

The intuitive executive: Understanding and applying 'gut feel' in decision-making

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Executive Overview

Even though the conditions under which executives operate may sometimes limit or even preclude the use of rational analysis, it is nevertheless the norm in many organizational decision processes. Intuition, on the other hand, is often considered to be the antithesis of this approach and is usually overlooked or disregarded in decision-making. However, in recent years there has been resurgence of interest in intuition, perhaps because of some dissatisfaction with rationality and its limits and also because some psychologists are now arguing that much of cognition occurs automatically outside of consciousness and in the realm of intuition.

Knowledge of intuition has made significant advances in recent years, and it can now be understood as a composite phenomenon involving interplay between knowing (intuition-as-expertise) and sensing (intuition-as-feeling). Furthermore, rather than being set in opposition to each other, intuition and rational analysis are better conceived of as two parallel systems of knowing. Against this backdrop we consider the significance of the two facets of intuition for executive decision-making processes. From this integrated perspective we offer some guidelines whereby executives can make more effective and intelligent use of intuition in ways that acknowledge its limitations while maximizing its potential in enhancing firm success in complex and fast-moving business environments.

Balancing Intuition and Rationality

Executive intuition is the skill of focusing on those potentially important but sometimes faint signals that fuel imagination, creativity, and innovation and feed corporate success in globally competitive business environments. A former vice president of the leading cosmetic MNC L'Oreal is quoted as saying that decision-making intelligence requires a fine balancing of two seemingly contradictory capabilities: intuition and rationality. The first one allows executives to pick up on important but weak signals; the second enables executives to act on them. The CEO of the same company sees the challenge for executives as a matter of imagination and intuition in equal parts: "It is intuition [when one asks] 'What do these brands have that just might seduce the world?' But also in terms of imagination, [one asks] 'What could they become to seduce the world?'"¹

We are only too well aware that businesses are

often contradictory, ambiguous, and surprising places, and that their environments are becoming increasingly complex and unpredictable. Together these factors make fragmented and multiple demands upon executives. Fast, high-quality, strategic decision-making in this context represents a fundamental dynamic capability in high-performing organizations. The traditional response to this challenge has been rational analysis: information is collected, collated, analyzed and interpreted, alternatives are formulated, and a logical choice is consciously arrived at.² However, in modern business environments, a number of factors can affect the efficacy of an exclusively rational process. Strategies and tactics can be thrown off course by factors ranging from wars, global terrorism, and new diseases to more mundane everyday matters such as computer glitches and minor accounting foul-ups. Technological advancement and developments in organizational systems and processes have contributed to an explosion in the volume of

data that executives may be required to deal with. The volume and complexity of available information has the potential to be overwhelming. The CEO of a major energy corporation recently made this point quite succinctly:

Ignoring them [intuitions] has led to some bad decisions...you have to *learn to trust* your intuition. Otherwise, at the point when you've gathered enough data to be 99.99 per cent certain that the decision you're about to make is the correct one, that decision has become obsolete.³

On the other hand, individuals and firms are often exhorted to undertake new venturing opportunities in novel and unfamiliar environments where, for them, there may be an information vacuum.

The requirement for fast decisions and the limits of human beings' rational information-processing capacities may combine to impose severe demands upon executives' cognitive capabilities to handle masses of information at the necessary speed. This may result in a combination of volume-induced and/or complexity-induced information overload that may limit or even preclude in-depth and deliberate consideration and balancing of alternative courses of action.⁴ Even when working in overloaded, uncertain, and fast-moving conditions, rationality is seen as indispensable in many strategic management decision processes. Moreover, as far as the education and training of executives go, rationality is, with a few exceptions, still the norm in the business and management school curriculum.

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Intuition is a capacity for attaining direct knowledge or understanding without the apparent intrusion of rational thought or logical inference. Our fundamental precept in the context of executive decision-making is twofold: firstly, intuition is as important as rational analysis in many decision processes; secondly, there are ways in which executives can improve their intuitive knowledge, understanding, and skill.

In this article, we aim to review and synthesize relevant theory and research in order to suggest how executives may be able to better focus upon ways in which intuition may affect their personal decision-making behaviors and upon ways in

which they might use intuition more intelligently. Drawing upon extant theory and research, we present an integrated and up-to-date account that identifies two principal facets of intuition and which explores their relevance for executive decision-making behaviors. Recommendations for how executives can put this knowledge into action in order to enhance their decision-making follow each section. These guidelines are also summarized later in Table 1.

Rationality and Decision-Making

Being rational entails the acquisition of knowledge through the power of conscious reasoning and deliberative analytical thought. The pre-eminence of the rational paradigm in management is often justified by the assumptions that executives are inherently rational decision-makers who seek to maximize outcomes in a world where business environments are considered objective entities and successful strategies are the product of deliberate planning.⁵ In practice this means: the more information, the better; 'cool and calm' strategic thinking should not be debased by feelings; efficient thought and behavior must be called upon to subjugate emotion; and good organizations manage employees' feelings or design them out of the process.⁶ Sticking rigidly to such a position raises a number of problems.

For example, being exclusively rational requires some measure of agreement about goals since these will determine what information should be collected and how it should be analyzed. Agreement about cause-and-effect relationships is similarly important since this will inform plans and predictions about future actions and their outcomes. There is an inherent assumption that knowledge is recognizable and valuable only when it is explicit, untainted by feelings, and open to conscious thought and introspection. Against this rational backdrop, the significance of unconscious mental processes and feelings should not be underestimated or overlooked since they can be a source of intuitively based judgments that may provide an alternative to consciously derived rational choices.

An important issue at the root of debates about the utility of rationality is the role of uncertainty and the availability of information upon which executives may base their decisions. The relationship between decision-making and uncertainty has been interpreted and explained in a number of different ways. For example, some have argued that uncertainty increases the degree of procedural rationality that is required in order that in-

formation gaps can be filled and uncertainty may be removed by further analyses.⁷ Some studies suggest that rational decision-making does have situational superiority under particular sets of circumstances.⁸ Other research has revealed a negative relationship between uncertainty (the extent to which the problem is similar to others that have been dealt with in the past) and rationality (the extent to which information search, analysis, and use of quantitative techniques contribute to a decision choice).⁹ The rational method can undeniably lead to effective decisions.¹⁰ However, when outcomes are difficult to predict through rational means, executives need to acknowledge the uncertainties, be more tolerant of ambiguities, be able to respond to complexities in pragmatic, intelligent and fast ways in the face of the unknown, and recognize the potential that their intuitive judgments may offer. Moreover, where decisions do have to be taken 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 routines.

When deliberative rational thought is not achievable or desirable (for example, where unambiguous or sufficient 'hard' data is not immediately at hand, might never be available at all, or where creative solutions to problems are needed), one way of managing and coping with uncertainty and complexity and of 'thinking outside of the box' is by relying upon intuition. As an outcome of an unconscious process in which there is little or no apparent intrusion of deliberative rational thought, intuitions can be considered 'soft data' that may be treated as testable hypotheses ("Do the facts and figures back up my intuition?") or used to check out a rationally derived choice ("How do I feel about the decision I've made?"). In this respect, a carefully crafted intuitive knowledge, understanding, and skill may endow executives with the capacity for insight, speed of response, and the capability to solve problems and make decisions in more satisfying and creative ways.

There are those who offer the view that *affect is data*, albeit of a rather special kind¹¹ but with the important caveat that unconscious mental processes and affect should not be treated as directives, but neither should they be ignored or dismissed as irrelevant. There are also those who argue that it is not possible to make effective decisions *without* using intuition. We prefer to argue that executives need to be able to recognize and understand intuition, accept it, establish ways in which they can be comfortable with it, and lever-

age its potential for success and well-being both for themselves and for those whom they lead. This knowledge, understanding, and skill constitute an intuitive awareness, and in our view the question of how this may be developed is important both for executives themselves and for those educators and consultants whose aim it is to improve executives' decision-making skills. This is especially important given that management education and training in general appear to be lacking in this regard (there are of course notable exceptions). Research-based knowledge allied to our own experiences in training and developing executives' intuitive skills leads us to the view that executives can begin to understand and craft their individual intuitive decision-making capabilities by following some fairly straightforward guidelines.

