognitive effort, since it diminishes the need to pay close attention to the individual features of the target and to assemble them into a complete impression (Bodenhausen & Lichtenstein, 1987; Fiske & Neuberg, 1990). Quick judgments can be produced by instead falling back on preexisting categorizations based on group membership. Hence, the use of stereotypes should increase under conditions where the likelihood of systematic processing is reduced and heuristic processing is promoted (e.g., positive mood). In a series of experiments, Bodenhausen, Kramer, and Süsser (1994) had participants in a happy or neutral mood make judgments of the likely guilt of a fellow student who was accused of assault or cheating on a test. The identity of the suspect was manipulated so that for half the participants he was a member of a group stereotypically associated with the type of offence (Hispanic in the case of assault, and track-and-field athlete in the case of cheating), but not for the other half. Happy participants made higher guilt ratings of the stereotyped target than of the nonstereotyped target, suggesting that they relied on the stereotype as a basis for their judgment. Neutral participants, on the other hand, did not differ in their guilt ratings of the two targets, suggesting that they instead relied on the case-specific evidence. In a follow-up experiment, Bodenhausen et al. were able to demonstrate that spontaneous differences in processing intensity were responsible for the difference between the judgments of happy and neutral participants. Happy participants once again made more stereotypic judgments, but not if they expected to be held accountable for their judgments. When facing the possibility of having to assume responsibility, they invested more cognitive effort in the task and, hence, eliminated the influence of the stereotype.

Negative mood has the inverse relation to stereotype use. In one study, Edwards and Weary (1993) compared the impression-formation processes of depressed and nondepressed perceivers. They found that depressed participants used trait attributes when evaluating a person and made individuating judgments of the person, even when category information was provided that allowed for heuristic stereotyping. Nondepressed participants, in contrast, used the category information as the basis for their judgments when available. Presumably, the negative mood of depressed participants induced them to engage in a more systematic, piecemeal processing of the target information, which in turn counteracted the reliance on stereotypes (for reviews on affect and impression formation, see Bodenhausen, 1993; Schwarz & Clore, 1996).

Although differing somewhat in the specifics, most theories argue that the processing strategies associated with positive and negative affect serve a functional purpose. For instance, Schwarz (2001) assumes that an individual's affective state works as a signal as to the status of her environment. Roughly speaking, negative affect informs the individual that something is not right and needs to be taken care of. As a result, more cognitive effort is allocated to the focus of the individual's attention, which deepens the process through which judgments are made. Positive affect, on the other hand, indicates that there is nothing problematic about the environment and that there is no need for corrective actions. Consequently, relatively superficial processing suffices to deal with whatever task is at hand, and judgments are made in a heuristic manner. Other theorists have made slightly different interpretations of the relation between emotion and processing strategies (see Martin & Clore, 2001). However, all established theories assume that affect plays an informational role, which signals which type of processing is most adaptive in the current situation.

Cognitive-Appraisal Models

While earlier theories of emotion and cognition saw the valence of affective states as the central dimension, more recent theorists argue that other characteristics of emotions may be predictive of specific cognitive effects (Keltner, Ellsworth, & Edwards, 1993; Lerner & Keltner, 2000). Because valence is not the only relevant dimension according to these approaches, different effects can be expected among emotions sharing the same valence. Before going into details about the nature of emotion-specific influences, I will present a brief review of the idea's origin.

The idea that specific emotions, such as anger, fear, and sadness are experienced in distinctly different ways is probably as old as human thought. Since the birth of psychology as a scientific discipline, researchers have been interested in ways to classify emotions so that the unique components of different affective feelings can be identified (e.g., Wundt & Judd, 1897; Schlosberg, 1954). Despite continuous effort, the empirical results emerging from this tradition were for a long time disappointing. The only two dimensions that seemed to consistently describe emotions were pleasantness and arousal (for a review, see Smith & Ellsworth, 1985). However, it is intuitively obvious that these two dimensions cannot adequately distinguish between all variations of emotional experience. For instance, fear and anger are both unpleasant and evoke high arousal, yet one would rarely mistake one for the other when experienced subjectively.

Smith and Ellsworth (1985) saw the need to identify additional valid descriptors, and proposed a set of cognitive-appraisal dimensions that would allow different emotions to be separated. Cognitive appraisals are the thought content associated with the experience of an emotion. In an explorative study,

they let participants describe situations in which they had experienced each of 15 different emotions, and then asked them to rate their experience along the cognitive-appraisal dimensions. Six dimensions that were particularly apt to differentiate emotions were pleasantness, anticipated effort, certainty, attentional activity, self-other responsibility/control, and situational control. Each emotion had its unique position resulting from a combination of these dimensions, and the particular “appraisal pattern” for a specific emotion corresponded to the core meaning of the emotion. For instance, anger was characterized by strong unpleasantness, an emphasis on human control, attributions of responsibility to others, and relatively high certainty. Fear was also marked by strong unpleasantness, but was, in contrast, associated with high uncertainty and an emphasis on situational control.

The Appraisal-Tendency Framework

Drawing on the work of Smith and Ellsworth (1985) and other cognitive appraisal theories of emotion (e.g., Roseman, 1984; Scherer, 1988), Lerner and Keltner (2000, 2001) developed the *appraisal-tendency framework*. Their approach takes a functional view of emotions, holding that affective feelings serve an adaptive role in an individual’s interaction with its environment (Frijda, 1986; Levenson, 1994). Thus, it is assumed that emotions set in motion a number of responses that predispose the individual to effectively handle presented problems or opportunities. Apart from evoking physiological and behavioral responses, emotions have the potential to focus attention and cognitive resources on information relevant to the emotion-eliciting event (Schwarz, 1990). The resource-allocating consequences of emotions are in fact so powerful that they may transcend the initial situation and influence cognition in unrelated events. For example, Goldberg, Lerner, and Tetlock (1999) found that anger, evoked by letting participants read about a serious crime, carried over and increased blame attributions in subsequent unrelated situations.

The tendency of the cognitive components of emotions to influence interpretation and judgment in future situations was termed “appraisal tendencies” by Lerner and Keltner (2000, 2001). An appraisal tendency is thus the inclination to perceive future situations in terms of the cognitive dimensions central to the currently experienced emotion. The impact of appraisal tendencies has been documented in a number of studies, some of which will be reviewed next in the particular context of anger and sadness.

Cognitive Consequences of Anger and Sadness

In the present context, it is particularly interesting to contrast the cognitive consequences of anger and sadness. There are two compelling reasons for this special focus: First, in criminal cases, investigators are faced with the consequences of some negative event (e.g., murder, theft, accident). The negative

implications of such events are likely to evoke negative rather than positive feelings. Anger or sadness are especially likely to occur, depending on whether there is a focus on the person responsible for the event or on the victim of the event. Second, anger and sadness are particularly suited to compare from a methodological perspective, because their associated appraisal tendencies predict opposing effects in several regards (Lerner & Keltner, 2000). To reiterate, the experience of anger has been found to create a focus on human control as a source of negative events and a strong sense of certainty about what has happened and will happen in the future. Sadness, in contrast, is accompanied by a tendency to view situational factors as responsible for negative events and a sense of uncertainty about the situation and the future (Smith & Ellsworth, 1985). To examine the influence of these appraisals, one should study their effects on judgments along dimensions that correspond to the appraisal dimensions central to the specific emotions. In the case of anger and sadness, examples of cognitive variables especially likely to be affected are attribution processes and processing depth.

Attribution effects. Keltner et al. (1993) examined the differential influence of anger and sadness on causal judgments. Emotion was manipulated by letting participants read a hypothetical scenario constructed to evoke either anger or sadness. In a first experiment (Experiment 1), participants were then asked to estimate the probability of various future events. Consistent with the emotion-specific appraisal tendencies, angry participants perceived events caused by humans as more likely than did sad participants, who in turn perceived situationally caused events as more likely than did angry participants. In a second experiment (Experiment 2), participants were, following the emotion-induction procedure, asked to judge the causes of a mishap in a described scenario. Again consistent with the appraisal-tendency approach, angry participants saw other people as more responsible for the mishap than did sad participants, who instead perceived impersonal factors as more responsible than did angry participants.

Additional support for the attributional content of anger comes from Quigley and Tedeschi (1996). They observed a dynamic relationship between feelings of anger and blame attributed to another person. Not only did more anger lead to stronger blame attributions. The converse relationship was also true, such that stronger blame attributions reinforced the experience of anger. Furthermore, Goldberg et al. (1999) found that anger evoked in an initial situation increased the willingness in a subsequent situation to punish a person whose negligent or reckless behavior caused harm to an innocent victim. Interestingly, the relationship between anger and punitiveness was moderated by participants' knowledge of whether the wrongdoer who elicited the initial anger reaction was punished for his actions or not. Specifically, anger led to punitiveness in the subsequent judgments only if the initial wrongdoer had escaped punishment. The latter finding clearly supports the functional view of emotions, by demonstrating that appraisal tendencies continue to influence

cognition if the goal activated by the experienced emotion (e.g., to punish the wrongdoer) is not satisfied, but cease to exert any influence as soon as the goal has been fulfilled.

Processing effects. As mentioned previously, studies comparing positive and negative affect have typically found that positive feelings lead to relatively heuristic and shallow processing, whereas negative feelings give rise to more systematic and deep processing (Schwarz & Clore, 1996). Valence-based approaches to emotion took this to indicate that valence (i.e., the positivity or negativity experienced) is the main predictor of whether heuristic or systematic processing will result from an emotional state. However, a purely valence-based explanation cannot account for more recent findings that deviate from the typical pattern. A number of studies have documented differences in processing among negative emotions. For instance, it has been found that anger leads to heuristic processing whereas sadness causes more systematic processing (Bodenhausen, 1993; Bodenhausen, Kramer, & Süsser, 1994; Lerner, Goldberg, & Tetlock, 1998).

