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'To be, or not to be, that is the question': understanding decision making through literary models

The discipline of *decision sciences* seeks to develop theories and methods of formulating and solving general decision problems. Decision scientists study the environment in which decisions are to be made, including the conditions that could prevail in the environment. Decision scientists might also conduct scientific experiments, to comprehend the processes through which various outcomes may be realised. Such experiments have the potential of informing the decision makers on the cause–effect relationships between the alternative sets of actions available to them and the emerging respective consequences. A decision maker may have a different set of utilities associated with different outcomes. Decision scientists analyse the utilities of respective consequences resulting from alternative actions available to the decision maker, according to an appropriate system of utility assignment based on the preferences indicated by the decision maker. Challenges may exist at every step of such analyses. These may include acquisition of information pertaining to the nature of outcomes, such as the process of attaining the desired outcome, the benefits associated with it, and the cost of not seeking other alternatives. The decision scientist seeks to resolve these challenges by looking for an optimal solution, on the basis of some criteria that either maximise utility—or benefit—to the decision maker or minimise the cost. In the face of incomplete information, the actions recommended to the decision maker are usually a course of resolution, not necessarily a clear-cut solution.

Decision making is often described as an art. While one often hears of analysis of decisions described as a scientific endeavour, the practice of decision making is generally described as an art. Yet, decision scientists seldom investigate the arts, in spite of decision making being an effort rooted in the human condition. As in the case of most sciences, the analytical toolkit of decision scientists is mathematics. Generally, decision scientists have not examined the vast body of works of literary titans that pertain to decision making. The works of just a handful of writers are sufficient to point to the relevancy of literary works to the study of decision making processes: Joseph Conrad's novel *Lord Jim*; Robert Frost's poem *The Road Not Taken*; Ernest Hemingway's short story *Hills like White Elephants*; London School of Economics cofounder George Bernard Shaw's play *Pygmalion*; William Shakespeare's plays *Hamlet*, *Julius Caesar*, and *The Merchant of Venice*; and so on. In *Lord Jim*, Conrad described the instinctive, but momentous, action by the novel's eponym to jump the ship, *Patna*, at a critical juncture, and spends the rest

of the story explaining the subsequent choices triggered by that one action, and the final, fatal consequence. Frost's poem attempts a scientific approach, but finally admits that the role played by the 'leap of judgement' is not easily analysed. However, he does so not without leaving clues for further analysis. Hemingway examines the complexity of making joint decisions in the absence of a window into the heart of decision makers. Shaw's Professor Higgins places great confidence on the ability of science-based training to mould individual behaviour, but is defeated and, at the same time, enriched by emotions and sentiments. Shakespeare understood the complexity of decision making and effectively used decision analysis in various settings, be it Hamlet pondering suicide, Brutus contemplating his participation in the assassination of Julius Caesar, or Portia defending the Venetian merchant Antonio in the court of law and saving his life.

This article begins with a review of some of the important theories and frameworks of decision making—their limitations, too, will be briefly explored. This will focus the discussion on the nature and limitations of human judgement, which plays a critical role in decision making. There are advantages to be gained from efforts to overcome the limitations of decision making theories through the study of human judgement, and from aiding human judgement through the application of theories of decision making. If bounded by demands of rationality, a linkage between the mathematical, deductive application of decision theories and the subjective, intuitive approach of judgement is often a major challenge. To address issues that go beyond rationality, this article will draw illustrative attention to specific works by Robert Frost (2002) and Ernest Hemingway (1997) to the study of decision making. Decision models will be discerned in Frost's and Hemingway's works, and how they address the limitations of the traditional models and theories will be examined. Finally, Frost's and Hemingway's works will be integrated to yield a model of joint decision making process of two or more people, as a first step toward the study of organisational decision making.

A brief review of theories of decision making

While economists might seek to help managers achieve better business outcomes, a number of other disciplines have also been interested in aspects of decision making. For instance, philosophers seek to understand what decisions reveal about individual and societal values. Historians seek to understand the choices made at defining moments in time. Psychologists hope to understand human behaviour and the functioning of the mind. Mathematicians, logicians, sociologists, political scientists, and a number of other disciplinarians too have their reasons to dissect and examine the decision making process. Generally, however, they all seek to either extend the limits of rationality in the decision

making process or, at least, understand how the process deviates from rationality. The works of these scholars have resulted in literature being replete with a variety of models and theories of decision making. Modes of decision making are described variously. Some of the descriptors include: strategic, rational, satisficing, incremental, optimising, judgemental, subjective, intuitive, behavioural, and so on. This diversity of terms suggests underlying philosophical differences among the models and theories of decision making.