Intuition and Management

The subject of intuition has figured in philosophy, psychology, and the social and natural sciences over the ages from Aristotle and Ovid, through Spinoza, Michael Faraday, and William James, to the 20th century where Henri Bergson, Carl Jung, Bertrand Russell, Jonas Salk, and Albert Einstein all attested to the value of intuition as a unique way of knowing. Intuition in management was discussed explicitly as far back as Chester Barnard's *Functions of the Executive* in 1938, but over the intervening decades, despite occasional bouts of rhetoric, it has (with a few exceptions) tended to be downplayed or overlooked. However, in recent years there has been something of a resurgence of interest in intuition among academics and practitioners, perhaps because of a dissatisfaction with rationality and its limits,¹² perhaps because it resonates with the more holistic and spiritual *Zeitgeist* of the late 20th and early 21st centuries, and also because some psychologists are now arguing that much, if not most, of cognition occurs automatically outside of consciousness.¹³

Intuition is difficult to describe but easy to recognize. Many of us will be intimately familiar with our own intuitions and will probably be able to identify, and may even envy or admire, those individuals who confidently display a 'gut feel' for complex situations and who appear to have an 'instinct' for grasping key issues quickly. They can often instantaneously recognize in a highly convincing manner whether an investment is likely to turn sour, whether a potential hire is good or bad, whether a new product will make it or not; but frustratingly they may find it difficult to articulate the reasons behind these decisions which may just 'feel right.'

Do Executives Use Intuition?

If one accepts, firstly, that rationality has limits (to the extent that it may not be applicable exclusively in certain situations), and secondly that intuition is a naturalistic phenomenon to which human beings are subject, the question then is raised as to whether or not executives use intuition when making decisions. A moment's introspection may reveal that even if we do not see ourselves as naturally intuitive decision-makers, we may be the reluctant recipients of our own intuitions because of their pervasiveness and involuntary nature. Intuitions are not arrived at through an effort of will. If it is inevitable that executives will experience intuition, we may then ask just when and how they use it.

When do executives use intuition?

Research suggests that executives do make significant use of intuition. For example, in an international study, Parikh and his colleagues asked managers to indicate from a list of functional areas of decision-making those in which they thought intuition has a role to play.¹⁴ A majority of respondents felt that intuition was significant for decisions in corporate strategy and planning, marketing, human resource development, research and development, public relations, investments and acquisitions, and mergers and alliances. A minority of respondents felt that intuition has a role to play in decisions relating to capital expenditure, finance, and production and operations management.

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An overwhelming majority felt that many senior managers use intuition to some extent in making decisions, that it can contribute to greater success, and that it should form part of the management education and development curriculum. Other interview-based research in the USA suggests that intuitive decisions are most frequently viewed by executives themselves as being based upon experience (expertise that has been built up, is held in a mental map or schema, and influences conscious thought and behavior but not always by any apparent deliberative rational means) and feelings (where affect in the form of a gut feeling can exert a quite compelling influence upon decision choices).¹⁵

How do executives use intuition?

Isenberg identified a number of ways in which executives use intuition: sensing a problem; performing pre-programmed behavior patterns; producing an integrated picture; as a check on rational analysis; and as a way to by-pass analysis.¹⁶ Arguably, therefore, becoming a more effective decision-maker is about learning to make sense of intuition, judging when to trust it, and feeling confident enough through practice to use it. For example, a director of a global consultancy firm said:

Intuition presents the possibility of turning ideas into action and speeding up decision-making. I would not like to see managers consciously squashing their intuition. I would much rather they went around saying "I think we should do this because I *feel* it might work."¹⁷

Hayashi argued that a 'business instinct' (intuition) is an important factor in singling out successful performers and that intuition is needed increasingly as people climb the corporate ladder. He cited the views of a senior executive of one of the world's largest pharmaceutical companies:

Very often people will do a brilliant job up through the middle-management levels where it's heavily quantitative, in terms of the decision-making. But then they reach senior management, where the problems get more complex and ambiguous, and we discover that their judgment or intuition is not what it should be. And when that happens, it's a big problem.¹⁸

It is not only high fliers in major corporations who have testified to the value of intuition; there is a long tradition of systematic research into the role of intuition in clinical practice in health and related fields, particularly in relation to the differences between experts and novices. In educational management, a study of the intuitive experiences among a sample of college principals found that they all experienced intuition-as-feelings which surfaced early on during complex decision-making and was combined with rational analysis at some point in the process.¹⁹

In addition to the case study-based and anecdotal accounts, there have been quantitatively based empirical studies of management intuition which suggest that: senior managers are likely to be more intuitive than their middle and junior counterparts; small business entrepreneurs are as

intuitive as senior managers in large firms; and executives in high-growth small businesses are likely to be more intuitive than their lower-growth counterparts. Studies of executive thinking using cognitive mapping techniques revealed that many senior managers traded depth of information for a breadth that took in the whole view and in which they used narratives and symbols in the forms of personal experiences in rationalizing their intuitive decisions.²⁰

The *Myers Briggs Type Indicator (MBTI)* is a questionnaire that can be used to assess the extent to which (among other things) people make sense of their perceptions of the world through intuition. A long tradition of management research using the *MBTI*²¹ has concluded that intuitive managers are more likely than other types to favor more abstract information and perceptual processes, be inclined toward idealistic, unconventional, and creative behaviors, and engage in strategic planning activities more frequently and effectively. Intuitive types tend also to feel self-sufficient and trusting of their own judgment, able to live with ambiguities and uncertainties,²² and also be confident in the information they have at hand (paradoxically, too much information can lead to decreased decision performance but increased feelings of satisfaction²³).

Intuition in Organizations

Research suggests that the proportion of executives with an intuitive preference is likely to increase with seniority. This is explainable in at least two ways. Intuitive skills (such as holistic and visionary thinking) may help some executives to attain senior positions; hence, intuitive types may thus become disproportionately represented at higher levels in organizations. Alternatively, top executives' job responsibilities may demand that they hone their existing intuitive capabilities more fully than managers lower down the hierarchy. From a career development and human resource planning perspective, it is important that executives have the opportunity to develop the necessary decision skills and cognitive strategies (including those that are intuitively based) to fit the demands of their current or future job roles.

Organizational power may also play an important part in shaping the extent to which intuition is used and 'owned up' to. For example, seniority may legitimize the use of intuitive approaches by groups such as managers and executives while employees lower down the hierarchy, even though they may be subject to their own intuitions, may feel the need to legitimize their decisions by rationalizing through collecting 'hard data' and analyz-

ing it. Moreover, employees at all levels may not be predisposed to openly admitting to colleagues, superiors, or subordinates that they might be basing their actions on their gut feelings. Hence one might speculate on how widespread 'closet intuition' is.

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The extent to which intuition is used in decision-making may also be influenced by external stakeholders, depending upon their level of influence. Where this is high, they may explicitly or implicitly insist upon rational procedures in support of decisions. Finally, executives themselves may be required to display rationality to convince or impress those who exercise power over them (or those whom they manage) of the legitimacy of their actions.

Recommendation 1: Open up the closet

As a psychological process, intuition is automatic and involuntary. Research also suggests that intuition as an organizational process is widespread across a number of important functional areas of management. Against this background, the working environment of executives can support or suppress this automatic and involuntary process through socio-cultural factors which may lead, for example, to general conformance to a rational paradigm (for example, by 'group-think') and collective forms of cognitive inertia (such as 'grooved thinking'²⁴). The concomitant danger is that if intuition is continually suppressed, it may cease to operate²⁵ or may be driven underground. Executives may then come to rely upon it privately and covertly with a potentially detrimental effect upon individual and collective learning. The following questions may help you to gauge the extent to which you rely upon intuition in your decision-making.

Do you *trust* your hunches when confronted by an important decision?