Researchers taking an appraisal view of emotions can better account for the deviations from the predictions of valence-based approaches. Tiedens and Linton (2001) suggested that processing differences can be understood in terms of the appraisal patterns associated with specific emotions. Specifically, the certainty dimension found by Smith and Ellsworth (1985) to be central to a number of affective states has explanatory potential in this regard. Tiedens and Linton (2001) reviewed research from various domains that indicate that the certainty dimension is particularly relevant. For instance, in a study on individual differences, Weary and Jacobson (1997) showed that people who feel chronically uncertain about causal relations are more prone to systematic processing than people who feel certain. In addition, the idea that uncertainty motivates effortful cognitive processing has long been central in theories of social cognition (Festinger, 1954; Kelley, 1973) and persuasion (Chen & Chaiken, 1999). Accordingly, emotions that are characterized by uncertainty appraisals (e.g., fear, surprise, sadness) should promote relatively systematic processing, whereas emotions associated with certainty appraisals (e.g., anger, happiness, disgust) should encourage relatively heuristic processing. In a series of experiments, Tiedens and Linton (2001) obtained support for these predictions. First, they found that the level of certainty/uncertainty brought about by the induction of different emotions influenced the level of certainty experienced in subsequent tasks (Experiment 1). Second, certainty-associated emotions (anger and contentment) lead to a greater reliance on the source of the communication as a cue to persuasion, indicative of heuristic processing, than did uncertainty-related emotions (worry and surprise; Experiment 2). Correspondingly, disgust (associated with certainty) made participants more likely to apply stereotypes in their social judgments than did fear (associated with uncertainty), suggesting more heuristic processing in the disgust condition (Experiment 3).

A direct comparison of anger and sadness was made by Bodenhausen, Sheppard, and Kramer (1994). They found that participants induced to feel anger were more inclined to rely on stereotypes in a social perception task than participants induced to feel sadness. In addition, angry participants displayed more heuristic processing than sad participants in a persuasion setting. Compared with sad participants, angry participants were more affected by heuristic cues pertaining to the source of the message. Specifically, angry participants were more persuaded by a message presented by a professor than by the same message presented by a college student, whereas sad participants were not influenced by the source. Although Bodenhausen, Sheppard et al. (1994) did not interpret their findings as a result of the different appraisal patterns associated with anger and sadness, the results are supportive of the notion that anger typically promotes heuristic, shallow processing, whereas sadness encourages systematic, deep processing. (For a recent review on the cognitive consequences of anger, see Lerner & Tiedens, 2006.)

Implications for Investigative Psychology

A number of predictions can be made regarding how anger and sadness may differently affect judgments in an investigative setting. In the following sections, I will briefly outline the most obvious implications of the appraisal-tendency framework (Lerner & Keltner, 2000, 2001).

Guilt Judgments

One of the central features differentiating anger and sadness is their respective positions on the dimension human-situational control (Keltner et al., 1993; Smith & Ellsworth, 1985). The experience of anger entails the perception that someone other than the self is responsible for a negative event, and an appraisal tendency associated with anger is therefore to attribute the causes of events to human rather than situational factors. Sadness, in contrast, is associated with a perception that a negative event has occurred because of circumstances unrelated to any specific person, and the appraisal tendency is therefore to make situational rather than human causal attributions. Previous studies have shown that anger increases the tendency to ascribe guilt to persons responsible for ambiguous negative events and the motivation to punish the persons (Goldberg et al., 1999; Lerner et al., 1998). A similar influence would be expected on investigators' guilt perceptions when investigating a criminal case. Thus, if an investigator reacts to a criminal event by becoming angry this may increase the guilt attributed to the person he or she perceives as responsible for the crime. It is important to note that such influence may occur even when the suspect is not the original source of the investigator's anger. Because of the tendency of cognitive appraisals to carry over to subsequent situations (Lerner & Keltner, 2000), guilt perceptions may become inflated due to the investigator's anger over such unrelated factors

as uncooperative witnesses or the difficulty to convince colleagues of his or her personal interpretation of the case.

Reliability Judgments

Causal attribution is likely to play a role also when investigators gauge information provided by witnesses of a crime. To understand how, it is useful to identify the factors that contribute to a statement's reliability. Roughly, these factors can be divided into three categories: witness variables, situational variables, and offender variables (see Brewer, Weber, & Semmler, 2005, for a similar distinction). Witness variables encompass factors pertaining to the witness as an individual, such as age, gender, cognitive ability, and social background. Situational variables include aspects of the particular situation in which the observations were made, such as viewing distance, lighting conditions, degree of violence, and number of perpetrators. Finally, offender variables refer to features of the perpetrator of the witnessed event, such as ethnicity, length, disguise, and clothing. Particularly the distinction between witness and situational variables is relevant for the predictions of emotion-related differences in reliability judgments. Upon juxtaposition, it appears that these two categories correspond well to the respective poles on the appraisal dimension human-situational control central to anger and sadness. Hence, because anger is known to promote a tendency to perceive human factors as responsible for observed outcomes, it could be expected that an angry investigator would find variables pertaining to the witness to contribute greatly to the reliability of the statement. In contrast, because sadness activates the tendency to attribute outcomes to situational factors, sad investigators would be expected to perceive factors inherent in the witnessing situation as particularly relevant to the statement's reliability. In other words, anger and sadness may exert their influence on reliability judgments by shifting investigators' attributional focus towards witness and situational variables, respectively.

Evidence Interpretation

To reiterate, criminal investigation is a theory-driven enterprise, meaning that the search for and interpretation of new information is guided by the expectations and hypotheses that investigators hold regarding the case (Innes, 2002; Wagenaar et al., 1993). Ideally, these expectations and hypotheses should be updated in response to new information, such that investigators' mental representations of the case progress towards increasingly accurate reflections of the true state of the world. However, if such accommodation does not occur, the interpretation of information may instead become biased to fit previous expectations. Relatedly, information search may become overly focused on supporting rather than disconfirming evidence, to the effect of tailoring the information base to the investigators' hypothesis rather than the opposite. I suggested previously that

time pressure and need for closure may promote such investigative confirmation bias. Based on research on the effects of specific emotions, it can be expected that anger may have a similar effect.

Anger has been found to increase the reliance on general knowledge structures as a basis for social judgments. For instance, Bodenhausen, Sheppard et al. (1994) found that anger, as opposed to sadness and neutral emotion, led to more stereotypic judgments. Similarly, anger typically results in the reliance on relatively heuristic inference strategies (Bodenhausen, Sheppard et al., 1994; Lerner et al., 1998; Tiedens, 2001; Tiedens & Linton, 2001). Accordingly, the use of prior expectations to guide judgment and inference drawing should increase as a function of anger in criminal investigations. Angry investigators may thus fall prey to confirmation bias to a larger extent than investigators in a neutral emotional state. Sadness, in contrast, is known to promote more systematic processing and attention to individuating details rather than general knowledge representations. Hence, sadness would serve to reduce the influence of confirmation bias on investigative judgments. In practical terms, a greater sensitivity to information inconsistent with prior expectations and hypotheses and more thorough processing of case-specific details would be predicted for sad, as opposed to angry, investigators.

HINDSIGHT BIAS

The judicial system poses numerous situations where legal actors must judge the probability of an event occurring in hindsight; that is, when they already know that the event has or has not taken place. For instance, in a trial against a defendant whose negligence is considered to have caused a serious accident, judges and members of a jury face such a task. Despite knowing that the accident did in fact occur, they must disregard their outcome knowledge and estimate the defendant's beforehand knowledge, and the a-priori probability of his behavior causing an accident, when determining negligence. A similar problem presents itself when a judge is to determine whether a disputed piece of evidence is to be deemed admissible as evidence in court. For example, if a defendant's confession may have been produced by coercive interrogation techniques, the judge must try to discount his knowledge of the outcome (i.e., the confession) and assess only the foresight probability of the outcome given the preceding circumstances (i.e., the interrogation techniques used). Because of the abundance of legal judgments made in hindsight, it is important to understand the cognitive processes involved in estimating probabilities in the presence of outcome knowledge. Research on the *hindsight bias* suggests that people are generally not apt to make such judgments, and this literature will be reviewed in the next section. I will also discuss the existing research on hindsight judgments in legal settings. Finally, I will outline a potential consequence of hindsight bias for tasks set before criminal investigators.

Basic Research

Hindsight bias was defined by Hawkins and Hastie (1990) as “the tendency for individuals with outcome knowledge (hindsight) to claim that they would have estimated a probability of occurrence for the reported outcome that is higher than they would have estimated in foresight (without the outcome information)” (p. 311). It is thus the tendency to overestimate the likelihood of an observed outcome compared with its foresight predictability (Fischhoff, 1975). The first demonstrations of the phenomenon were presented in a series of experiments by Fischhoff (1975). He asked participants to consider the probability of a number of alternative outcomes of a historical or clinical event, and provided some participants with information about the actual outcome. Those who made the judgments in hindsight (i.e., knew the actual outcome) rated the observed outcome as more probable than did participants who made the judgments in foresight. The difference appeared although participants were instructed explicitly to disregard their knowledge of the outcome and to make the judgments as if they did not know the actual outcome.

Since the seminal work of Fischhoff, the hindsight bias has spurred a great amount of research. For a meta-analysis of studies on the phenomenon, including research completed through the year 1989, Christensen-Szalanski and Willham (1991) retrieved a total of 122 independent effect sizes. A decade later, in a new meta-analysis of research completed through 1999, Guilbault, Bryant, Brockway, and Posavac (2004) reported a total of 252 independent effect sizes. Research on hindsight effects thus appears to be an area under constant development. Although the hindsight bias has been tested in a wide range of contexts and with a number of potential moderator variables, both of the above meta-analyses confirmed that it is a robust phenomenon that seems to generalize across many different situations.