In his book, *The Functions of the Executive*, Chester Barnard (1938) recognised that the functionality of the corporate manager was not derived only from the manager's intuitive orientations, but from the organisational systems that defined the operation of the corporation. In his conception of a company, flow of information was critical to decision making. Barnard was one of the first to describe decision making as a function of a corporate executive. His description brought focus on the responsibilities of bringing deliberations to their logical end, allocating resources accordingly, and implementing specific actions. Resource allocation became the central interest of the emergent models and theories of decision making.

Decision models are simplified representations of the decision making process. Decision theories are explanations of that process. Included among the various theories are *decision theory* and *multiple attribute utility theory* (Raiffa 1997; Köksalan, Wallenius, and Zionts 2011); *behavioural decision theory* (Edwards 1954, 1961; Weiss and Weiss 2008); *psychological decision theory* (Kahneman and Tversky 1979; McDermott, Fowler, and Smirnov 2008); the *Delphi technique* (Linstone and Turoff 1975; Adler and Ziglio 1996); *social judgement theory* (Hammond et al. 1975; Cooksey 1996); *analytic hierarchy process* (Saaty 2008); *attribution theory* (Heider 1958; Harvey and Weary 1985); and *information integration theory* (Anderson 1981). The next section reviews the limitations in their range of applicability.

Limitations of decision analysis

Individual decision making is fundamental to organisational decision making. Much of the research on individual decision making process has drawn from the decision analysis literature. This is especially true for studies in clinical judgement and medical decision making. Yet, evidence that individuals utilise decision analysis when making decisions is scant. Individual decisions of import are often made under time pressure, with limited time available for research.

As stated earlier, the various theories and models strive to extend the rationality of decisions. Yet, these models have generated considerable controversy. The question central to the controversy is what constitutes rational decision making and

whether this is better achieved through intuitive rather than mathematical techniques (see Polister 1981; Shaban 2005). Questions remain, for instance, about the validity and applicability of multiple attribute utility theory. These include what procedures should be used for the assessment of utilities and their functions; whether weights should be assigned through direct elicitation or inferred indirectly through observations; when and where can the theory be applied; and how to validate the theory. Kahneman and Tversky (1979) reported significant departures from behaviour predicted by the maximisation of expected utility. In his 1978 Nobel Memorial Lecture, Simon (1979: 507) stated '[i]t is not that people do not go through the calculations that would be required to reach the SEU [subjective expected utility] decision—neoclassical thought has never claimed that they did. What has been shown is that they do not even behave as if they had carried out those calculations, and that result is a direct refutation of the neoclassical assumptions.'

The critics of mathematical, deductive methods such as decision analysis suggest that such methods may lead to oversimplifications, cause errors, and introduce biases of their own. For instance, such methods assume that objectives are fixed and constant, the problem at hand is independent of time, payoffs are measurable and quantifiable, and the problem can be described as a closed system (Harrison 1981). In fact, not only do utility scales differ from person to person, they also change for the same person with experience and over time. For a complete analysis of decision, the problem of interest needs to be broken down into its component elements or parts. In so doing, some relevant variables may not be identified, and the interrelationships may be overlooked. This risk can be considerable and stakes enormous—as, for instance, in the case of medical decision problems. Emerging technologies confront medical professionals and patients alike with unique, complex, and previously unseen situations. These situations do not always lend themselves to mathematical, decision analysis methods, for various reasons. For instance, it may be difficult to construct a decision tree for a specific situation. Or, even with a decision tree constructed, it may be difficult to obtain meaningful probabilities for possible outcomes. In fact, outcomes may not even be known and may be difficult to anticipate. Such problems may require exercise of judgement.

Few would argue the important role played by human judgement in top management decision making. However, the main argument in favour of the use of decision analysis methods is that intuitive decision making capabilities of individuals are limited. Studies on the process of human judgement have demonstrated these limitations (Cooksey 1996)—their nature is reviewed in the next section.