Do you *feel in your body* if a decision is right or wrong?

Do you put a lot of *faith* in your initial feelings about people and situations?

Do you put more emphasis on *feelings* than data when you make a decision?

Do you rely on your *gut feelings* when dealing with people?

Do you trust your experience when arriving at

the reasons for making a decision even if you can't explain why?

Does your intuition often turn out to have been *right* all along?

What is (or would be) the reaction in your organization to decisions made on the basis that they *felt* right?

Do you keep your intuitions *close to your chest*? If so, *why*?²⁶

Defining Intuition

Intuition is often depicted in a variety of ways, sometimes with connotations of mystery and the paranormal. At other times it may be confused with biological and cognitive processes such as instinct and insight. The root of the term 'intuition' may be traced to the Latin *intueor* or *intueri* meaning 'to contemplate' or 'look within.' Daniel Kahneman and Amos Tversky defined intuitive judgments as those that are arrived at by an informal and unstructured mode of reasoning without the use of analytical methods or deliberative calculation.²⁷ Theory and research suggest that intuition encompasses expertise, judgment and implicit learning, sensitivity and feelings, rumination, incubation, and creativity.²⁸ But how do executives themselves understand intuition? In Parikh's studies, executives were asked to indicate what they personally understood by the term 'intuition.' Descriptions offered included: decision or perception without recourse to logical or rational methods; inherent perception; inexplicable comprehension; a feeling that comes from within; integration of previous experience; and processing of accumulated information (only a very small minority of respondents described it as a 'sixth sense').

We define intuition as a form of knowing that manifests itself as an awareness of thoughts, feelings, or bodily sense connected to a deeper perception, understanding, and way of making sense of the world that may not be achieved easily or at all by other means.

Recommendation 2: Don't mix up your I's

A well-honed understanding of intuition does not confuse it with: (1) *insight*: this literally means seeing the solution to the problem, and while we may not always be able to see in a visual sense the solution that we have arrived at, we can usually explain its elements and their logical inter-relationships. Hence insight ultimately is conscious and explicable (sometimes after a process of incubation—see below); (2) *instinct*: these are the in-built fast biological reactions with which evolution has equipped us in order that we can respond to

stimuli in ways that maximize our chances of survival in the face of a physical threat; (3) *incubation*: this is the unconscious processing of information which may yield an insight solution in the apocryphal (and insightful) 'eureka' moment. Incubation is related to intuition (and insight) in that it is the unconscious part of a process whereby an intuition (something that we feel but may be unable to articulate) may become validated as an insight (an explicable solution to a problem).²⁹ However, not all intuitions become insights; their logical relations may not become clear, and they may remain for a time as un-validated hazy felt senses or hunches which may eventually reveal their accuracy or otherwise. Similarly not all insights come to us via intuitions, in that the solution may come very quickly, and a developing felt sense may not be discernable.

Sources of Intuition

'What are the sources of intuition?' is a crucial question in coming to an understanding of the role that intuition can play in decision-making and how it may be managed more effectively. Is intuition tacit knowledge³⁰ acquired through implicit learning? Is it the output from a library of expertise built up over many years? Is it a response driven by significant emotional memories? Is it derived from deeper bodily feelings? Or is it a combination of all these things? As noted earlier, intuition differs from instinct (in-built automatic fast biological responses) and from insight (literally 'seeing' a solution to a problem and its logical relations).

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Intuition relies on both expertise (manifested as subconscious decision heuristics) and feelings (manifested as the affect associated with a particular stimulus). From this standpoint a view emerges of intuition as a form of cognition that operates in two ways: 'knowing' (what we will call 'intuition-as-expertise' and the related notion of intuition as an aspect of sense-making); and in a way that connects mind and body through 'feeling' (we will call this interpretation 'intuition-as-feeling').

There are two further key points to be made at this juncture. First, intuition-as-knowing and intuition-as-feeling interact and may be indistinguishable from the point of view of the individual. Sec-

ond, intuition as a way of knowing also may sit comfortably alongside rationality as an alternative or complementary form of cognition. There are of course other interpretations of intuition, including the spiritual and mystical perspectives, but we have chosen not to consider these here.³¹

1. Intuition-as-Expertise

Consider the following hypothetical vignette based on an amalgam of many of the senior executives with whom we have worked:

Daniel is a senior executive with fifteen years of experience. He has been in many challenging and varied situations that have demanded quick and decisive action throughout his career. One of the qualities that those around him admire in Daniel is his ability to make quick and often accurate decisions in the face of complex problems. But it wasn't always like that for Daniel. As a young and inexperienced manager straight out of his MBA, he made mistakes like everybody else. He often couldn't see the woods for the trees. The consequences of some decisions that he made were significant; others were less critical. However, what is important is that he learned explicitly and implicitly from his experiences. He internalized the lessons learned (sometimes tacitly), noticed connections that were reinforced by feedback, and acquired new routines and rules of behavior (sometimes without realizing it), and these became part of his cognitive makeup (even though he may not be able to articulate this).

The upshot of this is that when Daniel meets simple or not-so-simple situations like those that he has met in the past, or that share salient features with past experiences, he can call upon a repertoire of potential responses and search for a fit. Daniel's knowledge base is akin to an expert system built up over many years of hard work in learning consciously and unconsciously through experience and accumulating wisdom. Often when he makes a decision or gives a view on an issue, it looks to outsiders uncannily like a 'management instinct,' but much of this is experience and analysis frozen over time into familiar routines and habitual responses which give him a confidence in his own intuitive capabilities to the extent that more often than not he does not need to subject himself to information overload and the risk of analysis paralysis.

But how can executives, like our hypothetical Daniel, acquire the expertise that enables them to respond intuitively to problems and decisions and come up with a single viable option? One way is through explicit and implicit learning processes. The concept of explicit learning is familiar to us as an observable or conscious process often with an element of intent. Implicit learning, on the other hand, is a way in which knowledge is acquired by processes that are largely involuntary and independent of any conscious attempt to learn.³² Implicit learning is pervasive and may result in the acquisition of tacit knowledge that cannot be described or explained easily but which is stored in long-term memory in a variety of mental structures or patterns of thinking. This knowledge may take the form of images, episodes, or narratives and can be stored as rules (often too complex for verbal exposition) for how to achieve specific goals in particular situations.

The quality and utility of the knowledge gained from incidental and unplanned learning opportunities depend upon the extent to which feedback is used positively to nurture intuitive skills and develop good intuitions.

The quality and utility of the knowledge gained from incidental and unplanned learning opportunities depend upon the extent to which feedback is used positively to nurture intuitive skills and develop good intuitions. However, feedback is like a double-edged sword, and the form it takes and the way it is delivered are crucial in determining if an executive's environment enhances or suppresses good intuitions. Hogarth describes environments that enhance intuition through good feedback as 'kind' structures for learning; 'wicked' structures for learning on the other hand are those contexts that may suppress intuition or lead to the development of poor intuitive awareness through little or low-quality feedback.³³

Many will be aware of classic experiments in which chess grand masters' recall capabilities became perplexed by the random placing on the board of the chess pieces (in this situation their recall was no better than that of a novice) compared with their superior recall when the placement of the pieces was meaningful (non-random and patterned, as they may be in a real game and thus encoded or approximated in long-term memory).³⁴ This helps to explain how it is that when an expert encounters a problem where the informa-

tion can be matched to a familiar pattern, a decision protocol may be executed almost automatically.