A popular way to demonstrate the hindsight bias in early experiments was to let participants estimate the predictability of future or past events. For instance, Fischhoff and Beyth (1975) asked participants to rate the probabilities of different outcomes of a current news event (President Nixon’s trips to Beijing and Moscow in 1972) before and after it occurred. Compared with their foresight predictions, participants rated the outcomes they thought had occurred as more likely in hindsight. Similarly, events that participants thought had not occurred were rated as less likely in hindsight than in foresight. Thus, although the same participants made both “before” and “after” judgments, their likelihood estimates differed as a function of outcome beliefs. Other studies using real-life events as the targets of probability judgments reported similar findings (e.g., Pennington, 1981; Wasserman, Lempert, & Hastie, 1991).

A second paradigm for the study of hindsight effects is the use of almanac trivia questions as the targets of probability judgments. In these studies, participants are presented with questions about world-knowledge facts (e.g., “What is the capital of Indonesia?”), and are asked to estimate the probability

that their own answers to the questions are correct (foresight), or the probability that they would have answered the questions correctly if they had not been told the answer (hindsight). The results of these studies parallel those of studies examining probability judgments of real-life events. That is, people generally exaggerate the likelihood that they would have known the answers to the questions after receiving the correct answers (e.g., Fischhoff, 1977; Wood, 1978). The meta-analyses of Christensen-Szalanski and Willham (1991) and Guilbault et al. (2004) both found the hindsight bias to be more pronounced in studies involving almanac questions than in studies using real-life events. A possible explanation for this difference is that people may be more strongly motivated to impress others with their ability to answer almanac questions than with their ability to predict events, because it is prestigious to possess a lot of general knowledge (Guilbault et al., 2004).

In addition to being a stable finding across various settings, the hindsight bias is relatively impervious to debiasing attempts. Numerous studies have tried to identify ways to reduce the consequences of the bias, most of which have failed the task. Among the methods that have proven inefficient are instructions to participants to recall their foresight probability judgments (Fischhoff & Beyth, 1975), warnings of the potential influence of the bias (Fischhoff, 1975), and increasing participants' motivation to avoid the bias (Fischhoff, 1977). Some reduction of the bias has been found in studies where participants are encouraged to consider alternative outcomes and provide reasons for each of the outcomes (Arkes, Faust, Guilmette, & Hart, 1988). However, it appears that no available technique serves to completely eliminate hindsight effects.

Hindsight Bias in Legal Contexts

Several researchers have acknowledged the relevance of hindsight effects to judgments and decisions made within the legal system. The majority of experimental studies in this domain have focused on liability and negligence judgments in civil-law suits. Casper, Benedict, and Kelly (1988) placed their participants in the role of jurors in a case where the plaintiff claimed that the police had made an unwarranted search of his apartment. The participants received information of the circumstances leading up to the search, a description of the search procedure, and different information about the outcome of the search (drugs were found in the apartment, no drugs were found, or no outcome information). As expected, participants' outcome knowledge influenced their perception of the case, such that lower damage awards were given to the plaintiff when the search had turned up drugs. In addition, the "guilty" outcome led to more incriminating interpretations of the case; participants in this condition were less likely to believe that the police had used excessive force during the search and that the plaintiff's civil rights had been violated. Kamin and Rachlinski (1995) made a more direct test of the hindsight bias by comparing people's

judged probability of a natural disaster, causing material damage, in the presence or absence of outcome knowledge. After receiving information regarding the circumstances preceding the disaster, hindsight participants (knowing it had occurred) perceived a flooding disaster as more probable than did foresight participants (not knowing whether it would occur). As a consequence, 57% of hindsight participants believed the municipality had displayed negligence by not taking precautions to prevent the flooding, compared to only 24% of foresight participants. These findings were replicated by Hastie, Schkade, and Payne (1999), in a study of judgments of liability for punitive damages. LaBine and LaBine (1996) examined citizens' perception of malpractice in a therapist's treatment of a potentially dangerous patient. Participants read a short case scenario and one of three outcomes of the case: The patient had engaged in violent actions, the patient had not displayed violent behavior, or the outcome was not specified. Consistent with a hindsight bias, participants in the violent-outcome condition rated the violence as more foreseeable and the therapist's treatment to be less reasonable than did participants in the other conditions. Accordingly, the therapist was seen as negligent by 24% of the participants in the violent-outcome condition, compared with only 6% and 9% in the non-violent and unspecified-outcome conditions, respectively.

A couple of studies have documented the existence of hindsight bias with regard to judgments in criminal cases. Bodenhausen (1990) found that mock jurors' interpretation of a case was influenced by their knowledge of the outcome of a prior criminal trial of the same case. Specifically, the evidence was perceived as more incriminating when the defendant had previously been found guilty, and less incriminating when the defendant had been found not guilty, compared with an unknown-outcome condition. Bryant and Brockway (1997) studied hindsight effects in relation to the well-known trial of O. J. Simpson. Participants rated the probabilities that Simpson would be convicted and acquitted both before and after the verdict was announced. The typical hindsight effect was displayed, where the a-priori probability ratings for a conviction decreased considerably immediately after participants became aware of the acquittal verdict. The rated probability of an acquittal did not change immediately following the verdict, but had increased significantly one week later. Taken together, the above studies strongly suggest that hindsight bias has considerable potential to influence legal judgments. The findings indicate that people engaging in legal reasoning in the presence of outcome knowledge reinterpret the past to create an account that predicts the observed outcome.

Implications for Investigative Psychology

Although previous studies have clearly established the relevance of hindsight effects to the judicial system, they have focused exclusively on judgments made in a simulated trial setting or captured citizens' reactions to trials. Hence, the existence of hindsight bias in the tasks performed in a criminal investigation is as

of yet undocumented. There is, however, reason to suspect that criminal investigators would be influenced by outcome knowledge in a manner similar to other groups. It is true that criminal investigators differ markedly from the general population in the level of expertise and familiarity with legal matters, but several studies have shown that experts in various domains are susceptible to the same hindsight bias as novices (e.g., Anderson, Lowe, & Reckers, 1993; Arkes, Wortmann, Saville, & Harkness, 1981; Berlin, 2000). In fact, the meta-analysis by Guiltbault et al. (2004) revealed no difference in the magnitude of the hindsight bias between novices and experts.

One of the most obvious situations where police officers may fall prey to hindsight bias is the acquisition and evaluation of witness identification evidence. The administration of a lineup is a very good example of situations where investigators face an identical set of information before and after the outcome of the critical event. That is, the lineup members are the same before and after the witness has made an identification decision, whereas the result is known only in hindsight. Drawing on previous research on hindsight bias, it would be predicted that the outcome of a lineup affects the perception of the lineup's composition. Because the knowledge of an occurrence increases people's tendency to perceive causal determinants of the observed outcome, a witness' identification of a lineup member may make investigators increasingly attentive to information that predicts the selection of that particular member. One such predictor is obviously the fact that the identified person is the perpetrator. However, there may be aspects of the lineup itself that makes one member more likely to be selected than the others. For instance, one of the members may match markedly better than the others with the witness' offender description. Alternatively, some distinct feature (e.g., birthmark, facial hair, skin color) may make one of the members appear to stand out from the rest. A lineup including such aspects is said to be suggestive (Brigham, Ready, & Spier, 1990; Malpass & Lindsay, 1999). Investigators may reinterpret the lineup in light of the witness' identification decision, perceiving the lineup as more suggestive towards the selected member after, as opposed to before, the identification. Other actors in the legal systems may be affected in similar ways. For instance, judges' deciding on the admissibility of witness identification evidence may be more likely to perceive a lineup as unfair because of their knowledge that the defendant was identified.

The existence of hindsight bias in judgments of lineup suggestiveness would constitute a variant of the bias that differs from most previous demonstrations. While the majority of these studies are concerned with judgments based on relatively abstract information (e.g., verbal descriptions), judgments of lineup suggestiveness are made on the basis of concrete perceptual input. Critics might argue that such tangible information does not lend itself to subjective reinterpretation to the extent necessary to produce hindsight bias. However, recent research shows otherwise. Harley, Carlsen, and Loftus (2004) presented degraded pictures of celebrity faces that gradually became clearer and asked

participants, after the face had been recognized, to estimate the difficulty a naïve observer would have identifying the face. Participants displayed a visual hindsight bias by consistently predicting better performance on the task for others than they had performed themselves. Apparently, they were unable to discount their knowledge of the identity of the pictured faces, thus creating the illusion that it could be “seen all along”. Although the degraded-picture task is distinctly different from judging lineup suggestiveness, the finding of Harley et al. (2004) proves the relevant point that perceptual tasks may become the subject of hindsight distortion.

SUMMARY OF EMPIRICAL STUDIES

At this point it should be clear that a number of factors present in investigators’ work environment can seriously bias human judgments and decisions. In the interest of increasing the objectivity and effectiveness of the judicial system, it is therefore imperative to study how these factors may influence the cognitive tasks performed in criminal investigations. The theoretical frameworks developed in the areas of motivated cognition, emotion and cognition, and hindsight bias provide predictions as to how such influence might manifest itself in an investigative setting. By putting these predictions to empirical tests, potential pitfalls in investigators’ work can be identified. In addition, the results can improve our understanding of the biases that have been observed in real-life criminal investigations. The empirical work presented in this thesis sought to test four of the predictions presented in the previous section, namely those concerning confirmation bias (Study I), asymmetrical skepticism (Study II), hindsight bias (Study III), and the effects of specific emotions (Study IV).

Study I

Study I examined the possibility that investigators rely on biased inferential strategies when motivated to confirm a particular hypothesis regarding a crime. It was expected that the interpretation of an identical set of ambiguous evidence would differ between investigators who endorsed opposing hypotheses, such that more support would be perceived for their own hypothesis than for the alternative hypothesis. This finding would demonstrate a confirmation bias. In addition, it was expected that the confirmation bias would be more pronounced among investigators high (vs. low) in need for cognitive closure. This prediction rested on previous findings that high-NFC participants tend to “freeze” on their initial hypothesis, and thus are more strongly motivated to see the hypothesis confirmed (Kruglanski & Webster, 1996).