Limitations of human judgement

Cooksey (1996) demonstrated that, unaided, decision makers have difficulty in using all the information available to them. Memory was also cited as a limitation, though a computer-based reminder system can significantly reduce such drawbacks. On the other hand, Goldberg (1970) indicated that intuitive judgements are not always inferior to the predictions through formal, analytical models. Kahneman and Klein (2009) reported that, under certain conditions, predictions based on consensus within a group of decision makers can do as well as, if not better than, predictions of formal, analytical models. Also, consensus among experts was seen to improve precision and reduce errors associated with assessment by individuals (Novotný and Raková 2010).

Hungarian psychologist Egon Brunswik described human judgement as a process through which an individual uses social information to make decisions (Hammond et al. 1975; Cooksey 1996; Hammond and Stewart 2001). Such information is obtained from an individual's environment, and is interpreted through the individual's 'cognitive image' of the environment. The cognitive image provides a representation of the environment based on past experiences and training, and essentially predisposes the person to respond to social information in more or less predictable ways. Human judgements are then based upon one's biased interpretation of available information. Therefore, one's judgements may be considered as probabilistic statements about one's environment and how one reacts to it. Understanding the limitations of this process requires examination of its characteristics.

The human judgement process has three fundamental characteristics. It is covert, inaccurately reported, and inconsistent (Hammond et al. 1975; Cooksey 1996). *Covertness* refers to the subjective nature of the judgement. It is seldom possible for an individual to describe his or her judgement process accurately. Usually, the only means of 'uncovering' and 'explaining' judgements are introspection or guessing at the reasons for the observed judgement. *Inaccurate reporting* refers to such explanations being incomplete. This is not due to evil intent of misleading the observer, but rather to fallibility of subjective reporting. *Inconsistency* is observed when identical circumstances do not result in identical judgements. Judgement being a covert process, not explicitly observed by both a person making the judgement and an observer, it often results in different outcomes at different times. When judgements made by one individual are noticed by another, the observer may conclude that the individual making judgements is either incompetent or has hidden motives. Motivational explanations have assumed that the individuals' inconsistencies arise from their self-serving behaviour. However, the psychological theory of human judgement described by Brunswik (see Hammond et al. 1975; Cooksey 1996) finds such assumption unnecessary. Human

judgement is inconsistent because it is not a fully analytical and controlled process—therefore, inconsistency is an inherent characteristic.

The limitations of the judgement process offer potential for misunderstanding, mistrust, and conflict among decision makers. Social judgement theory (Hammond et al. 1975; Cooksey 1996), which evolved from Brunswik's work (see Hammond and Stewart 2001), contends that disagreements may flow from mere exercise of judgement. Consequently, an aid to judgement must make explicit the parameters of human judgement and the components of disagreement. Social judgement theory explores these parameters by posing five questions (Cooksey 1996). (1) What is the *criterion* of the judgement? In other words, what is being judged? (2) What *factors* influence judgements? Or, what are the factors considered by the individual making judgements? (3) What relative *emphasis* does the individual put on each of the factors? When using information on factors considered, the individual attaches various weights to these factors. Different individuals are likely to attach different weights to the factors. (4) How does the individual *integrate* the information regarding each factor to arrive at an overall judgement? This involves identification of the mathematical relationship which describes the dependence of the overall judgement on the factors considered. The relationship between each factor and the overall judgement may be linear or non-linear, and the contribution of each factor to the overall judgement may be positive or negative. (5) What is the *consistency* with which the individual is able to make judgements? An individual may make different judgements about the same situation on different occasions. A major cause of inaccuracy in unaided exercise of judgement is that individuals are seldom aware of the specific weights and functional relationships they employ with respect to the various factors.

With both—mathematical, deductive approach to analysing decisions and empirical, inductive approach to understanding the intuitive processes of human judgement—being limited in their own way, are there advantages to be had through linking of the two? The next section examines this point.

Need for a linkage

It has been long recognised that limitations of clinical intuition and judgement-based decision making can benefit from formal methods of analysis. For sure, decision aids have long been used to guide decision makers. Generally, however, these efforts have been based either on expectations of rationality or on a degree of understanding of the extent to which human behaviour might deviate from rationality. How might one address aspects of human decision making process that go beyond rationality? It is evident that limitations of formal methods draw attention to the need for intuitive techniques that might assist human judgement.