In other experimental studies, participants have been required to recognize a coherent pattern and if they were uncertain were asked to guess. The results led the researchers to conclude that individuals can respond in a discriminative way to coherences that they could not consciously and explicitly identify and that it was tacit understanding that guided their intuitive hunches.³⁵ In a different context, Klein's study of split-second decision-making by firefighters found little that corresponded to the accepted rational model; rather there appeared to be a rapid and unconscious situation assessment and recognition from an array of stored templates followed by the taking of appropriate action when a fit was found.³⁶

In certain situations, in bypassing in-depth conscious attempts at analysis, intuition enables executives to move rapidly to a plausible and credible solution. This interpretation of intuition as an unconscious expertise differs from models of purely heuristic thinking in that the latter are narrowly focused on predetermined rules, whereas the former is based upon a broad constellation of past experiences, knowledge, skills, perceptions, and feelings held tacitly and often arrived at by an implicit perception of the total problem³⁷ before conscious awareness takes hold. Tacitly held knowledge does have behavioral correlates. For example, researchers have found significant relationships between executives' levels of tacit knowledge and a number of criterion measures including success in generating new businesses and performance in managerial simulation exercises.³⁸

In many situations it is simply not possible for an individual to explore in a rigorous, methodical, and exhaustively analytical manner all the data that he or she confronts; indeed to do so might result in analysis paralysis. The reason for this is that rational analysis as an information-processing capacity may not be suited to the volume or complexity of the information load encountered. Compounding this overload problem is the assumption that having more information leads to more rational decisions. Instead of rigorously exploring all the available options, the experienced, intuitive executive's cognitive system becomes programmed to look for cues that relate to previously experienced patterns. The former managing director of Whirlpool Australia, when asked to reflect on the important decisions he faced throughout his career, summed up the importance of gut-feel when he said that it is crucial for executives to "assemble the facts in a meaningful way; CEOs

have an intuition about them, they have an instinctive nature, they are watching, listening, gathering all of the time. If you are not doing that as a CEO, then you are not fulfilling your role."³⁹ The mental shortcuts that follow from the meaningful weaving together of these assembled facts are efficient ways for the manager to deal with complex and fast-changing situations where information-processing resources may be at a premium. The result is an optimization of cognitive load.

This process works well in the situations where a fit with an extant pattern is found. However, intuitive expertise may not work so smoothly if the new situation has features that do not appear to match or approximate those that have been previously encountered. Klein argues that in these situations individuals look for further cues to try to interpret any anomalies, keeping perceptions open and attuned, and constructing narratives that make sense and overcome the 'background noise' that may impede efforts at interpretation. Under these circumstances intuition may be thought of as a sense-making process⁴⁰ whereby concepts and their relationships may be re-defined and adjustments made to the relevant mental structures to take situational differences into account. The structures themselves become adapted and more elaborated through the process of learning. For new information to be accommodated in this way can take time. Hence it may take longer to arrive at a solution that 'feels' right, and therefore the decision process may be more labored and more demanding of cognitive resources.

Recommendation 3: Elicit good feedback

The actions and experiences of executives and the associated implicit learning processes are important tools in building intuitions.⁴¹ However, learning through implicit processes can become passive and reactive. In this situation executives' learning is likely to be strongly influenced by the characteristics of the task or the context in which they find themselves. As noted earlier, the knowledge gained from incidental and unplanned learning opportunities depends crucially upon feedback (for example, in terms of Hogarth's 'kind' and 'wicked' structures for learning). The feedback that an executive receives can be misleading. For example, if he or she is surrounded by employees who are not prepared to challenge decisions made from the top, the learning structure of the environment may be wicked in the sense that it is unlikely to lead to good intuitions because wrong lessons will have been learned. Contrast this with a more constructively critical environment or an experienced

coach or mentor who is able to give honest, accurate, and constructive feedback on an executive's behaviors, attitudes, and performance. This would help create an environment with a kind learning structure which in turn may lead to good intuitions because the right lessons will have been learned from a more faithful and honest interpretation of action.⁴²

How *kind* or *wicked* is your learning environment? For example, in terms of the extent to which intuition is supported or suppressed, and in terms of the quality of the feedback that you receive?

How could you make it *less wicked* for nurturing your intuitive skills?

What could you do to make it *kinder* for nurturing your intuitive skills?

2. Intuition-as-Feeling

For many people intuition is synonymous with 'gut feel,' and this somatic view of intuition (from the Greek *soma* for 'body' and meaning a bodily sense) is ubiquitous across cultures and languages. For example, in Hebrew we have the phrase *tchushat beten*, literally 'feeling stomach.' One approach to understanding this feelings-based perspective is by examining recent neuropsychological research. The following experiment was reported in the *New York Times* in 1997:

The neurologist Antonio Damasio and his colleagues Hannah Damasio, Antoine Bechara, and Daniel Tranel explored the levels of emotion felt by participants during a card game in which the decision to choose from decks A and B resulted in large gains or losses, whereas deciding to choose from decks C and D resulted in small gains or losses. Emotional reactions during the game were measured using changes in skin conductance that occur as a result of 'micro-sweating.' Damasio was interested in the ways in which participants appeared to learn unconscious decision behaviors to avoid decks A and B (the micro-sweating is thought to reflect tiny flickers of emotion that are below the level of conscious awareness). The measures revealed that participants experienced a marked increase in skin conductance prior to choosing from decks A and B, even though they were unable to verbalize what they were doing and why.

From Damasio's research it appeared that a tacit awareness below participants' level of conscious-

ness triggered a somatic response (manifested as micro-sweating) to the effect that the decision to choose from decks A and B was undesirable. The tacit system governing these feelings appeared to be activated (and in a sense knew more than the explicit system) before participants were consciously aware that they had made a decision. Furthermore, the observation that participants couldn't articulate these feelings adds weight to the view of intuition as having unconscious and somatic components. In his research Damasio focused on negative outcomes of decision choices, arguing that physiological somatic markers force attention to the undesirable outcomes that may accrue from certain actions. The sensation associated with this unconscious process is an unpleasant gut feeling.

Goleman argued that as well as serving as a warning against certain courses of action, intuitions can also operate positively to alert us to opportunities and that being attuned to personal feelings (bodily senses) makes for sounder personal decision-making.⁴³ The neural scientist Joseph LeDoux argued that even when we are conscious of the outcome of an appraisal of a situation, such as feelings toward a particular person (for example, a feeling of like or dislike), we do not necessarily consciously understand the basis of the appraisal (knowing why we have the feeling). The conscious outcome may be based upon our inarticulable gut feel.

In evolutionary terms the limbic system which is implicated in these intuitive processes is one of the older parts of the brain and may be a source of the intuitive signals that manifest themselves as automatic somatic alarm bells. LeDoux suggests that the *amygdala* (a part of the forebrain's limbic system involved in functions relating to anger and aggression) may exercise direct control over our actions before the higher centers of the brain are fully aware of what is happening (referred to by some as 'emotional hi-jacking'⁴⁴). These bodily senses may aid executives' decision-making by quickly and covertly sifting through fine details and providing feelings-based signals for or against a course of action, but on the other hand they may also override the higher centers of the brain and play a central role in the ways in which emotions impact upon our actions.

Recommendation 4: Get a feel for your batting average

Gut feelings are inevitable, but effective learning from them is not. Paying particular attention to the success of intuitions is important because we are

all prone to fears, emotions, and sources of bias⁴⁵ which may impact upon the efficacy of intuitive decision-making. Testing out the validity of gut feelings over time can help an individual executive determine how much trust she or he can put in them.

Gut feelings are inevitable, but effective learning from them is not.

This personal benchmarking is a vital part of the development of intuitive awareness because it can assist with validating a gut feel, identifying misleading inferences and counteracting any predisposition to over-rely on intuition in situations when a rational approach may be more appropriate. It also can help to distinguish intuition from fears and other emotions. Furthermore, the emotional reward and euphoric feelings that an executive may get by intuitively "calling it right" need to be balanced against other less accurate intuitive judgment calls that might be made just as often but which sometimes might be overlooked or misconstrued in the absence of critical reflection. The following questions can be used to get a more systematic feel for your batting average⁴⁶ in the context of specific incidents where gut feel played some role.

Think of an instance where you relied on your gut feel that resulted in a *positive* outcome. What was the *context*? What *happened* and what were the *consequences*? Can you identify the *assumptions and inferences* that led you to follow the gut feel? What were they?

Think of an instance where you relied on gut feel that resulted in a *negative* outcome. What was the *context*? What *happened* and what were the *consequences*? Can you identify the *assumptions and inferences* that led you to follow the gut feel? What were they?