Experiment 1

The sample in Experiment 1 consisted of 50 Swedish police officers with experience from investigations of serious crimes, such as robbery, rape, assault, and homicide. The investigators were presented with a condensed case material containing the observations made in the preliminary investigation of a homicide, where a prime suspect had been identified. A manipulation of investigators' initial hypothesis regarding the case was incorporated in the background information provided prior to the case material. One half of the participants was informed about a potential motive for the prime suspect to kill the victim, whereas the other half was made aware of a potential alternative culprit. Thus, participants supposedly approached the case material with different hypotheses in mind, depending on whether they were led to assume the guilt of the prime suspect or to consider alternative interpretations of the evidence. All information included in the case material (i.e., evidence, observations) was identical for the two conditions. Participants were asked to make a set of judgments concerning the case based on their interpretation of the case material. These judgments included perceptions of (a) the likelihood that the prime suspect was guilty, (b) the extent to which the evidence linked the suspect to the crime, (c) the extent to which the criteria for "probable cause" were fulfilled, and (d) the adequacy of the evidence to prosecute the suspect. In addition, participants were asked to rate ten of the observations presented in the case material with regard to how strongly each indicated that the suspect was guilty or innocent. Finally, participants' individual need for cognitive closure was measured using the Need for Closure Scale (NFCS; Kruglanski & Webster, 1994).

The results of Experiment 1 gave mixed support for the hypothesized effects; only moderate trends in line with the predictions were found. Participants who entertained the hypothesis that the suspect had a motive for the murder did perceive the case material to indicate more strongly that the suspect was guilty, compared with those made aware of a potential alternative culprit. However, the difference between conditions did not achieve statistical significance. Similarly, the moderating influence of participants' level of NFC was weak. Participants high (vs. low) in NFC made judgments that were more in line with their initial hypothesis, suggesting a stronger confirmation bias, but this effect also failed to reach statistical significance. Practically no differences between participants' ratings of the case observations were found as a function of initial hypothesis or NFC. However, there was a marginally significant trend showing that low-NFC participants were more prone than their high-NFC peers to identify observations as inconsistent with their initial hypothesis. Thus, high-NFC participants perceived the observations as more unequivocal support for their hypothesis, and focused less on the ambiguities and discrepancies of the case material. This finding provided indirect support for the hypothesis that NFC would moderate the strength of the confirmation bias.

One particular shortcoming of Experiment 1 places restrictions on the interpretation of the results. The manipulation of the initial hypothesis was intended to create one group that presumed guilt and another group that presumed innocence of the suspect. However, the results showed that participants in both groups believed the suspect to be guilty, and differed only slightly in the strength of that belief. The implication is that Experiment 1 did not provide a valid test of the hypothesized initial hypothesis \times NFC interaction.

Experiment 2

A second experiment was set up to test the hypothesis of Experiment 1 in a non-expert sample, consisting of 68 students at Göteborg University. The major reason for choosing this sample was that students might be more easily influenced by the initial hypothesis manipulation. Ideally, criminal investigators should be inclined to spontaneously think in terms of alternative hypotheses for a crime because of prior experience, but students should be less so inclined. Hence, students were expected to embrace more willingly the hypothesis provided to them in the background information (implying either a suspect motive or an alternative culprit), and exhibit a stronger confirmation bias. The material presented to the student sample was identical to that of Experiment 1. The dependent variables were also essentially the same, except that the ratings of the fulfillment of probable cause and the adequacy of the evidence for prosecution were excluded. Instead, a question tapped participants' perception of the plausibility of the suspect's denial of the crime. Finally, the NFCS was administered.

In contrast to the police sample, students were significantly affected by the initial hypothesis manipulation. Specifically, participants provided with a potential motive of the suspect perceived it as more likely that the suspect was guilty, rated the suspect's denial as less plausible, and judged the case observations to indicate guilt more strongly, compared with those provided with the contrasting hypothesis. These results provide converging support for a confirmation bias in the interpretation of the case material. Contrary to expectations, however, participants' level of NFC did not moderate the strength of the confirmation bias. Thus, there were no differences in the perceptions of the case material as a function of participants' individual desire to achieve closure.

Discussion

The results of Study I gave some support for the prediction that reasoning about criminal evidence is susceptible to a confirmation bias. Participants (particularly in Experiment 2) made judgments of the case material that conformed to the hypothesis that had been initially presented to them. Thus, the results demonstrate that the same criminal evidence can be interpreted in markedly

different ways depending on the expectations brought into the situation. Another significant finding is the fact that students were significantly influenced by the initial hypothesis manipulation, whereas criminal investigators were not. At first glance, this result suggests that investigators had a more critical view of the evidence contained in the case material, considering alternative interpretations even when they were not implied in the hypothesis manipulation. However, a closer inspection of the data shows that investigators were insensitive to the manipulation because they tended to view the suspect as guilty regardless of the information conveyed through the manipulation. Students, on the other hand, refrained from ascribing guilt to the suspect when the possibility of an alternative perpetrator was made salient, suggesting a more critical evaluation of the evidence. This tendency of investigators to presume guilt parallels previous research findings that police officers tend to view suspects as very likely to be guilty (Baldwin, 1993; Leo, 1996; Meissner & Kassin, 2002). Finally, neither experiment provided substantial support for the prediction that high- (vs. low-) NFC participants would exhibit stronger confirmation bias. However, manipulation checks revealed that the participants' individual level of NFC did not influence their approach towards the experimental task as expected; high-NFC participants did not complete the experimental task sooner than did low-NFC participants. Thus, the data concerning the effects of NFC are somewhat inconclusive.

Study II

Study II investigated whether evidence with positive and negative implications for a favored hypothesis would be met with different levels of skepticism, as predicted by the quantity-of-processing principle. Specifically, witness evidence inconsistent (vs. consistent) with the hypothesis would be judged as less reliable, although it had been obtained under conditions identical to those of the consistent evidence. In addition, participants' level of NFC was expected to moderate the asymmetrical-skepticism effect. That is, because of the motivation to "freeze" on the initial hypothesis, participants working under high NFC would perceive the inconsistent evidence as more of a threat to the desired outcome (i.e., hypothesis confirmation). Consequently, high-NFC investigators would be more skeptical towards the inconsistent evidence, and rate it as less reliable, compared with low-NFC investigators. Finally, as a further consequence of the freezing mechanism, high-NFC investigators' confidence in the initial hypothesis would be less influenced by the evaluated evidence, compared with low-NFC investigators. Forty-nine experienced criminal investigators from two Swedish urban districts participated in the study.

Participants were presented with a one-page vignette summarizing the preliminary investigation of a homicide. This summary was similar to the case material used in Study I, but was more exhaustive and included no manipulation.

The vignette had been constructed to imply that the prime suspect in the case was guilty, and was intended to make participants adopt that as their working hypothesis. However, the material did not exclude the possibility of an alternative perpetrator. After having rated their confidence in the hypothesis that the suspect was guilty, participants read a brief summary of a witness statement, including a description of the conditions under which the crucial event had been witnessed and the statement had been given. A slight manipulation of the statement was made to create one consistent and one inconsistent witness statement, differing only with regard to the descriptions of two quarreling voices that had been heard in connection with the murder. The consistent version stated that the voices belonged to *two women* (i.e., consistent with the hypothesis that the female suspect had killed the female victim), whereas the inconsistent version stated that the voices belonged to *a man and a woman* (i.e., inconsistent with the hypothesis, and suggesting an unknown male perpetrator). Having read one of the two versions, participants rated the perceived statement reliability and witness credibility on a number of dimensions. Finally, participants were asked to once again rate their confidence in the hypothesis that the suspect was guilty, allowing them to adjust their ratings in response to the new information provided by the witness. As a manipulation of NFC, one half of the participants was randomly assigned to complete the experiment under time pressure (high NFC), whereas the other half had no time constraints (low NFC).

The asymmetrical-skepticism hypothesis received strong support from participants' ratings. As expected, the inconsistent witness was perceived as less credible, and its statement as less reliable, than the consistent witness. Thus, participants were more skeptical towards the source of evidence that contradicted (vs. confirmed) the hypothesis under consideration. Contrary to predictions, the asymmetrical-skepticism effect was found to be slightly more pronounced among low-NFC participants, compared with their high-NFC peers, but not significantly so. However, the impact of the witness information on participants' confidence in the working hypothesis was in accord with the predictions. In the low-NFC group, considerably higher post-witness confidence was expressed by those having read the consistent witness statement, compared with those having read the inconsistent statement. In the high-NFC group, in contrast, no difference in confidence was observed as a function of witness version. Instead, participants in the latter group based their post-witness confidence ratings almost entirely on their confidence in the hypothesis prior to reading the witness statement. This finding shows that investigators motivated to achieve closure were more inclined to "freeze" on their position based on the initial information base, and more reluctant to adjust their position in light of subsequent evidence.

Discussion

The demonstrated asymmetrical-skepticism effect is particularly compelling considering the fact that investigators' judgments regarded aspects (e.g., witnessing conditions) that were identical across conditions, and were not related to the manipulated variable (i.e., witness consistency). Thus, from a strictly objective point of view, the two witnesses and their statements should be judged as equally credible and reliable. Nevertheless, participants differed considerably in their perception of the two versions, illustrating the pervasive influence of prior expectations on the evaluation of witness evidence. In addition, it should be kept in mind that the observed effects were produced by a minimal manipulation of the witness statement; only a few words differed between the two versions. Study II also demonstrated that the epistemic motivation of an investigator can be an important determinant of the evidential weight assigned to a witness statement. Participants working under a heightened need for closure were practically unaffected by the information conveyed by the evaluated witness. This indicates that prior belief may be a powerful information source in investigations where cognitive closure is an important motivator, so powerful that it may eliminate the influence of subsequent evidence. No support was found for the hypothesis that participants working with a high (vs. low) NFC would exhibit a more pronounced asymmetric-skepticism effect. In contrast, the data indicated a weak but consistent tendency in the opposite direction. This finding is incongruent with the theoretical assumption that preference-inconsistent information elicits more intense cognitive analysis than does consistent information, but concurs with previous research showing that time pressure tends to decrease processing intensity overall (Svenson & Maule, 1993).

