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# Can Intuitive Decision Making Improve Homeland Security?

## Project Leads

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## Statement of Problem

Judgmental processes involved in risk perception and decision making have traditionally been conceptualized as cognitive in nature, being based upon a rational and deliberate evaluation of the situation at hand. Conversely, a sampling of research from diverse literatures suggests that intuitive decision-making may offer an alternative (or possibly complementary) behavioral strategy in some situations. Historically, psychologists have been reluctant to acknowledge intuition as a viable construct, often consigning it to the fringes of the field of psychology, in part because of the numerous articles in the popular press extolling the virtues of “gut instincts” and “hunches.” Several recent scholarly reviews, however, suggest that the concept of intuition has begun to emerge as a legitimate subject of scientific inquiry, and one that may have important ramifications for educational, personal, medical, and organizational decision-making; personnel selection and assessment; team dynamics; training; and organizational development.

Some evidence suggests that individuals are likely to rely on intuitive thought processes when they face extreme time pressures or are confronted with novel or unexpected situations. Consequently, intuition may play a significant role, for example, in the decisions of firefighters, military commanders, emergency room surgeons, and corporate executives operating under severe time constraints. Similarly, a variety of different occupations within the U.S. Department

of Homeland Security (DHS) require job incumbents to confront situations that are both novel and time-sensitive (often routinely), suggesting the likely benefits of research on intuitive decision-making and application directed at jobs such as intelligence analysts, border patrol agents, airport screeners, and first responders.

Reflecting on the notion of threat assessment, O'Connor (2009) recently reiterated the importance of including a human component within information systems so that agents can detect and report "pre-incident indicators," or intuitions. He suggested that such intuitive knowing comes from situational cues as well as from past experiences or memories. Thus, intuition may be particularly useful in detecting threats or events that currently fail to meet some cognitive threshold but that may become more obvious and detrimental threats in the future. The purpose of this brief, therefore, is to critically evaluate the current state of scientific knowledge with regard to intuitive decision-making with a view to refining the way in which the construct might be operationalized in future work and gaining a better understanding of how intuition may best be developed, assessed, and applied within DHS.

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## Background

Intuition has long been discussed across a variety of academic disciplines, especially the business management and medical domains. While some of this literature is empirical, the majority can be characterized as expository or theoretical. Because of its general appeal, the subject has also been regularly discussed in the popular press. For example, several years ago, Malcolm Gladwell wrote a popular book entitled *Blink* (2005) about intuition, citing dozens of examples of real people using intuition to make decisions that retrospectively proved to be more accurate than decisions arrived at purely through rational analysis. While this and other such items in the popular press have drawn attention to the topic and resonate well with the consuming public, they do little to advance the state of the science of intuitive decision-making or its strategic application to homeland security.

### ***Which Type of Decision Making Is Superior?***

In fact, there is substantial disagreement in the literature about whether intuitive judgments lead to effective decision-making and whether they are more or less effective than rational decisional making. For example, Agor (1986) suggested that those skilled in the use of intuition tend to have particular decision-making skills not normally possessed by others and that they are particularly adept at generating new ideas and providing ingenious new solutions to old problems, especially in rapidly changing environments or crisis settings. Behling and Eckel (1991) noted that "*analyze everything*" has been the mantra of traditional decision-making theorists, but they argued that rational analysis is over-emphasized. And although intuition holds considerable promise, it is often conceptualized in different ways by different authors. Dijksterhuis (2004) conducted a series of laboratory experiments on conscious and

unconscious thought in a complex decision-making situation and found that unconscious thought was superior to conscious thought in these situations; he also noted that while conscious thinkers reported that their decisions were often based on a few specific relevant attributes, unconscious thinkers formed a more global judgment based on much more information. In addition, Gigerenzer and Brighton (2009), in a review of the decision heuristics literature and through a series of analytical demonstrations, suggested that in certain situations less information, computation, and time can in fact improve the accuracy of decision making. They argued that “fast and frugal heuristics” can produce adaptive decisions in a variety of real-world situations.