Intuition and Imagery

One aspect of intuition common to both the expertise-based and feelings-based perspectives is the limitation imposed by language upon the expression of intuitions. Attempts at verbalization can restrict access to the more tacit ways of knowing such as intuition,⁴⁷ and the unconscious incubations that eventually lead to insight may literally be beyond words. Language by its nature segments and analyzes our experiences of the world

into concepts, and we also use words as a means of expressing our understanding of the relationships between concepts. When an executive eventually solves a problem by insight, the result is that he or she can probably explain the solution. But unlike insights, intuitions cannot be readily put into words (indeed this is one of the key differences between insight and intuition). The anthropologist Charles Laughlin argued that limiting legitimate knowledge to that which the brain's linguistic structures can express acts to restrict the scope of human knowing.⁴⁸ Hence, in some ways language is a double-edged sword that enables us to label and express our emotions, thoughts, and intentions but also restricts our thinking by acting as a sieve, filtering our experiences of and feelings about the world through a verbal screen. The word (a symbol) is substituted for the experience or feeling; hence when we try to express our intuitions, we communicate them second-hand through the linguistic symbols which we use in order to represent them to others.

Intuition may manifest itself as an image or narrative. Historical and anecdotal accounts testify to the important role that imagery plays in creative and intuitive functioning. Many scientists and technologists attach a great deal of importance to mental images in the process of idea generation, scientific problem solving, and invention.⁴⁹ Creative intuition is a valuable tool for those decisions that require divergent thinking processes. Since it is not necessarily a verbal process and hence is difficult to articulate, the use of images provides an alternative to the linear, convergent processing that the "censoring" function of verbalization and rational analysis may impose upon creative intuition.

Recommendation 5: Use imagery

It has been argued that the mode of presentation of a problem can exert an influence over the way in which it is solved. Drawing upon research involving a number of decision-making and probability-related tasks (such as the card problem, the age-drinking problem, and the 'Linda' problem) in which participants often overlook disconfirmation, Hogarth argued that visual presentations can provoke an intuitive understanding which is arrived at implicitly and held tacitly but which may provide an alternative way of identifying anomalies. The more people are able to think visually, the more likely they are to use intuitive processes.⁵⁰ The following is a simple decision visualization exercise.⁵¹

Imagine that you are in a place that you know and are walking down a well-worn path. While you are walking, you are going over a situation that is challenging you. The path breaks ahead of you into a number of routes, each representing one of your alternatives. Notice how you *feel* when you contemplate each one. Where does each path take you? What is each path's effect on you? How hard is it to visualize walking down one path? Does one path *feel* better than the others? Visualize your chosen path in a number of years time? How does this *feel* to you?

Exercises relying exclusively upon narratives and images based upon meaningful (concrete rather than abstract) contexts can be helpful in postponing the censorship of language and rational analysis and also in enabling executives to make implicit judgments that may be difficult to articulate verbally.⁵² This does not mean that problems visualized necessarily will be solved correctly, but the use of imagery may create better conditions for intuitive processes to occur.

Bias Beware!

It has been said of intuition that it is 'sometimes wrong but never in doubt.' The buzz from making great decision calls through intuition can be quite seductive. However, bias (with the possibility of attendant negative consequences) is just as likely to be present in intuitive decisions as in any other types of decision processes. Hence, it is important that the feelings of certitude that may accompany some intuitions are subject to scrutiny and that they are managed as effectively as possible in order to overcome any biases and to ameliorate negative outcomes. Not all types of bias apply across all kinds of decision processes,⁵³ and in this regard executives need to beware of a number of potential sources of error and bias in relation to intuition.

(1) *Ease of recall*: individuals judge events that are easy to remember as being more frequent than those that are less easily recalled. Successful intuitions may be easily recalled and hence judged to be more frequent than they actually are. This in turn may have the effect of reinforcing the belief that successful intuitive judgment calls are frequent. Executives should ask themselves: Are easy-to-remember intuitions as frequent as they appear to be and poor intuitive judgment calls simply forgotten?

(2) *Presumed associations*: individuals tend to overestimate the probability of two events co-

curing, and the strength of the presumed relationship may be fallacious. Executives should probe their intuitive feelings about a decision and the associated cause-and-effect relationships and try to distinguish intuition from fallacies.

(3) *Over-confidence*: the emotional reward from past successes in intuitive judgments may give rise to an unjustified feeling of the infallibility of intuition, which may in turn contribute to the illusion of control and lead to over-confidence in one's intuitive decision-making abilities. Executives should try to distinguish intuition from over-confidence and be realistic about their abilities to control events through intuitive or rational means.

(4) *Confirmation bias*: we tend to seek confirmatory evidence for what we think is true and neglect the search for dis-confirmatory evidence. What we want to happen and what might happen may be two very different things so the emotion of desire and the feelings about the rightness or wrongness of a course of action need to be weighed up as objectively as possible. Executives should try to distinguish intuition from wishful thinking.

(5) *Hindsight bias*: we sometimes overestimate the degree to which an outcome was correctly predicted. The 'knew-it-all-along' (or 'I should have followed my gut feel all along') syndrome can be a significant source of error in human judgment. Executives should try to distinguish intuition from 20-20 hindsight by developing explanations for the occurrence of outcomes that did not happen and by examining the ways in which a distorted view of the past may influence their decision-making in the future.⁵⁴

Recommendation 6: Play devil's advocate

Sources of bias can lead individuals to adopt a closed mind when it comes to challenging the information that supports their intuitions (or indeed their rationality). Belief perseverance can be counteracted by getting into the habit of constructing a narrative for why a contrary theory might be true.⁵⁵ Devil's advocacy is a procedure in which one or more persons (or oneself in the absence of others) raise objections to favored choices, challenge underlying assumptions, and point out alternatives. By playing devil's advocate and generating counter-arguments, executives can probe intuitive decisions for inconsistencies, inaccuracies, and irrelevancies.⁵⁶ Alternative courses of action can then be suggested and explored. This process can expose weaknesses in an executive's intuitions or provide support for them, but either way the important thing is that the opportunity has been provided for refutation. Devil's advocacy has been

shown to produce significantly higher-quality decisions compared to consensus group decisions and is especially useful in ill-structured problem scenarios of the type where intuition might need to be relied upon. The dangers of a 'positive hunch' should be checked out by actively seeking facts that might corroborate or invalidate the hunch.⁵⁷ Executives can play devil's advocate by asking these questions of their own or others' intuitions:

Are you mixing up your intuitions with *easily remembered* (significant) events?

Are you underestimating the chance *co-occurrence* of two events?

Are you being *over-confident* in your judgments?

Are you looking for confirmatory evidence for what you *hope* is true and neglecting any contrary evidence?

Are you mixing up intuition with *wishful thinking*?

Are you sometimes guilty of *20-20 hindsight*?

Balancing Intuition and Rationality

A central feature of critiques of the rational decision model was that organizational complexity and the cognitive capacity of decision-makers may combine to render rational decisions 'good enough' (satisficing) rather than 'ideal' (optimizing) behaviors. Hence, outcomes are not irrational but are reasoned only within limits.⁵⁸ This treatment of rationality as bounded is one way in which executives can reduce the cognitive load placed upon them. It is important to stress that within this purview we are not proposing that intuition is *better* than rationality, or indeed vice versa. We are suggesting that a single-minded emphasis on rationality (or intuition) presents a partial view. Executives might achieve a more balanced perspective by considering both rationality and intuition as complementary and mutually reinforcing components of a decision strategy.

Intuition is a composite phenomenon that incorporates expertise and feeling, and as such is linked to mental processes both in the cerebellum and the limbic system and to bodily felt senses. It is not simply educated ('smart') guessing; it is more than 'flight or fight' (instinct) and is distinct from 'eureka' experiences (insight). It resides at a level below consciousness, arises cognitively, affec-

tively, and somatically and is manifested as a 'hunch' or 'gut feel.' These feelings may be associated with images or narratives or an abstract feeling of certitude about the rightness or wrongness of a course of action. When used intelligently, intuition has the potential to enhance executive judgment and decision-making.