Study III

The literature on hindsight bias indicates that outcome knowledge has the potential to alter perceptions of the predictability of events across a wide range of contexts. Upon learning the actual outcome of an event, people tend to reinterpret the past in ways that make the observed outcome appear more inevitable in hindsight than they did in foresight. Study III was conducted to test whether outcome knowledge exerts a similar influence on lay people's and police officers' perception of lineup suggestiveness. It was predicted that a witness' decision to identify the target member of a lineup as the perpetrator would strengthen the impression that the lineup was biased towards the target. This was expected because knowledge of the identification would increase the salience of lineup aspects predictive of that particular outcome. Conversely, a witness' decision to refrain from making an identification was expected to reduce the perceived suggestiveness of the lineup. Obviously, the outcome is less likely to be attributed to suggestive aspects of a lineup when the target member is not selected.

Experiment 1

Fifty university students read an offender description provided by an eyewitness to an armed robbery. They were told that the witness had been called to the police station for an attempt to identify the perpetrator in a photographic lineup. Participants were shown six photographs and were informed about which lineup member was the police's suspect. As the experimental manipulation, participants were told one of three outcomes of the lineup administration: In the positive outcome condition, it was said that the witness had identified the suspect as the perpetrator. In the negative outcome condition, the witness was said to have refrained from making an identification. Finally, in the unknown outcome condition, no information as to the witness' decision was given. After receiving the outcome information, participants rated the lineup on a number of dimensions related to suggestiveness.

Participants displayed the predicted effect of positive outcome. When the target had been identified, the lineup was perceived as significantly more suggestive than in the absence of outcome information. Positive outcome also influenced participants' perception of the match between the foils (i.e., lineup members known to be innocent) and the witness' offender description. As expected, the rated foil-to-description match was significantly lower in the positive outcome condition than in the unknown outcome condition. There was also a marginally significant tendency of participants in the positive outcome condition to perceive the foils as less similar to the target, compared with participants in the unknown outcome condition. These findings were all in line with the hypothesis that outcome knowledge would increase the salience of aspects that are predictive of the observed outcome. However, the influence was limited to the positive outcome condition. Participants who were informed that the witness had not made an identification did not differ in their ratings of the lineup from those who were given no outcome information. Thus, the hypothesis that a negative outcome would reduce perceptions of lineup suggestiveness was not supported.

Experiment 2

A second experiment was carried out with the intention to replicate the findings of Experiment 1 under more realistic conditions. Two specific aspects of the first experiment limit the generalizability of its results. First, the population studied (university students) is a group that is unlikely to find judgments of lineup suggestibility very personally relevant. Their general lack of experience with legal matters may make them especially susceptible to extralegal factors and prone to bias, as the size of the hindsight bias has been found to be negatively correlated with familiarity with the judgment task (Christensen-Szalanski & Willham, 1991). Second, the judgments in Experiment 1 were made in a context that does not accurately reflect the circumstances surrounding actual investigative judgments.

Typically, police officers and others involved have a certain degree of knowledge about the case in which the lineup takes place. This knowledge forms the basis for expectations and beliefs about the case, which means that the outcome of the lineup is interpreted in light of a broader context, rather than in complete isolation (as in Experiment 1). Possibly, the biasing effect of outcome knowledge is smaller in the real world, because a positive identification may be attributed to other factors (e.g., that the target is actually guilty) than lineup suggestiveness. To address these limitations, Experiment 2 was carried out with police trainees as participants, and with the lineup embedded in a larger case material. In addition to the predictions posited for Experiment 1, we hypothesized that participants' beliefs about the case would function as a moderator of the effects of outcome knowledge. Specifically, those strongly convinced that the target was guilty would be less likely to attribute a positive identification to lineup suggestiveness. The rationale for this hypothesis rests on the universal tendency of people to display belief perseverance (Anderson, Lepper, & Ross, 1980; Lord et al., 1979). Thus, the reluctance to abandon a strong existing beliefs, and the motivation to confirm prior expectations, would make convinced participants unwilling to acknowledge potentially suggestive aspects of the lineup as the cause of a positive identification.

In contrast to Experiment 1, there was a significant effect of negative outcome on participants' ratings of lineup suggestiveness. In line with predictions, the lineup was perceived as significantly less suggestive when the witness had refrained from making an identification than when no outcome knowledge was available. There was, however, no effect of positive outcome on the suggestiveness ratings. Neither was there any significant interaction between identification outcome and the strength of participants' belief in the target's guilt. Thus, it appeared that prior belief did not moderate the influence of positive outcome on perceptions of suggestiveness.

Discussion

The results of both Experiments 1 and 2 show that outcome knowledge, operationalized here as information regarding a witness' identification decision, may alter perceptions of the suggestiveness of a lineup. In Experiment 1, the decision to identify the target as the perpetrator increased participants' suggestiveness ratings. In contrast, participants in Experiment 2 made lower ratings of suggestiveness as a function of the witness' decision not to make an identification. Thus, under certain circumstances, people evaluate lineups differently in foresight and hindsight. These findings have important implications for any case involving eyewitness identification evidence. They suggest that it is difficult to assess suggestiveness by means of subjective judgments in a reliable manner. The personal opinions of police officers administering lineups, prosecutors using their results as a basis for a summons, or judges determining the admissibility of identification evidence are therefore at risk of being biased.

Unfortunately, research has shown that police officers constructing actual lineups usually rely on their subjective judgment when determining lineup fairness (Wogalter, Malpass, & McQuiston, 2004). The need for objective methods for achieving fair and unbiased lineups, expressed by several researchers (Wells et al., 2000), is thus further underscored by this study.

Somewhat more puzzling is the fact that positive outcome had the predicted effect in Experiment 1 but not Experiment 2. These disparate findings may be attributed to the methodological differences between the experiments, particularly with regard to the context in which the judgments were made. Possibly, the fact that participants in Experiment 2 possessed knowledge about the case served to eliminate the hindsight bias. In Experiment 1, participants had few cues as to why the witness chose to identify the target. Essentially, they did not know the grounds on which the target was suspected of the alleged crime, and could not assess the probability that he was actually the perpetrator. Hence, they were left with the properties of the lineup as the only available predictor of the observed outcome. In contrast, participants in Experiment 2 were presented with background information regarding the case and the evidence that implicated the target in the crime. In other words, they had a wider array of information to select from when attributing the identification outcome. Thus, the suggestiveness of the lineup may have been seen as relatively less contributing to the witness' decision when other plausible explanations, such as the actual guilt of the target, were available. The tenability of this account is strengthened by the fact that most participants in Experiment II saw it as highly likely that the target was guilty.

Study IV

Study IV examined the influence of emotion on investigative judgments. Drawing on the literature on emotion-specific appraisal tendencies, it was predicted that anger and sadness would exert different influences on (a) the way the reliability of a witness statement is assessed, and (b) the process whereby evidence is integrated to form a global judgment of a case. First, angry participants were expected to rely more on their perception of individual information pertaining to the witness than were sad participants when judging statement reliability. This prediction was derived from the fact that a central appraisal tendency associated with anger is the inclination to perceive personal factors as responsible for observed outcomes. Conversely, sad participants were expected to base their reliability judgments more on their perception of the circumstances of the witnessing situation than were angry participants. This follows from the appraisal tendency related to sadness to attribute outcomes to situational causes. Second, previous findings that anger promotes heuristic processing while sadness encourages systematic processing led us to expect that angry and sad participants would be differently sensitive to the detail of a witness

statement. Specifically, angry participants would rely heavily on their preexisting perception of the case (based on evidence received early), and hence be relatively unaffected by the implications of the statement. Sad participants, in contrast, would be tend to adjust their perception of the case in line with the implications of the statement, due to the detailed analysis of the message and elaborated integration of the statement with the other evidence in the case. Same as for Study II, we also expected an asymmetrical-skepticism effect, such that a witness statement would be consider more reliable when supporting, as opposed to contradicting, the central hypothesis of the investigation.

Sixty-one experienced criminal investigators participated in an experiment with a 2 (emotion: anger vs. sadness) \times 2 (statement consistency: consistent vs. inconsistent) design. In the first of what participants thought was two separate studies, participants were induced to feel either angry or sad by asking them to report an angering or saddening event that they had experienced in their service as police officers. Manipulation checks showed that the emotion induction successfully altered participants' experience of anger and sadness. For the alleged second study, participants were presented with a summary of an assault case. A single page of text explained the circumstances and preliminary findings of the investigation. In short, a 15-year old boy was found severely battered in an apartment where he lived with his mother. Suspicion was cast on the boy's father who had separated from the mother years before the offense, and had abused drugs ever since. Recently, he had acted threatening towards the mother and her son, urging them to lend him money, but had been turned down. Following the case summary, two witness statements were presented, the second of which was manipulated to be consistent or inconsistent with the hypothesis that the father was guilty of the assault. Participants were asked to rate the reliability of both statements, the trustworthiness of the witnesses, and the propitiousness of the witnessing conditions. The trustworthiness variable served as an operationalization of personal factors relating to statement reliability, whereas the witnessing-conditions variable represented situational factors. Finally, participants' global impression of the case was assessed by asking them to rate the probability that the father was guilty of the assault and the strength of the evidence against the father.