As stated by Politser (1981: 371), '[t]he two methods seem clearly to need each other, and the time has come for some form of marriage.' Tools have been reported in the literature which aid linking of formal methods with intuitive methods. For instance, Hammond, Mumpower, and Smith (1977) described a symmetrical linkage system based on social judgement theory that connected a model of a cognitive system based on value judgements to a model of an environmental system based on technical facts. Difficulties encountered in such efforts have also been reported (Andersen and Rohrbaugh 1992). Dhir (2001) used the symmetrical linkage system to link an environmental model to the cognitive models of the top management of a corporation. A major advantage revealed by these studies is that linking mathematical, operations research models with cognitive models enables decision makers to carefully identify and re-evaluate their underlying assumptions and important factors in a decision problem.

The various models of decision making discussed above can be of assistance to a decision maker to the extent that they can be benchmarked against rationality. However, they do not prove helpful in all cases. When the decision process is irrational, new models and theories may be required. One such attempt is presented in the next section.

Beyond rationality

Chamberlain (1968: 37) stated, '[s]trategic decisions rest on the use of judgment. The nature of nonlogical process on the strength of which final choice rests is not easily specified. It is the ingredient which business sometimes identify as "seat-of-the-pants" thinking, to distinguish it from the cerebral variety. It is sometimes referred to as intuition, sometimes as a "gut feeling." It probably includes a considerable amount of experience [. . .] to give one a sense of confidence in being able to make a "right" or a satisfactory choice or nerve to make some choice and face the consequences.' In Preface to *Lyrical Ballads*, William Wordsworth (2009: 21) wrote, '[i]f the time should ever come when what is now called science, thus familiarized to men, shall be ready to put on, as it were, a form of flesh and blood, the poet will lend his divine spirit to aid the transfiguration, and will welcome the being thus produced, as a dear and genuine inmate of the household of man.'

Marks (1971, 1977) suggested that decision problems that lend themselves to a fully rational analysis are likely to be handled at the relatively lower levels of an organisation. He contended that top management must cope with decision problems that are beyond the realm of fully rational analysis and require exercise of judgement. Of course, the approaches based on mathematical, deductive and empirical, inductive methods described above utilise methodologies implying

rational analysis. Marks encouraged comparison of alternative means of analysis and suggested examination of works of thinkers whose business begins at the limits of rationality, such as poets and preachers. He presented an interesting analysis of Frost's poem, *The Road Not Taken* (Marks 1971; Frost 2002), and Hemingway's work, *Hills like White Elephants* (Marks 1977; Hemingway 1997).

Two decades before Chester Barnard (1938) wrote his famed book, Robert Frost was well placed to examine the nature of decision making. He had extraordinary command of the use of metaphors and also functional comprehension of science. He regularly penned down his thoughts on astronomy, botany, education, geology, literature, philosophy, physics, politics, psychology, and religion. He had the capability of bringing the spiritual and the physical together. He wrote in his notebook, corrections included, '[s]cience is nothing but practical experience carried to a greater extent. It ~~lengthens~~ pushes knowledge from miles to light years. It teaches us on the job what is passable in material strength {speed} speed and finish, what is sufficient to do and think. It teaches us to forget sentiment not to worry {or be anxious} about sentiment nor ~~and~~ about God who is the King of sentiment. Science teaches us how much less ~~that~~ than all this is possible to get along on' (Faggen 2007). In 1916, he wrote *The Road Not Taken*.

Frost's inside view of individual decision making

Marks (1971: 59) described Frost's poem as providing an 'inside view of a moment of decision'. He stated, 'it confronts the very matter that students of scientific management stay clear of'. The poet has difficulty in determining which of two roads had been less travelled by. Yet, the poet appears to believe that decision making is a rational process in which facts are important. Facts obtained by the poet do not clearly indicate the ideal choice. He first notes that the road he chose was 'just as fair' as the one he did not. But, then, he tentatively submits that the one he chose has 'perhaps the better claim'. Then, he quickly backtracks, reverting to the original stand, and notes that both roads have been worn 'about the same'. Nevertheless, the poet decides 'to claim publicly that the facts had clearly shown one of the two roads to be less traveled and that was the one he had taken' (Marks 1971: 60). There is no evidence to support such a claim. Yet, the poet asserts his final decision. 'To be sure, many decisions in life can be made and explained rationally. For many kinds of problems some answers are better than others, and the great hope of scientific management is that the number of these will be increased [. . . .] But many decisions in life cannot be made rationally—not in the sense that they can be made and explained so that everyone would agree on the same choice. These are the decisions with which executives must deal' (Marks 1971: 60–l). In Frost's poem, the dramatic moment of decision is apparent. It

occurs at the hyphen in the last stanza, when the poet takes a 'leap of judgment, a leap beyond facts and beyond logic' (Marks 1971: 61).