Intuitive knowledge, understanding, and skill can be learned through experience and practice,⁵⁹ and over two decades ago Taggart and Robey⁶⁰ made a plea that the management education curriculum should include intuition. However, in our view, both as graduates of and teachers in management schools in our respective countries (the UK and Israel), the overall situation suggests that little has changed in the intervening twenty years. One can see reasons why the rational model prevails: it is safe, comforting, and reassuring, and in many situations it works perfectly well. The intuitive model has more risks attached to it, can be disconcerting, paradoxical and ambiguous, and in many routine situations is probably inadvisable. However, intuition is pervasive, automatic, and involuntary; therefore executives have much to gain from being able to accept it and manage it. Moreover, there are time-pressured and creative problem-solving situations where intuition is important and even necessary; therefore executives need to be able to harness its potential while being aware of its dangers.

Intuitive knowledge, understanding, and skill can be learned through experience and practice.

Recommendation 7: Capture and validate your intuitions

Hunches and gut feelings arise involuntarily, most often when the intuitive mind is given freedom to roam. However the natural tendency of the rational mind is to censor intuitions before they have a chance to be fully explicated and tested. It is possible for individual executives to develop techniques that may assist in creating the appropriate psychological and physiological conditions for intuitions (the 'inner state') and also to develop the skills to capture, in a systematic way, intuitions when they do occur. The importance of the outer environment and the creation of the appropriate inner state which may promote an intuitive 'flow' are discussed elsewhere.⁶¹

With regard to capturing this flow, it is possible through training to recognize and record intuitions

Table 1
Guidelines for Developing Intuitive Awareness

Recommendation	Description
1. Open up the closet	To what extent do you: experience intuition; trust your feelings; count on intuitive judgments; suppress hunches; covertly rely upon gut feel?
2. Don't mix up your I's	Instinct, insight, and intuition are not synonymous; practice distinguishing between your instincts, your insights, and your intuitions.
3. Elicit good feedback	Seek feedback on your intuitive judgments; build confidence in your gut feel; create a learning environment in which you can develop better intuitive awareness.
4. Get a feel for your batting average	Benchmark your intuitions; get a sense for how reliable your hunches are; ask yourself how your intuitive judgment might be improved.
5. Use imagery	Use imagery rather than words; literally visualize potential future scenarios that take your gut feelings into account.
6. Play devil's advocate	Test out intuitive judgments; raise objections to them; generate counter-arguments; probe how robust gut feel is when challenged.
7. Capture and validate your intuitions	Create the inner state to give your intuitive mind the freedom to roam; capture your creative intuitions; log them before they are censored by rational analysis.

before the censorship of rationality takes over. Once captured (admittedly in what may be the less-than-satisfactory medium of the written or spoken word), they can be analyzed and evaluated and patterns in the intuitive process identified. One way of doing this is by keeping a diary or otherwise documenting⁶² the intuition in terms of: the time of day at which it occurred; its content; the physical location at the time; its form (words, images, bodily feelings); and a reflection upon any biases, fears, or wishful thinking that might contaminate the intuition. This is most successfully achieved through a formalized diary process over a pre-defined period with personal reflection and feedback.⁶³ This and the other recommendations for developing intuitive awareness are summarized in Table 1.

Becoming Intuitively Intelligent

The relationship between intuition and rationality can work in a number of ways. For example, proceeding from *intuition* to *rational analysis* represents a 'validation' sequence in which gut feeling may be checked out by rational analysis by posing questions such as 'Do the data back up my hunch?' Proceeding from *rational analysis* to intuition represents an 'incubation' sequence in which intuition provides an expertise-based or feelings-based validation for judgments arrived at through rational analysis. For example, executives can ponder in a non-deliberative manner, 'What does my experience tell me about this decision?' 'Are there any lessons from the past that I can draw on?' or 'How does this decision *feel* to me?' Allowing one's thinking to iterate between intuition and rational

analysis may allow each mode to reinforce the other until an optimal judgment can be made that satisfies both the 'hard' elements (the facts and figures) and 'soft' elements (the hunch or gut feel). This process may provide a means by which biases from one source can be offset by those from the other.⁶⁴ It may also provide a 'cooling-off' mechanism for managing any overconfidence⁶⁵ that may accompany a rationally or intuitively derived decision choice.

Intuition and rationality are two parallel systems of knowing; in this sense they are dual processes. The conscious rational system has been described as intentional, analytic, primarily verbal, and relatively emotion-free; it encodes information in abstract symbols and concepts. The intuitive system has been described as automatic, holistic, primarily non-verbal, and associated with emotion and feeling; it encodes information in concrete forms such as examples, images, and stories⁶⁶ and as unconscious decision heuristics. Research indicates that both the expertise and feeling facets of intuition originate below the level of conscious awareness and are inter-linked. The rational system exists in conscious awareness alongside the intuitive system. The rational and the intuitive systems are not unbridgeable, and the challenge is to weave the two together⁶⁷ and integrate intuition with rationality in order to make *intelligent* use of intuitive judgments. Successful decision-makers are those who, in the words Adam Smith, "do not necessarily have a complete portrait of themselves, warts and all, but they do have the ability to stop abruptly when their own intuition and what is happening Out There are suddenly out of kilter."⁶⁸

The intuitive and rational mindsets are at the heart of an important dynamic in executives' cognition. The dichotomy of intuition and rationality is a false one. Moreover, the portrayal of intuition as the infallible but ineffable 'good guy' and rationality as the mechanistic but manageable 'bad guy' (or vice versa) is biased and erroneous.⁶⁹ It makes no sense to talk of intuition versus rationality but only of intuition *and* rationality. By considering only rationality, one is left with a partial means of knowing the world and its possibilities. Intuition and rationality are complementary to the extent that executives need to be able to learn how to use each to fit the demands of particular decision-making situations. The education and training of executives emphasizes rational analysis and, by and large, appears to pay scant regard to creative intuition. The challenge is for executives to extend, possibly through training, self-development, feedback, and coaching, their own repertoire of skills and strategies for intuitive judgment and to apply them frequently and naturally, and in doing so acquire a more comprehensive armory of decision-making skills.

Intuition and rationality are two parallel systems of knowing; in this sense they are dual processes.

Intuition is a natural component of executives' thinking but one that, although we are often all too aware of it, we may tend to ignore or consign to the closet, perhaps because it is perceived as unscientific and irrational. Intuition-as-expertise and intuition-as-feeling are unconscious but explicable; when understood and managed effectively, they can be a powerful force in complex and fast-moving business environments and can lead to improved executive decision-making capabilities through the development of a finely tuned intuitive intelligence.

Endnotes

¹ Robert Salmon, former vice-president of L'Oreal (<http://www.refresher.com/signals>); Lindsey Owen-Jones, chairman and chief executive officer of L'Oreal, in *Business Week Online*, 28 June 1999.

² Davis, S.H., & Davis, P.B. 2003. *The intuitive dimensions of administrative decision-making*. Lanham: Scarecrow; Eisenhardt, K.M. 1999. Strategy as decision-making. *Sloan Management Review*, Spring: 65–72. For a summary of the dominant paradigms, see Das, T.K., & Teng, B-S. 1999. Cognitive biases and strategic decision processes: An integrative perspective. *Journal of Management Studies*, 36(6): 757–778. The question remains as to where an intuitive decision mode fits within the spectrum of approaches identified by Das and Teng, op. cit., 759.

³ Hayashi, A.M. 2001. When to trust your gut. *Harvard Business Review*, February: 59–65.

⁴ Huber, G.P., & Daft, R.L. 1987. The information environments of organisations. In F.M. Javlin, et al. (Eds.). *Handbook of organizational communication*. Newbury Park, CA: Sage.

⁵ Hodgkinson, G.P., & Sparrow, P. 2002. *The competent organization*. Buckingham: Open University Press discusses the importance of rationality and intention.