The predicted difference in attribution tendencies was partly substantiated by the results. As expected, the correlation between the ratings of the witnessing conditions and the reliability of the first witness statement was significantly higher for sad than for angry participants. In fact, the two variables were completely unrelated in the anger condition. This suggests that sad participants took into account situational factors when assessing the reliability of the statement, whereas angry participants did not. As for the trustworthiness variable, it predicted participants' reliability ratings in both the anger and sadness conditions. Although the observed correlation was somewhat higher for angry participants, the groups did not differ significantly in this regard. Hence, it

appears that both angry and sad participants attributed the statement's reliability to personal factors pertaining to the witness. Emotion had the predicted effect on participants' sensitivity to the detail of the second statement. When asked to rate the probability that the father was guilty of the assault, sad participants made higher ratings of guilt after having read the consistent witness statement than after having read the inconsistent statement. In contrast, angry participants did not differ in their guilt perceptions as a function of statement consistency. The same pattern was found for the ratings of the strength of the evidence against the father. These findings suggest that emotion affected the process through which participants' judgments were produced. Specifically, the tendency of sad participants to accommodate their case judgments to the second witness statement implies a detailed analysis and elaboration of its content. However, the insensitivity to the content of the witness statement indicates that angry participants engaged in relatively heuristic processing and relied on their preexisting perception of the case as a basis for their final judgment. Finally, the study partly replicated the asymmetrical-skepticism effect. In line with the results of Study II, the witness consistent (vs. inconsistent) with the central hypothesis of the investigation was seen as significantly less trustworthy and was assigned significantly less weight as evidence.

Discussion

Overall, Study IV was a successful application of cognitive-appraisal theories of emotion to the study of investigative judgments. The findings entail important practical implications. First, it seems that the impact of witness evidence may be determined in part by the subjective emotional state of an investigator. Although a given piece of evidence should receive an equal amount of attention and weight regardless of impertinent factors such as emotions, anger may make the actual implications of a witness account become overridden by an investigator's prior beliefs and expectations regarding the case. Second, anger may make investigators disregard the powerful influence that the witnessing situation may have on the reliability of a witness account. Instead, angry investigators may base their reliability assessments largely on factors pertaining to the witness itself. This, in combination with the reliance on heuristic processing known to result from anger, may also increase the influence of stereotypes. If, for instance, a witness would happen to belong to a group stereotypically associated with dishonesty, such category-based expectations might take precedence over individuating information about the witness and the witnessing situation.

There are also important theoretical implications of the results. Specifically, the distinction between witness and situational variables appears not only to be useful as a classification tool; it also seems to be a psychologically valid distinction. Emotions evidently influenced the extent to which investigators relied on situational variables as a basis for their reliability judgments. This result parallels previous findings in research on behavioral attribution, which have

shown that the tendency to take the influence of the situation into account depends on such factors as the identity of the actor (Jones & Nisbett, 1972) and the amount of cognitive resources available (Gilbert, Pelham, & Krull, 1988).

GENERAL DISCUSSION

The principal aim of this thesis was to study the influence of epistemic motives, hindsight bias, and emotion on the performance of criminal-investigative judgments. The role of such factors has been largely neglected in previous work on investigative psychology. The present research is thus a first step towards a systematic analysis of these issues. Drawing on recent theoretical developments in social and cognitive psychology, predictions were made as to how the above factors are likely to affect the judgments of individual investigators. Some of these predictions were then subjected to empirical tests in the experiments reported in this thesis.

Main Findings and Practical Implications

The reported empirical studies examined the influence of various factors, and employed different materials and procedures. However, rather than viewing the results of each study in isolation, a fuller appreciation of their significance is achieved when identifying commonalities and converging findings. In the following paragraphs, I will outline four broad categories that relate to different routes by which subjective factors are infused into the judgment process. I will also point out some of the most apparent consequences of such infusion in actual criminal investigations.

Displays of Confirmation Bias

Three of the four studies demonstrated that prior expectations regarding the nature of a crime may influence the way evidence is interpreted and evaluated. In Study I, the exact same set of crime-related facts was interpreted differently by participants entertaining different hypotheses regarding the crime (Experiment 2). In Studies II and IV, an information source was subjected to differing levels of scrutiny depending on whether it confirmed or contradicted prior expectations. These findings prove the intuitively plausible, but rarely documented, fact that different meaning can be assigned to ambiguous criminal evidence depending on the preconceptions that investigators bring into the situation. In cognitive terms, these observations can be conceptualized as expressions of the same underlying phenomenon, namely confirmation bias (Nickerson, 1998). Specifically, the hypothesis-consistent interpretation of ambiguous evidence is compatible with the motivation to perceive the world in ways that confirm an already existing belief. By the same token, the rejection of

hypothesis-inconsistent evidence in favor of consistent evidence reflects the general preference for information congenial with one's prior beliefs. In addition to illustrating confirmation bias, Studies II and IV implied asymmetrical skepticism as a mediating mechanism. That is, the perceived significance of inconsistent information can be reduced by discrediting the information source (e.g., a witness). Because reliability assessments of witness evidence typically lack objective standards and guidelines, they afford great latitude for subjective interpretation, which in turn allows for the operation of asymmetrical skepticism. The net effect is a reduced felt need to take into account information that runs counter to the central hypothesis of an investigation.

Given that police officers investigating a crime form working hypotheses regarding the likely perpetrator, mode of conduct, and motive (Innes, 2003; Wagenaar et al., 1993), the present findings show that such hypotheses may be perpetuated and unlikely to be rejected because of the manner in which information relevant to the hypothesis is processed. Regardless of the actual veracity of the hypothesis, an excessive focus on hypothesis confirmation may entail serious negative consequences. In the event that the hypothesis is false, costly time and resources will have been spent on pursuing a fruitless lead. Still worse, innocent suspects may have suffered from false accusations and imprisonment. In cases where the hypothesis turns out to be true, investigators' confirmation bias may reduce the tenability of the case in a court trial. The task of judges and jurors is to decide whether the hypothesis endorsed by the prosecution can be accepted "beyond reasonable doubt". This criterion is fulfilled only if the presented evidence is adequately explained by the hypothesis and cannot be accounted for in a reasonable manner by any alternative hypothesis (Bring et al., 1999). Skilled defense lawyers are certain to bring such alternative explanations to the court's attention unless there is overwhelming incriminating evidence. Therefore, in order to minimize the chances of a successful defense, and hence to secure the conviction of a guilty defendant, all reasonable alternatives to the prosecutor's hypothesis must be falsified prior to the court proceedings. However, there is an obvious risk that such falsification will not occur in investigations affected by a confirmation bias. If investigators interpret obtained evidence as unequivocal support for their pursued hypothesis, they may fail to realize that the evidence may be explained in other ways. Consequently, these alternatives are not proven false. In the end, the evidence does not meet the criteria posed by the court, the consequence being a failure to convict guilty defendants.

Processing Effects

A second class of findings concerns the processing strategies that investigators adopt when evaluating and integrating criminal evidence. This analysis rests on the conventional distinction between systematic, deep processing of information on one hand, and heuristic, shallow processing on the other (Chaiken & Trope,

1999; see Fiske & Neuberg, 1990, for a related distinction). The effects of two variables expected to affect depth of processing were examined in the present research; need for closure (NFC; manipulated via time pressure) in Study II, and specific emotional states (anger vs. sadness) in Study IV. In both studies it was found that conditions known to promote heuristic processing (high NFC and anger) reduced participants' tendency to accommodate their perception of a criminal case to the implications of a piece of witness evidence, compared with conditions known to produce more systematic processing (low NFC and sadness). Specifically, participants in the former conditions perceived the guilt of a suspect as equally likely, regardless of whether the witness statement was incriminating or exonerating to the suspect. In contrast, participants in the latter conditions became more certain of guilt following an incriminating statement, compared with an exonerating statement. This indicates that the heuristic-promoting conditions led participants to rely more on their mental representation of the case as it was before the introduction of the witness evidence. In support of this, the pre- and post-witness case ratings of high-NFC participants in Study II were more strongly correlated than the ratings of low-NFC participants. In essence, these studies show that variables affecting processing depth indirectly affect the extent to which investigators' judgments will be based on general, internal knowledge representations, as opposed to specific, external information. This pattern parallels previous research showing that heuristic processing, induced by either limited cognitive capacity/motivation or emotional states, tend to increase reliance on stereotypes and decrease reliance on individuating information in social judgments (Bodenhausen, Kramer et al., 1994; Fiske & Neuberg, 1990).

Conditions that promote heuristic processing may entail serious consequences in actual criminal investigations. The reduced sensitivity to detail may lead investigators to overlook exonerating information that should prompt a revision or abandonment of the focal hypothesis. The harmful consequences are considerable: First, innocent citizens who are unfortunate enough to become the subject of an investigation may be seriously disadvantaged. The chances that investigators drop their suspicion against innocents as a response to exonerating evidence is decreased, which may cause prolonged imprisonment and psychological suffering on the suspect's part. Second, potentially exonerating evidence that does not receive sufficient attention during an investigation may become a powerful weapon for the defense in court. Even if the evidence would not actually exonerate the suspect if properly investigated, the failure to do so weakens the prosecution's case dramatically. Finally, factors reducing depth of processing may increase the influence of stereotyping in criminal investigations. A stressed or angry investigator may base his or her judgment of a witness or a suspect on expectations stemming from the person's group membership rather than individuating information about the person. For instance, a suspect belonging to a group stereotypically associated with criminality may run a higher

risk of being distrusted in a police interrogation. Similarly, stereotypical expectations of dishonesty may damage the trustworthiness assigned to a witness. Recent evidence suggests that stereotypes may in fact influence the perception of witnesses in legal setting (Lindholm, in press). However, to my knowledge, the applicability of such bias to investigative judgments, and its potential emotional underpinnings, has not yet been documented.

The Influence of Outcome Knowledge

The third class of findings encompasses those obtained in Study III regarding judgments of lineup suggestiveness. To reiterate, the two experiments produced disparate findings. In Experiment 1, university students displayed a hindsight bias only in response to positive outcome information; knowledge that a witness had identified the target in a photographic lineup increased the perception that the lineup was biased against the target. In Experiment 2, however, police trainees showed a hindsight bias only with regard to negative outcome information; knowledge that the witness had refrained from making an identification decreased the perception that the lineup was biased against the target. It is unclear exactly why the two experiments yielded different effects. However, the differing contexts in which the judgments were made may provide a plausible explanation with regard to the presence and absence of an effect of positive outcome. Participants in Experiment 1 had very meager knowledge about the case in which the lineup was administered. Thus, when trying to explain the identification of the target, the only available cues were factors inherent in the lineup. In contrast, participants in Experiment 2 had access to a full description of the case and had formed an opinion about the likely guilt of the target. Since most participants considered this likelihood to be very high, they may have attributed the identification to the fact that the target was actually the person witnessed at the crime scene, rather than to suggestive aspects of the lineup itself.