Conversely, Kahneman, Tversky, and others have argued for a number of years that intuition involves the use of these heuristics, or mental shortcuts, which may lead to flawed decision-making (Kahneman, 2003; Kahneman, Slovic, & Tversky, 1982). The scientific underpinnings of this perspective are based on the earlier work of Paul Meehl (e.g., Dawes, Faust, & Meehl, 1989; Grove, Zald, Lebow, Snitz, & Nelson, 2000; Meehl, 1954), who argued that human judges are more fallible than simple statistical models when comparing forecasting accuracy. Similarly, Miller and Ireland (2005) noted that although a recent survey of executives revealed that almost half use intuition more than formal analysis to run their companies, their own examination of the literature found that intuition was not a particularly effective decision-making strategy. In particular, they suggested that intuition has been overused because of the mystery and allure surrounding the concept and because it offers a method of speeding up the decision-making process. Instead, they cautioned that intuitive decision-making should be used in a very limited set of circumstances (e.g., when time/resource constraints prevent more thorough analysis). Berragan (1998) suggested that the subjective practice of intuition does not fit into the paradigm of evidence-based health care practice (which should be predictable, measurable, and generalizable), and thus, intuition should be viewed as a cognitive “short-circuiting,” where a decision is reached even though the reasons for the decision cannot be easily described.

Other authors have suggested that both processing modes can contribute to effective decision-making. For example, Shapiro and Spence (1997) proposed that problems lie on a continuum of structuredness. Unstructured problems are conducive to intuition because of the absence of well-accepted decision rules for dealing with such situations. For this reason, intuitive judgments are said to become more effective relative to rational analysis as a problem becomes increasingly unstructured. Sadler-Smith and Shefy (2004) added that where decisions do have to be made speedily and with cognitive economy in the face of an overwhelming mass of information or tight deadlines, executives may have no choice but to rely upon intelligent intuitive judgments rather than on non-existent or not-yet-invented cognitive routines. Consequently, they concluded that intuition is as important as rational analysis in many decision processes, and bias is just as likely to be present in intuitive decisions as in any other types of decision processes.

Similarly, Shirley and Langan-Fox (1996) argued for the use of intuition in decision-making—especially when uncertainty is high, variables are less predictable, facts are limited, and little precedent exists. Interestingly, although many of the DHS target jobs mentioned (e.g., border patrol agent, intelligence analyst, security screener, first responder) seek to be regimented, structured, and rigorous in their approach to observation and data collection, much of their focus is, in reality, on reacting effectively and efficiently to sudden, unexpected events. In sum, while much early literature suggests that use of intuition in decision making is inferior to more rational models, a growing body of literature suggests that, under appropriate conditions, intuition may be as good as, or even superior to, other decision-making approaches. Still, much disagreement exists, as noted in a recent article by proponents of these divergent perspectives (Kahneman & Klein, 2009).

### ***Dual Processing Perspective***

While there remains considerable dissent about the conceptual boundaries and practical worth of intuitive decision-making, most researchers agree that intuition arises through unconscious operations, draws on our ability to synthesize information quickly, and may be hindered by more formalized procedures (Dane & Pratt, 2007). Much of the research incorporating intuition into models of decision making endorse a dual-process model of decision making in human beings, believing that such models offer a more integrated and coherent account of the nature and role of intuition. These models assume that there are two distinct modes of operation of mental processes: System 1 is autonomic, experiential, tacit, automatic, natural, and associative. System 2 is intentional, rule-based, analytic, and explicit in nature (Hodgkinson, Langan-Fox, & Sadler-Smith, 2008). Intuitive decision-making is found within the first; rational decision-making within the second. Recently, Price and Norman (2008) extended this perspective, arguing that intuition may be neither entirely conscious nor entirely unconscious. Rather, they drew on the concept of fringe consciousness (Mangan, 2003), suggesting that such a perspective may more accurately bridge the dichotomy between intuition and deliberation than is assumed by dual-process models.

### ***Domain Knowledge***

As noted earlier, Tversky and Kahneman (1971, 1974) have stressed that intuition involves the use of *heuristics*, which reduce the complex tasks of problem solving to simpler judgmental operations. From their perspective, when presented with a problem, individuals can use heuristics to help focus attention on critical information, suggest linkages among stimuli, and decide on a right answer or best course of action. Research within this domain has shown that while heuristics are often useful for quickly assessing probabilities and making decisions in uncertain situations, they may not be particularly accurate, in part because reliance on such “rules of thumb” may be inadequate to process complex environmental stimuli. In other words, when simple heuristics are applied haphazardly and unreliably to a wide array of problem domains, the result is a reduction in the effectiveness of intuitive decision-making.

A growing body of research argues that experts in a field can make highly accurate intuitive decisions. For example, Dreyfus and Dreyfus (1980), Benner (1982), and Pyles and Stern (1983) suggested through research that intuition is developed over time as a practitioner becomes more experienced; thus, individuals who want to form complex, domain-relevant schemas must engage in repetitive practice over a long period of time. Similarly, Houlston (2008) believes that analytical models of decision making are more likely to be used by the novice nurse (who may possess a limited clinical framework on which to base judgment and decisions), whereas the decision-making of experienced nurses involves both rational decision-making and experience-based intuitive insights. Klein and associates (see, for example, Phillips, Klein, & Sieck, 2004) introduced the notion of naturalistic decision-making, whereby tactical thinking skills used by experts in situations where time is critical and rapid decisions must be made, can be identified, modeled, and possibly trained.