⁶ Fineman, S. 1996: Emotion and learning. In S.R. Clegg, C. Hardy, & W.R. Nord (Eds). *Handbook of organization studies*. London: Sage: 545.

⁷ Leblebici, H., & Salancik, G.R. 1981. Effects of environmental uncertainty on information and decisions in banks. *Administrative Science Quarterly*, 26(4): 578–596; Narayanan, V.K., & Fahey, L. 1982. The micro-politics of strategy formulation. *Academy of Management Review*, 7(1): 25–34; Bourgeois, L.J., & Eisenhardt, K.M. 1988. Strategic decision processes in high velocity environments: Four cases in the micro-computer industry. *Management Science*, 34(7): 816–835.

⁸ The relationship between procedural rationality and decision-making effectiveness (DME) was positive and statistically significant and when controlling for environmental instability ($r = 0.35, p < 0.01; t = 2.30, p < 0.05$). See: Dean, J.W., & Sharfman, M.P. 1996. Does decision-making matter: A study of strategic decision-making effectiveness. *Academy of Management Journal*, 39(2): 368–396.

⁹ The correlation between rationality and uncertainty was negative and statistically significant ($r = -0.38, p < 0.01$). See: Dean, J.W., & Sharfman, M.P. 1993. Procedural rationality in the strategic decision-making process. *Journal of Management Studies*, 30(4): 587–620.

¹⁰ Daft, R.L., & Lengel, H.R. 1986. Organizational information requirements, media richness and structural design. *Management Science*, 32(5): 554–571. The research findings in support of these contrasting viewpoints are themselves somewhat complex. For example, Dean & Sharfman (1993) found that decision-makers engaged in less rational processes of strategic decision-making when faced with highly uncertain problems; whereas when there was little competitive threat, little perceived external control, and the issues being faced were well understood, executives used rational procedures. Fredrickson & Mitchell (1984) reported a negative relationship between rationality and organizational performance and used it as introductory evidence that rational models are not appropriate for some environments. Further research by Fredrickson (1984) established a positive relationship between rationality and performance in stable environments. See Fredrickson, J.W., & Mitchell, T.R. 1984. Strategic decision processes: Comprehensiveness and performance in an industry with an unstable environment. *Academy of Management Journal*, 27(2): 399–423; Fredrickson, J.W. 1984. The comprehensiveness of strategic decision processes: Extension, observations, future directions. *Academy of Management Journal*, 27(3): 445–466; Priem, R.L., Rasheed, A., & Kotulik, A. 1995. Rationality in strategic decision processes, environmental dynamism and firm performance. *Journal of Management*, 21 (5): 913–929.

¹¹ Goleman, D. 1998. *Working with emotional intelligence*. New York: Bantam Books.

¹² Hodgkinson & Sparrow, op. cit.

¹³ Bargh, J.A., & Chartrand, T.L. 1999. The unbearable automaticity of being. *American Psychologist*, 54(7): 462–479.

¹⁴ Parikh, J. 1994. *Intuition: The new frontier of management*. Oxford: Blackwell Business.

¹⁵ Burke, L.A., & Miller, M.K. 1999. Taking the mystery out of intuitive decision-making. *The Academy of Management Executive*, 13(4): 91–99.

¹⁶ Isenberg, D.J. 1984. How senior managers think. *Harvard Business Review*, November/December: 81–90.

¹⁷ Overell, S. 2001. Trust you gut. *Director*, July: 28.

¹⁸ Hayashi, 2001, op. cit., 61.

¹⁹ Benner, P., & Tanner, C. 1987. How expert nurses use intuition. *American Journal of Nursing*, January: 23–31; Davis & Davis, op. cit.

²⁰ See Allinson, C.W., & Hayes, J. 1996. The Cognitive Style Index: A measure of intuition-analysis for organizational research. *Journal of Management Studies*, 33(1): 19–135; Allinson, C.W., Chell, E., & Hayes, J. 2000. Intuition and entrepreneurial behavior. *European Journal of Work and Organizational Psychology*, 9: 31–43; Sadler-Smith, E. 2004. Cognitive style and the management of small and medium sized enterprises. *Organization Studies*, 25: 155–181; Clarke, I., & Mackaness, W. 2001. Management intuition: An interpretative account of structure and content of decision schemas using cognitive maps. *Journal of Management Studies*, 38(2): 147–172.

²¹ Gardner, W.L., & Martinko, M.J. 1996. Using the MBTI to study managers: A literature review and research agenda. *Journal of Management*, 22(1): 45–83.

²² Westcott, M.R. 1968. *Toward a contemporary psychology of intuition*. New York: Holt, Rinehart & Winston.

²³ O'Reilly, C.A. 1980. Individuals and information overload in organizations: Is more necessarily better? *Academy of Management Journal*, 23(4): 684–696.

²⁴ Sparrow, P.R. 1999. Strategy and cognition: Understanding the role of management knowledge structures, organizational memory and information overload. *Creativity and Innovation Management*, 8(2): 140–148.

²⁵ McCutcheon, H.H.I., & Pincombe, J. 2001. Intuition: An important tool in the practice of nursing. *Journal of Advanced Nursing*, 35: 342–348; Atkinson, L. 2000. Trusting your own judgment. In Atkinson, T., & Claxton, G. (Eds). 2000. *The intuitive practitioner*. Buckingham: Open University Press: 53–66; Goldberg, P. 1989. The many faces of intuition. In W.H. Agor (Ed.), *Intuition in organisations: Leading and managing productively*. Newbury Park, CA.: Sage Publications.

²⁶ The questions are useful only as a starting point for self-reflection and should not be used as a basis for typecasting. For example, Einstein is seen by many as the archetypal rational mind, but he is widely reported as recognizing intuition as the 'sower of all true science.' See Dunne, B.J. 1997. Subjectivity and intuition in the scientific method. In R. Davis-Floyd & P. Sven Arvidson (Eds), *Intuition: The inside story: Interdisciplinary perspectives*. London: Routledge. For valid and reliable self-report measures of intuition and their psychometric evaluation, the following research may be consulted: Allinson & Hayes, 1996, op. cit.; Epstein, S., et al. 1996. Individual differences in intuitive-experiential and analytical-reasoning thinking styles. *Journal of Personality and Social Psychology*, 71: 390–405; Hodgkinson, G.P., & Sadler-Smith, E. 2003. Complex or unitary? A critique and empirical reassessment of the Allinson-Hayes Cognitive Style Index. *Journal of Occupational and Organizational Psychology*, 76: 243–268; Scott, S.G., & Bruce, R.A. 1994. Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, 37: 580–607.

²⁷ Kahneman, D., & Tversky, A. 1982. On the study of statistical intuitions. *Cognition*, 11: 123–141.

²⁸ Claxton, G. 2001. The anatomy of intuition. In Atkinson, T., & Claxton, G. (Eds). *The intuitive practitioner*. Buckingham: Open University Press: 32–52.

²⁹ This is the way in which Wallas (1926) described intuition in the context of creativity and insight in his incubation-illumination theory of creativity. See Wallas, G. 1926. *The art of thought*. New York: Harcourt Brace.

³⁰ Polanyi argued that there existed a tacit knowledge

whose contents are not part of one's normal consciousness or open to introspection (in essence 'we know more than we can tell'). See Polanyi, M. 1966. *The tacit dimension*. New York: Doubleday.

³¹ See Vaughan, F. 1979. *Awakening intuition*. New York: Doubleday.

³² Reber, A.S. 1993. *Implicit learning and tacit knowledge: An essay on the cognitive unconscious*. New York: Oxford University Press. Recent advances in cognitive science and artificial intelligence suggest that intuition-as-expertise is an outcome of long periods of learning and expertise. See Tsang, E.W.K. 2004. Towards a scientific inquiry into superstitious business decision making. *Organization Studies*, 25: 923–946.

³³ Hogarth, R.M. 2001. *Educating intuition*. Chicago: The University of Chicago Press.

³⁴ Simon, H.A. 1989. Making management decisions: The role of intuition and emotion. In W.H. Agor (Ed.). *Intuition in organizations: Leading and managing productively*. Newbury Park, CA.: Sage.