Irrespective of the above inconsistencies, the fact remains that outcome knowledge has the potential to alter judgments in investigative settings. The case of lineup suggestiveness was chosen for Study III because it is a much debated issue and has received a lot of attention in previous research (see Brewer et al., 2005; Wells et al., 2000). However, hindsight effects would be expected for any type of judgment where the predictability of an observed event may be called into question. A particularly troublesome consequence of hindsight bias is that it may hinder police officers from learning from their own experience, creating overconfidence in their ability to make accurate judgments. To understand how, let us consider the example of deception detection. It is widely documented that people are generally not very apt at distinguishing between truthful and deceptive statements (Vrij, 2000). It could be expected that police officers, because of greater experience with veracity assessments, would perform better than people in general. However, several studies indicate that they do no better than the

general population (Ekman & O'Sullivan, 1991; Hartwig, Granhag, Strömwall, & Vrij, 2004; Vrij & Mann, 2001). In fact, despite equally poor performance, police officers tend to be more confident in their own ability to catch liars (Meissner & Kassin, 2002). It has been suggested that this poor performance is due to a lack of reliable feedback on police officers' judgments (DePaulo, Stone, & Lassiter, 1985; in DePaulo & Pfeifer, 1986). That is, they rarely know whether their decision to believe or disbelieve a suspect was correct or not. Even when the actual veracity of statements comes to light, however, it may not serve to improve investigators' detection ability or realism in self-evaluations. Because of the tendency to overestimate predictability in hindsight, the behaviors displayed by an exposed liar may be seen as obvious signs of deceit, creating an unwarranted belief that one would be able to catch the liar if the actual veracity was unknown. Such perceived predictability is largely illusory, because there are very few reliable and practically useful cues to deception in people's overt behavior (DePaulo et al., 2003). In addition, the cues that police officers report relying on are not diagnostic of deception (Strömwall, Granhag, & Hartwig, 2004). The long-term consequence of such misleading feedback is an increased self-evaluated deception-detection ability without a corresponding increase in actual skills. In other words, the hindsight bias may exacerbate police officers' overconfidence.

Attributional Effects

A final notable finding of the present research is the potential of specific emotional states to influence cue utilization in investigators' reliability judgments. When judging the reliability of a witness account, angry participants in Study IV took into account factors pertaining to the witness as an individual, but not information regarding the situation in which the witnessing took place. In other words, higher perceived trustworthiness of the witness was associated with higher reliability ratings, but there was no correlation between the perceived propitiousness of the witnessing conditions and reliability. In contrast, sad participants' reliability ratings were significantly related to perceptions of both witness and situational factors. The observed pattern suggests that angry and sad participants weighted situational cues differently when determining reliability. Such attributional differences were indeed predicted on the basis of previous research. The cognitive appraisals involved in the experience of anger and sadness have been found to promote an attributional focus on personal and situational factors, respectively. That is, angry perceivers tend to view other persons as responsible for observed events, whereas sad perceivers tend to attribute events to uncontrollable factors in the situation. The present findings indicate that these appraisal tendencies generalize to judgments of statement reliability. In addition, the distinction between witness and situational variables appears to be not only a useful classification tool (cf. Brewer et al., 2005), but

also a division that separates cues that are used differently when investigators infer reliability.

Basic social-psychological research has shown repeatedly that people tend to underestimate the impact of the situation when explaining others' behavior (Jones & Harris, 1967; Ross, 1977). An implication of the present research is that anger may exacerbate this tendency in various investigative judgments. First, as shown in Study IV, angry investigators may rely on their impression of the witness, thus disregarding aspects of the witnessing situation, when evaluating a witness statement. Needless to say, situational variables (e.g., lighting conditions, viewing distance) are often more predictive of reliability than witness variables, and the negligence of situational influences may thus produce grossly inaccurate judgments. A second possible consequence of emotion-related attribution differences relates to the ascription of potential motives to criminal suspects. Anger is known to increase attributions of blame and intent to people who cause negative events (Goldberg et al., 1999; Quigley & Tedeschi, 1996). The same mechanism may influence how an investigator construes the behaviors of a criminal offender. For instance, consider a homicide case where the victim was killed by an acquaintance in a bar fight. If the investigator is angry for whatever reason, he or she may ascribe more premeditation and criminal intent to the perpetrator than would be the case when in a neutral or sad emotional state. As a consequence, situational forces triggering the fight (e.g., provocation, threat) may be underestimated. Seeing that preconceptions and expectations about a case can influence the way criminal evidence is interpreted and valued, anger-induced tendencies to ascribe blame and intent may have far-reaching consequences throughout an investigation.

Limitations

The experiments with police officers as participants were conducted using relatively small samples. Hence, a limitation of these studies is the low statistical power to detect true effects. A closer look at the individual studies reveals that a number of effects approached significance, but did not fall below the conventional .05 criterion. Most likely, several of these would turn out significant if the statistical tests were performed on larger groups, considering the effect sizes. Importantly, the failure to observe some of the predicted effects in these experiments is perhaps best not attributed to an absence of real effects, but rather to the absence of sufficient statistical power. Recruiting large groups of participants is however a problem when studying any professional group. In the present research, data collection was possible on a few occasions in connection with advanced training courses for experienced criminal investigators. In order to retrieve data within reasonable periods of time, it was necessary to limit the number of participants in each experimental condition. The fact that some of the

findings were obtained using small samples raises the need for replication to establish the robustness of the results.

The design of Study IV contrasted the influence of anger and sadness without including a neutral control condition. Thus, it is not possible to conclude from the data whether it was sad or angry participants that differed from baseline. Sad participants may have behaved as they would in a neutral affective state, whereas angry participants made judgments differently than normal. On the other hand, the opposite may be true, or possibly, both sadness and anger may have altered participants' behavior. This issue is of great practical importance, because it determines when to expect effects of emotions in actual criminal investigations, and should thus be addressed in future research. The reason not to include a control condition in Study IV was twofold: First, the small sample of police officers available at the time forced us to minimize the number of conditions in our experiment. Otherwise, we would not be able to obtain reasonable statistical power to detect existing effects. Second, it was of sufficient theoretical interest in itself to compare anger and sadness, because these emotions are associated with appraisals that give rise to opposite predictions in several regards (Lerner & Keltner, 2000). Previous studies have compared pairs of emotions with fruitful results (Keltner et al., 1993; Lerner & Keltner, 2001; Tiedens & Linton, 2001), and we were interested in extending these findings to an investigative context. From this viewpoint, it was justified to exclude the control condition. Future studies on the topic should, however, seek to examine the applied implications of these findings further, by comparing the judgments of emotionally aroused participants against those of neutral controls.

Some of the explanations of the present research findings rest on assumptions about underlying mechanisms. For instance, angry and sad participants' differential reliance on witness and situational cues when assessing statement reliability was taken to reflect tendencies to attribute outcomes to either personal or situational causes. These tendencies were assumed to stem from the cognitive appraisals associated with the experience of anger and sadness. However, no direct evidence for the role of attributional tendencies was obtained. Thus, one cannot be certain that the hypothesized mechanism is responsible for the effect. An alternative account could be that the attributional effect is due to a difference in the depth of processing between angry and sad participants. Indeed, previous research has demonstrated that a reduction in the intensity of cognitive processing is accompanied by a reduced tendency to take into account situational causes in behavioral attributions (Gilbert et al., 1988). The relatively heuristic processing typically displayed by angry individuals may thus explain the failure to take situational conditions into consideration when determining reliability. It is an objective for future research to separate the relative contribution of attributional tendencies and processing strategies to the observed effect. Importantly, however, the fact remains that specific emotions

can influence cue utilization in reliability judgments, even if the exact mechanism has not yet been established.

A similar critique can be issued at the interpretation of the fact that participants in Studies II and IV were more critical in their evaluation of evidence that contradicted (vs. confirmed) the central hypothesis of an investigation. According to the quantity-of-processing principle (Ditto & Lopez, 1992), such asymmetrical skepticism occurs because people engage in more effortful processing when evaluating nonpreferred or unexpected (vs. preferred or expected) information, in an attempt to discredit the information or generate congenial interpretations. Although our findings are compatible with this account, we did not provide any measures of processing intensity in support of this. The possibility exists that participants chose to depreciate the inconsistent evidence simply by assigning lower ratings, without spending much effort on trying to come up with a rational justification. Although both strategies would produce similar judgments, it is theoretically important to establish the role of processing depth. For instance, if intense processing is involved, the asymmetrical skepticism would be expected to diminish under conditions where cognitive resources are limited. A straightforward way to test this in future studies would be to compare the magnitude of asymmetrical skepticism among investigators evaluating evidence under high and low cognitive load.

Finally, it was predicted that high-NFC participants in Study II would display a more pronounced asymmetrical-skepticism effect than their low-NFC counterparts. This prediction rested on prior research showing that people under a heightened NFC are more reluctant to abandon their prior belief in light of new information (Kruglanski et al., 1993), and more critical towards sources of inconsistent evidence (Kruglanski & Webster, 1991). The results gave no support for this hypothesis; instead a weak trend in the opposite direction was observed. In retrospect, the absence of asymmetrical skepticism among high-NFC participants can be explained in light of previous research on the effects of time pressure on human cognition (Svenson & Maule, 1993). This research has shown that time pressure generally causes people to engage in less systematic information processing overall, because of limits on time-consuming detailed analysis. Since the factors known to increase NFC (e.g., time pressure, unattractive tasks) make cognitive activity appear more costly to the individual, differences in quantity of processing may not be a likely consequence of directional goals stemming from closure goals. To fully establish whether or not the quantity-of-processing principle applies to investigative tasks performed under a heightened NFC, improved experimental designs that manipulate processing capacity and NFC independently are required. In this context, it is important to consider the time scale used to induce time pressure. In real-life investigations, time pressure is typically not a matter of minutes and seconds (as was the case in Study II), but rather of days and hours. Time pressure along the latter dimension arguably places less restriction on investigators' processing

capacity and their ability to engage in asymmetric skepticism. Hence, results from experiments with acute time constraints may underestimate the likelihood that the quantity-of-processing mechanism operates in actual criminal investigations.