In certain ways, it is easier to study organisational decision process *in vivo*, than individual human decision making. As stated before, Frost's decision model describes the *inside view* of the moment an individual's decision is made. Is it a valid view? How do we know what the process is inside one's head? It cannot be directly observed. The process is covert. If reports of human judgement are flawed, as discussed above, would not the poet's self-reporting of what happened in his own mind be faulty too? To make this inside view explicit, it may be profitable to investigate the dynamics of two individuals attempting to arrive at a joint decision.

Hemingway's two-person decision process

Two persons attempting to arrive at a joint decision would yield an opportunity for direct observation of the decision process. In an organisation, decision making is shaped not only by what goes on inside an individual's mind, but also by the social interactions among individuals. To the extent that organisational decisions are joint decisions, it would be logical to study the organisational decision process through investigation of two-person decision process. Ernest Hemingway's (1997) short story, *Hills like White Elephants*, offers such an opportunity. The story is set at the railroad station in the Ebro River Valley of Spain. Two persons, a man and a woman, are conversing intensely while awaiting a train that is to come from Barcelona and head for Madrid. The woman is pregnant, and, apparently, not married. The two are exploring the decision to abort the pregnancy. The abortion would be performed in Madrid. Both persons are tense, and their hearts are heavy. This becomes evident very early in the story. They have already come to the railroad station. Evidently, the journey to Madrid has begun. However, they have not yet achieved joint commitment to the decision to abort the pregnancy. The man tries to get the woman to give her full assent to the operation. 'It's really an awfully simple operation, Jig,' the man says. Yet, he adds, 'if you don't want to you don't have to. I wouldn't have you do it if you didn't want to.' And, again, he states, 'But I know it's perfectly simple.' The woman, on the other hand, tries to get the man to state clearly that he wants her to go through with the abortion. Both avoid the responsibility of the decision. The tension mounts as the discussion continues without resolution. Both parties try to cope with the situation in different ways. The man is persistent in his effort to shift the responsibility to her, 'you've got to realize'. At last, she says, 'Would you please please please please please please please stop talking?' She threatens to scream. Just about then the waitress shows up and informs them that the train would be arriving in five minutes. The man says, 'I'd better take the bags over to the other side of the station.' Even with

some time left at hand, the man wants to take the bags to where the train would come. The woman smiles at him and says, 'All right. Then come back and we'll finish the beer.' Apparently, there is enough time to finish the beer. Yet, the bags are being given priority. Marks (1977: 382) described this moment as the one when the 'decision already made is remade'. At this moment, the decision of the man becomes *explicit*.

A number of elements are discerned in Hemingway's story characterising the two-person decision process. There are facts of the case. These facts are gathered from various sources. 'It's really an awfully simple operation, Jig.' The man repeats this information several times. The man offers more information, 'I'll go with you and I'll stay with you all the time. They just let the air in and then it's all perfectly natural.' The man says, 'I have known lots of people that have done it,' and the woman replies, 'And afterwards they were all so happy.' The experience of others is a source of information. However, did they survey those among their acquaintances who had had abortions? Was it fact that those who had had abortions were 'all so happy'? There are apparently additional sources of information. They are not necessarily tested out for validity. The woman makes a point in the story by saying simply, 'I just know things.' Similarly, the man says earlier in the conversation, 'We will be fine afterward. Just like we were before.'

There are additional elements present in the two-person decision making process as described by Hemingway (Marks 1977). There is the matter of wanting to go through with the abortion. The man says, 'If you don't want to you don't have to. I wouldn't have you do it if you didn't want to.' The woman responds with, 'And you really want to?' He replies, 'I think it's the best thing to do. But I don't want you to do it if you don't really want to.' The man is apparently saying that he will not be held responsible for the decision. She should take the responsibility for the decision herself. She should not blame him, later, should things turn out different from the desired outcome.

The woman tests him out. She says, 'And if I do it you'll be happy and things will be like they were and you'll love me?' He could say, 'Yes,' at this point, and no further discussion would be required. Instead, he dodges the question with, 'I love you now. You know I love you.' And the discussion continues. The woman counters with, 'Then I'll do it. Because I don't care about me.' The man reads an accusation in that. Instead of being pleased with the statement, he says, 'What do you mean?' Again, the discussion continues. When she says, 'And I'll do it and then everything will be fine,' the man replies, 'I don't want you to do it if you feel that way.' Marks (1977: 391) described this dialogue as 'trans-rational' and stated, 'Hemingway points to a dimension of human experience which is not so much opposed to reason as it is beyond reason.' Marks (1977: 391) referred to this dimension as the 'sound of sense', explaining that 'decisions turn finally on words but also on their timing and tone, on meanings which reside in the quality and

manner in which words are enunciated as well as in the silences which surround them'.