³⁵ Bowers, K.S., et al. 1990. Intuition in the context of discovery. *Cognitive Psychology*, 22: 72–110.

³⁶ Klein, G. 2003. *Intuition at work: Why developing your gut instincts will make you better at what you do*. New York: Currency Doubleday.

³⁷ Davis & Davis, op. cit., 59; Bruner, J.S. 1960. *The process of education*. Cambridge, MA.: Harvard University Press.

³⁸ Wagner, R.K. 2002. Smart people doing dumb things: A case of managerial incompetence. In R.J. Sternberg (Ed.). *Why smart people can be so stupid*. New Haven & London: Yale University Press. Related research also suggests that: (1) tacit knowledge is not related to IQ; (2) the relationship between tacit knowledge and performance is independent of relations between personality and performance.

³⁹ http://www.ceoforum.com.au/200210_reflections.cfm.

⁴⁰ Klein, op. cit., 124; Jenkins, M., & Johnson, G. 1997. Entrepreneurial intentions and outcomes: A comparative causal mapping study. *Journal of Management Studies*, 34 (Special Issue): 895–920.

⁴¹ Weick, K.E. 2001. *Making sense of the organisation*. Oxford: Blackwell Business.

⁴² Hogarth, op. cit.

⁴³ Damasio, A.R. 1994. *Descartes' error: Emotion, reason and the human brain*. New York: Harper Collins/Quill; Goleman, D. 1996. *Emotional intelligence: Why it can matter more than IQ*. London: Bloomsbury.

⁴⁴ LeDoux, J. 1996. *The emotional brain*. New York: Touchstone/Simon & Schuster. Goleman uses the term 'emotional hijacking' in his popularization of LeDoux's research. See: Goleman, D., 1996, op. cit.

⁴⁵ Russo, J.E., & Schoemaker, P.H.J. 1992. Managing overconfidence. *Sloan Management Review*, Winter: 7–17; Taggart, W. 1997. Discovering and understanding intuition. *Exceptional Human Experience*, 15(2): 174–188.

⁴⁶ 'Batting average' is used in the English game of cricket; an alternative might be 'strike rate.'

⁴⁷ Hogarth, op. cit.

⁴⁸ Laughlin, C. 1997. The nature of intuition: A neuropsychological approach. In R. Davis-Floyd & P. Sven Arvidson (Eds). *Intuition: The inside story: Interdisciplinary perspectives*. London: Routledge.

⁴⁹ Ward, T.B., Smith, S.M., & Finke, R.A. 1999. Creative cognition. In R.J. Sternberg (Ed.). *The handbook of creativity*. Cambridge: Cambridge University Press. The quantum physicist Richard Feynman claimed that one of the reasons Einstein failed to develop a unified theory was that he stopped thinking in concrete physical images and turned to the manipulation of

equations. See Monsay, E.H. 1997. Intuition in the development of scientific theory and practice. In R. Davis-Floyd & P. Sven Arvidson (Eds). *Intuition: The inside story: Interdisciplinary perspectives*. London: Routledge. Numerous examples exist in the history of thought in science, the arts, and many other fields of human endeavor which attest to the significant role played by imagery (visual, auditory, and kinesthetic).

⁵⁰ Hogarth, op. cit., 231.

⁵¹ Adapted from Watts, G.W. 1993. Exercises for bringing head and heart together. *Training & Development*, November: 17–19.

⁵² See: Reid, P. 2002. *How to think: Building your mental muscle*. London: Prentice Hall.

⁵³ Das & Teng, op. cit.

⁵⁴ Bukszar, E., & Connolly, T. 1988. Hindsight bias and strategic choice: Some problems in learning from experience. *Academy of Management Journal*, 31(3): 628–641.

⁵⁵ Myers, D.G. 2002. *Intuition: Its powers and perils*. New Haven: Yale University Press: 118.

⁵⁶ Russo, J.E., & Schoemaker, P.H.J. 1992. Managing overconfidence. *Sloan Management Review*, Winter: 7–17; Schwenk, C.R. 1984. Devil's advocacy in managerial decision-making. *Journal of Management Studies*, 21: 153–168.

⁵⁷ Schweiger, D.M., Sandberg, W.R., & Rechner, P.L. 1989. Experiential effects of dialectical enquiry, devil's advocacy, and consensus approaches to strategic decision-making. *Academy of Management Journal*, 32: 745–772; Herbert, T.T., & Estes, R.W. 1977. Improving executive planning by formalising dissent: The corporate devil's advocate. *Academy of Management Review*, 2: 662–667; Rowan, op. cit., 196.

⁵⁸ See, for example, Miller, S.J., Hickson, D.J., & Wilson, D.C. 1999. Decision-making in organizations. In Clegg, S.R., Hardy, C., & Nord, W.R. (Eds). *Managing in organizations: Current issues*. London: Sage; Klein, G. 2003. *Intuition at work*. New York: Century Doubleday; Davis & Davis, op. cit.

⁵⁹ Monsay (1997) cites the views of scholars including Carl Rogers and Jonas Salk in support of the assertion that under the right conditions intuition can be developed. See Monsay, E.H. 1997. Intuition in the development of scientific theory and practice. In R. Davis-Floyd & P. Sven Arvidson (Eds). *Intuition: The inside story: Interdisciplinary perspectives*. London: Routledge.

⁶⁰ Taggart, W., & Robey, D. 1981. Minds and managers: On the dual nature of human information processing and management. *Academy of Management Review*, 6: 187–195.

⁶¹ For example, being mindful is an acute awareness of one's

surroundings, thoughts, and behaviors and is engendered by pausing and examining our perceptions and feeling states as dispassionately as we can through a non-reactive awareness and openness to whatever the object of our attention is and our context, with the aim of avoiding premature cognitive commitment (see Austin, J.H. 1998. *Zen and the brain*. Cambridge, MA.: The MIT Press). Taggart described a quiet, relaxed mind that is focused upon the present moment and free of distracting fears and desires as the *sine qua non* of intuitive experience (1997, op. cit., 182). Intuitive flow experiences are discussed extensively in Csikszentmihalyi, M. 1992. *Flow: The psychology of happiness*. London: Rider.

⁶² Taggart, op. cit., 181; Agor, op. cit., 222–223.

⁶³ Sadler-Smith, E., & Shefy, E. 2004. Developing intuition: Becoming smarter by thinking less. *Academy of Management Best Paper Proceedings*, Academy of Management Annual Meeting, New Orleans, Louisiana, August 2004.

⁶⁴ Shapiro, S., & Spence, M.T. 1997. Managerial intuition: A conceptual and operational framework. *Business Horizons*, January/February: 63–68.

⁶⁵ Russo & Schoemaker, op. cit.

⁶⁶ See Epstein, S. 1994. Integration of the cognitive and the psychodynamic unconscious. *American Psychologist*, 49: 709–724. Stanovich and West make a similar distinction between System 1 processes that are fast, heuristic, associative, and automatic and System 2 processes that are rule-based, slow, load heavily on working memory, and are controlled. See Stanovich, K.E., & West, R.F. 2000. Individual differences in reasoning: Implications for the rationality debate? *Behavioral and Brain Sciences*, 23: 645–726.

⁶⁷ Haidt, J. 2001. The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychological Review*, 108(4): 814–834.

⁶⁸ Slovic, P. 1972. Psychological study of human judgment: Implications for investment decision-making. *The Journal of Finance*, 27(4): 779–799.

⁶⁹ Writers such as the anthropologist Charles Laughlin attribute this dichotomy to the historical association of intuition with metaphysics and religion. In the Enlightenment and beyond, religion became the nemesis of science, and hence the 'intuition baby' was thrown out with the 'metaphysical bathwater.' See Laughlin, C. 1997. The nature of intuition: A neuropsychological approach. In R. Davis-Floyd & P. Sven Arvidson (Eds). *Intuition the inside story: Interdisciplinary perspectives*. London: Routledge.



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