In sum, then, one of the primary differences between heuristic-based intuition and expert intuitive decision-making is the existence and accumulation of domain knowledge. While some researchers have emphasized heuristics and heuristic biases that affect most individuals, regardless of their domain knowledge, others have focused more exclusively on the value of intuitive decision-making that can result from expert knowledge of specific domains. It would be worthwhile to conduct a closer examination of how various degrees of domain knowledge, ranging from simple heuristics to sophisticated “expert” schemas, may influence the effectiveness of intuition as a decision-making approach in a given domain.

For example, some scholars are beginning to examine differences in how such knowledge structures are developed—by means of *explicit* or *implicit* learning. While explicit learning (actively seeking out the structure of the information) associated with expert knowledge may lead to far more advanced and effective intuitive decision-making in some situations, such extensive expert knowledge may not always be necessary for the formation of complex, domain-relevant schemas. Instead, Dane and Pratt (2007) suggest that schemas may develop through implicit learning, that is, the acquisition of knowledge outside of one’s conscious awareness. Similarly, Reber (1989) tied implicit learning to “intuitive knowledge” and argued that it is through implicit learning that individuals come to form the complex cognitive structures necessary for intuitive judgments and decisions.

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## Synthesis

Recently, Dane and Pratt (2007) attempted to provide some clarifying structure to this field of inquiry by defining intuition as affectively charged judgments that arise through rapid, unconscious, and holistic associations. They contrasted this with rational decision-making, which they characterized as having a consistently deliberative process of applying systematic procedures designed to assess pertinent information, evaluate costs and benefits, and arrive at a logical decision. While Dane and Pratt have done a good job of summarizing the principle

components of intuition, considerable disagreement remains within the literature concerning what intuition is and what it does. In addition, scholars often fail to distinguish between when intuitions are used and when they are used *effectively*. As our review suggests, a closer look at the role that domain knowledge plays in the effectiveness of intuition as a decision-making approach would prove worthwhile. While the available research implies that an in-depth study of intuition may hold great promise, there are potential challenges and barriers—both theoretical and practical—yet to be encountered and solved, whether it be a challenge such as understanding the transferability of intuitive skills across occupations or even skill levels or the adoption of such intuitive techniques as useful tools in organizations characterized by highly structured and routinized operational procedures.

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## Future Directions

Because of the considerable variability in how intuition is defined and applied, one component of any research endeavor would be to seek out sources of conceptual agreement or overlap across different disciplines and, thus, provide greater clarity about the concept of intuition. It will be important to better understand those conditions that *foster the effective use of intuition* to complement existing work on when intuition is most likely to be used. For example, how does intuition differ from guesses, insights, hunches, or instincts? In addition, some researchers (e.g., Agor, 1986; Shirley & Langan-Fox, 1996) have proposed that intuition may have an affective component, thus offering another distinguishing characteristic from more rational decision-making processes and offering a possible additional avenue of investigation. Future research efforts, therefore, need to investigate whether an intuition construct can be isolated and measured. It will also be important to determine whether it can be used as one basis for hiring and whether it can be learned, and therefore trained? Future research should also examine intuitive decision-making's usefulness as both an alternative decision-making strategy and as a strategy that supports a rational decision-making approach—and differentiate under which conditions each might be most effective.

If intuition is found to be a relatively stable trait that individuals possess to differing degrees, then that conclusion leads to a workable strategy for human resource managers to emphasize recruiting and selecting intuitive decision-makers and placing them in key DHS jobs most in need of those talents. If, as a number of authors have suggested, intuitive decision-making is a skill that can be improved through training, then it will be important to determine the most effective training strategies for enhancing those skills. How, for instance, might intuition be developed for different types of employees; what kinds of training or assessment environments would need to be instituted? Interestingly, some authors have proposed particular training approaches for intuition (e.g., Agor, 1986; Brockmann & Anthony, 1998; Sadler-Smith & Shefy, 2007), but these generally involve somewhat esoteric techniques such as visual imagery, relaxation techniques, and analytical exercises—essentially intuitive

awareness training—and their applicability and practicality would need to be more thoroughly explored.

In general, then, the literature suggests that there may be substantial promise in the application of intuitive decision-making strategies for homeland security. However, much additional work—with both a basic and applied research focus—is required to critically evaluate the current state of scientific knowledge with regard to intuitive processing, including refining the way in which the construct might be operationalized in future work and gaining a better understanding of how intuition may best be developed and applied within DHS.

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