Another element that can be identified in this story is that of silence. Just as the conversation begins to explore a difficult subject, the woman breaks away from it, looks at the bead curtain, and says about it, 'They've painted something on it. What does it say?' 'Anis del Toro. It's a drink,' he replies. This is the silence. In breaking away from a difficult argument, the woman has conveyed to the man how she feels about the main topic of the conversation. She discussed the bead curtain. Yet, she said nothing directly about the subject. This is the 'sound of silence'. Similarly, tasting the drink they had ordered, she says, 'Everything tastes licorice. Especially all the things you've waited so long for, like absinthe.' She gets the desired effect. The man gets impatient. 'Oh, cut it out,' he says.

The last element identified by Marks (1977) is the remaking of the decision. In Hemingway's two-person decision model it is possible to identify the moment at which both persons recognise that the decision has already been made. Neither acknowledges this recognition verbally. The key moment is nonverbal. The man takes charge of the bags, and of their relationship. The woman asks him—with a smile—to come back and finish his beer.

Frost's poem is illustrative of a single-person decision process and Hemingway's short story is illustrative of a two-person decision process. The obvious question that arises is whether Frost's inside view of decision making can be integrated with Hemingway's outside view of two individuals attempting to arrive at a joint decision. The next section attempts to answer this question.

Integrating Frost's and Hemingway's models

While Marks (1971; 1977) described Frost's and Hemingway's decision models, he stopped short of integrating them. A close examination of both these processes may offer clues for the organisational decision process. For instance, does Hemingway describe what factors come to play in the decision process when a single decision maker, described by Frost, must accommodate a second person who is also making a decision of common interest?

Frost's poem contains many of the problem solving elements familiar to decision theorists: definition of the problem, collection of data, assessment of uncertainty, assessment of opportunity cost, application of the criterion of choice at the decision point, and the responsibility of the decision maker for the consequences. These concepts are quite familiar to those acquainted with the typical operations research / management science techniques. The problem is that there are two diverging roads, and the traveller wants to travel both at the same time, but cannot. The poet stands observing at the fork in the road for a long time.

He looks down them as far as possible, collecting data. He experiences uncertainty in regard to the 'claim' of each and knows that the opportunity cost of his decision is that he may not have another chance. Finally, an objective criterion is presented, it being the road 'less traveled by'. The application of this criterion is not necessarily consistent. The poet has difficulty in obtaining hard facts.

Moreover, the moment of decision is apparent in Frost's model. It occurs at the hyphen, at which point the poet takes a leap of judgement, beyond facts and logic. Unpredictability and uncertainty exist because the decisions involved here relate to unique events which are to occur in the future, and which are subject to unknown circumstances. Chamberlain (1968: 34) stated that, in such cases, '[e]vent stands independent and isolated, with no calculable odds of success or failure. Nor can the uncertainty be overcome by the acquiring of additional data. Although further information may improve the decision, and to that extent reduce uncertainty, there must always remain a class of facts which can only be expected or guessed at.'

The elements of problem solving described above differ in terms of the sources of knowledge implicit in them. After all, data collection is a search for facts about the problem at hand. Assessment of uncertainty in the decision analysis approach may call for contemplation of both facts and evidence on hand, as in the case of developing hypotheses to define the problem of interest, describing solutions or goals in terms of future states, and proposing hypotheses to 'connect' alternatives to consequences. Finally, the formulation of criterion and the leap of judgement at the decision point are grounded in the cumulative knowledge possessed by the decision maker, and rely on intuitive analysis. The criterion is formulated and the leap is guided by the accumulated facts, evidence, and perceptions. Frost suggested that facts, evidence, and perceptions are all appropriate sources of knowledge to arrive at decisions. The importance of information in the decision making process is recognised by Frost. However, just how this information shaped the poet's decision is unclear. The facts are ambiguous. Which was the less travelled road, in fact? Or were they both equally travelled? With ambiguous facts, how did the poet process them? Of course, the leap of judgement, the moment of decision, occurs within the decision maker's head, and the covert process that guides it cannot be directly observed.