Future Research

Theoretical Issues

Some of the identified limitations of the present research can be viewed as a more general critique of the motivated social cognition framework. For instance, the possibility that the sources of epistemic motives (e.g., time pressure) may sometimes counteract the effects predicted to follow from the very same motives (e.g., intensified cognitive processing) points to a lack of theoretical coherence within the MSC framework. In order to arrive at a more tenable theory, the following issues should be addressed by researchers in non-applied settings.

First, what are the boundary conditions for different mechanisms of motivated cognition? One conceivable possibility, consistent with the above discussion, is that conditions that place a limit on processing capacity (e.g., time pressure, information overload) counteract the influence of mechanisms that rely on intense cognitive elaboration (e.g., quantity of processing). Another possibility, as yet untested, is that the influence of a directional goal may be attenuated by other activated epistemic goals. For instance, it is unlikely that people completely abandon an accuracy goal with regard to an important task even when they have a preference for a particular conclusion. To illustrate, a scientist seeking to confirm his pet theory will probably be motivated to conduct sound and defensible empirical research. The relative strength of one epistemic goal to another may thus be an important moderator of motivated cognition, which should be a future issue of systematic experimentation.

Second, what causes the selection of a specific mechanism of motivated cognition in a given situation? Kruglanski (1996a) hints at an answer to this question by hypothesizing a number of criteria for choice among different mechanisms: The likelihood that a mechanism will be selected increases if it maximizes the probability of goal attainment, the immediacy of gratification, the permanence of the goal state, and the extent of goal fulfillment, and if it minimizes the required effort. Considered individually, each of the suggested criteria may successfully guide the choice between mechanisms. However, the existence of several possible criteria implies that a “meta-choice” has to be made, in order to select the most adequate choice criterion in a given situation (Kruglanski, 1996a). The question as to how such meta-choices are executed is as yet unanswered.

Applied Issues

A number of predictions regarding the mechanisms of motivated cognition (e.g., biased memory search, theory construction), emotion-specific influences (e.g., guilt attribution), and moderating factors (e.g., “elasticity” of evidence) remain to be tested in an investigative setting. In addition, the original research presented in this thesis was carried out using relatively small samples and a uniform vignette paradigm, which calls for replications in order to establish the generality of the findings. Most notably, some aspects of the organization of investigative work were intentionally disregarded in the design of the present research. For instance, whereas the present studies focused on judgments made by single individuals, investigations of serious crimes are typically carried out by investigative teams consisting of individuals with different levels and areas of expertise (O’Brien, 1995). On one hand, this diversity may place limits on the influence that subjective factors exert on the performance of investigative tasks; biased decisions should arguably be less likely to win approval by a number of independent individuals than by a single investigator. On the other hand, several known group-psychological processes (e.g., group polarization, groupthink; Parks & Sanna, 1999) may serve to perpetuate or even exacerbate the biases that stem from the mind of a single investigator. Whatever the outcome, empirical tests of the hypothesized mechanisms in team-based investigative work would be highly informative as to the external validity of the present findings.

A further objective for future research should be not only to look at the causes and consequences of biases in criminal investigations, but to also search for debiasing strategies. An intuitively plausible possibility is that more resources allocated to the law-enforcement system will improve the quality of policing activities. However, research indicates that this is not an effective means to come to terms with the inadequacies of criminal investigations (Bayley, 1994; Burrows & Tarling, 1987; Greenwood et al., 1977). In order to effectuate only a slight increase in clear-up rates, vast amounts of money need to be infused into the police organization. Instead, more efficient methods might be developed if knowledge from the field of judgment and decision-making be consulted. The question of how to overcome imperfections in the reasoning of human decision-makers is the focus of numerous studies (e.g., Fischhoff, 1982; Hirt & Markman, 1995; Kray & Galinsky, 2003; Sanna & Schwarz, 2003). Hence, in the same way that the present research uses theoretical frameworks to predict potential pitfalls in the work of criminal investigators, prospective safeguards against the very same hazards may be inferred from other domains of psychological theory.

One safeguard that seems particularly promising is to introduce stricter requirements for the documentation of investigative activities. This would entail making investigators record not only the information perceived as most relevant to an investigation, but also less obviously related details. Such documentation could include providing rationales for different actions taken. For example, the decision to call one of several witnesses for a second interview should be

supported by reasons why this second interview was essential to the investigation, and why only that particular witness was chosen. In addition, extended documentation could include an outline of the investigators' reasoning process. For instance, why was the evidence taken to imply a particular suspect, and what alternative hypotheses were considered when searching for and evaluating the evidence? The potential success of this method rests on two psychological mechanisms. First, stricter requirements for documentation is likely to increase investigators' perception of accountability, because their actions may later become subject to critical examination. Accountability, in turn, has the potential to increase people's accuracy motivation (Lerner & Tetlock, 1999; Tetlock, 1992). Hence, investigators required to document and justify their reasoning and actions may try harder to avoid bias and make more thorough and balanced analyses of the investigated crimes. Supportive of this assumption, previous research has found accountability to be an effective deterrent of a number of cognitive biases (Sedikides et al., 2002). Second, the act of detailing thoughts and reasons forces investigators to consider alternative explanations for the obtained evidence. Merely considering alternative accounts of the same base of evidence has been found to decrease people's confidence in a focal hypothesis (Anderson & Sechler, 1986; Koehler, 1991; Lord, Lepper, & Preston, 1984). Thus, the documentation procedure may attenuate confirmation bias by reducing the focus on a single hypothesis, and by raising the need to falsify alternative hypotheses in addition to confirming existing beliefs and expectations. An obvious drawback to increased documentation requirements is that criminal investigators are presented with yet another task. Given an already burdening workload, such a task may be seen as overly demanding. However, the benefits may well outweigh the costs. In addition to reducing bias, an enhanced documentation procedure may serve as a useful tool in investigators' day-to-day work. That is, the resulting documents become an external and structured representation of a case, which may aid judgments and decisions made with regard to a complex and large information base.

Normative Considerations

Any discussion on subjective influences on judgments would not be complete without an evaluation of the desirability of the phenomena. To make such an appraisal, one first needs to ponder whether or not the tendencies to make different judgments depending on one's current expectations, motivation, emotional state, and outcome knowledge are to be considered irrational. The answer lies in one's definition of what is rational in a legal setting. Indeed, it is fully compatible with the rules of logic to ascribe higher likelihood of guilt to a person the more incriminating evidence there is. Claiming otherwise would be quite indefensible, and merely demonstrating this tendency through scientific studies would be rather trivial. However, the focus of the research in this thesis

is quite different. The results show that a given piece of information (e.g., witnessing conditions, crime-scene observations) receives different evaluations as a function of the investigator's mental state. That is, although the information is identical, it is appraised differently by individuals varying on dimensions unrelated to the target of the judgment, such as emotion and motivation. If two persons ascribe differing qualities (e.g., good vs. bad) to the same objective fact, then both cannot be right, according to basic logical principles. Accordingly, I argue that the observed phenomena are in fact to be regarded as biases; that is, systematic deviations from rational standards. This provided, the question remains as to how detrimental these biases are to the legal system. In everyday life, the use of heuristics and biases cannot easily be dismissed as undesirable. In fact, most human thinking tendencies probably exist for some functional reason, or they would not have developed in the first place. Many of them help people adapt to the complex nature of the external environment and social life (Gigerenzer et al., 1999). However, legal reasoning differs from everyday thinking in the sense that it entails more serious consequences and requires greater accuracy. It is not merely the judge's own personal well-being that is at stake, but the future of plaintiffs, defendants, their friends and relatives, and the society at large. In addition, the principles and rules that govern the carrying out of investigations and legal proceedings make it clear that all judgments and decisions are to be based on an objective assessment of facts. Hence, the influence of subjective factors specific to the person making the judgments should be kept to a minimum. From this viewpoint, it is clear that any display of cognitive biases is undesirable in a legal context.

Conclusion

The field of psychology and law has been criticized of being a mainly phenomenon-driven enterprise (e.g., Lloyd-Bostock, 2000; Ogloff, 2002). That is, the starting point for most research has been specific components of the judicial process seen as particularly problematic, such as inadequate interrogation techniques, unreliable identification-lineup procedures, and so forth. Such studies can be characterized as "reactive" research, since it is conducted as a direct response to criticism regarding flaws in the judicial system. Research conducted from this perspective often suffers from a lack of theoretical foundations because psychological theory is brought to bear on the phenomena in an ad-hoc fashion, rather than used for a-priori predictions. The present research, in contrast, adopts established theoretical frameworks as its starting point, and derives predictions to be tested in the scantily researched area of investigative psychology. The deduction of potential hazards in the judicial system from existing theory represents a "proactive" approach, which aims at identifying and remedying potential weaknesses through the use of psychological theory. The main findings of these studies parallel those previously obtained in

non-applied settings. The application of theoretical principles established within basic psychological research thus seems like a promising path for future research on the criminal investigation process.

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APPENDIX

- I. Ask, K., & Granhag, P. A. (2005). Motivational sources of confirmation bias in criminal investigations: The need for cognitive closure. *Journal of Investigative Psychology and Offender Profiling*, 2, 43-63.
- II. Ask, K., & Granhag, P. A. (in press). Motivational bias in criminal investigators' judgments of witness reliability. *Journal of Applied Social Psychology*.
- III. Ask, K., & Granhag, P. A. (2006). *Perception of lineup suggestiveness as a function of identification outcome*. Manuscript submitted for publication.
- IV. Ask, K., & Granhag, P. A. (2006). *Hot cognition in investigative judgments: The differential influence of anger and sadness*. Manuscript submitted for publication.