In the Hemingway model, both individuals in the story, the man and the woman, gather information through facts known to them, evidence from their own and other people's experience, and their own perceptions, interpretations, and judgements. In this respect, the Hemingway model is not different from the Frost model. However, information pertaining to the trans-rational aspects of the decision is exchanged in the Hemingway decision model through other means too. Silence plays an important role in uncovering information pertaining to emotional dimensions. Meaning is ascribed to silence through its location in the discussion, that is, through what is said or done just before and just after the moment of

silence. Similarly, the sound of sense is instrumental in the exchange of information through interpretation. It allows information to be conveyed beyond literal meaning of words, and its realm goes beyond facts, experience, and perceptions—beyond rationality. It includes relevant information on emotions, values, beliefs, and ideologies.

While in Frost's model there was a clear moment of decision, no such moment is discernible in the Hemingway model. It is not clear at what point in their discussion did the individuals make their own respective 'leap of judgment, a leap beyond facts and beyond logic' (Marks 1971: 61). Their journey to Madrid had begun already, when they set out for the railroad station. However, neither party had acknowledged their respective commitment to the journey, possibly even to themselves. The leap of judgement could have been made by either or both before the two persons arrived at the railroad station. However, even in that case, neither party knew that the other had already made the leap of judgement. If one had been aware that the leap of judgement had already been taken by the other, then there would not have been the need to explore each other through discussions. Commitment to the decision on part of either party was not apparent to the other. So, they came to the railroad station, still tentative about the future course of their actions.

Hemingway suggests that the prerequisite to joint action is the recognition that a decision has been made, in fact, already. However, according to Frost's decision model, action by an individual is possible only after the individual has already made the leap of judgement. It follows that for joint action among a set of individuals, each of the interested parties must make their respective leap of judgement. Recognition of a decision already made, then, may be described as the realisation on the part of each individual that all other parties involved have made their respective leaps of judgement. This model may now be extended to a group of individuals. Joint action among a number of individuals would be possible *after* each individual has recognised that *all* members of the group have made their respective leaps of judgement. The implication for organisations is that they should foster an environment of openness to facilitate easy *recognition* and *analysis* of information, to facilitate earlier leaps, and transparency of individual decision making process, to aid the leaps.

Frost's and Hemingway's representations of decision making processes are remarkable, in that they incorporate in a concise manner the findings of numerous studies reported in the literature. They point to the need for coping with uncertainty and ambiguity. Indeed, unstructured decision making situations are characterised by uncertainty, ambiguity, and equivocality. Frost suggested that individuals cope with uncertainty by making the leap of judgement. The uncertainty is not removed prior to the leap—'[o]n the contrary [. . . ,] he cannot remove uncertainty except by making his leap' (Marks 1971: 61). Hemingway

pointed to sources of information—sound of sense, for example, and information contained in silence—not addressed by traditional decision theories. He implied that in the face of uncertainty and ambiguity, individuals involved in group decision making seek to remake decisions or seek recognition of the decision that has already been made. Neither Frost nor Hemingway addressed the issue of validity of decisions, although Frost (2002: 105) acknowledged the consequence of the decision, concluding, '[a]nd that has made all the difference.'

Summary

This article reviewed some of the important theories and frameworks of decision making and discussed their limitations. It also reviewed the nature and limitations of human judgement, and the role of human judgement in decision making. This article argued that there are advantages to linking the mathematical, deductive approaches of prevailing decision theories to the empirical, inductive approaches deployed in the study of subjective human judgement processes. It suggested that the challenge posed by decision making going beyond rationality might be addressed through the works of literary titans. To offer examples that illustrate this point, this article discussed the works of Robert Frost (2002) and Ernest Hemingway (1997). Decision models were discerned in Frost's and Hemingway's works that can be applied to the study of individual and organisational decision making processes, respectively. The integration of the two models offered insights into the process of joint decision making by two individuals that can be extended to organisational decision making.

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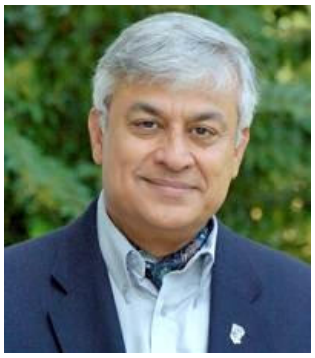

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