Behavioral strategy: a foundational view

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Abstract

Purpose – The purpose of this paper is to apply the cognitive research of Herbert Simon to business strategy decisions, to begin a discussion of the emerging field of Behavioral Strategy.

Design/methodology/approach – Research on cognition, memory and expertise are organized, with the aim of enlightening the process of business strategy development.

Findings – The authors select four insights from Simon's work to form an integrative framework of decision making and apply this to illuminate existing approaches to schools of strategy thought and practice.

Research limitations/implications – This paper should lead to research on how to advance the process of solving strategic problems, in both practice and theory. The most important limitation is that much additional research lies ahead, as this is a foundational view.

Originality/value – This paper is the first to recognize the potential for application of Simon's cognitive research to the practice of strategic decisions.

Keywords Cognition, Memory, Expertise, Research work, Decision making, Strategy, Behavioural strategy, Human cognition, Domain expertise, Managerial psychology

Paper type Conceptual paper

Introduction

Decisions are the cornerstone of strategy, and, as such, strategy decisions form a set of the most important choices managers make about their enterprises. These selections define what markets the firm will serve, how the organization will produce and deliver products and/or services, and how to best organize in the face of ever-changing markets, technologies, and competitors. Strategy decisions are by definition of paramount importance to the success or failure of the organization. By nature, they are not routine. Our intriguing questions are: how do executives formulate strategy decisions? And how can we better teach aspiring strategists to become proficient at this task?

Behavioral economics and behavioral finance have at their root the concept of bounded rationality, which posits that the bases for decisions are different from those hypothesized by the rational choice model. We link the emerging field of behavioral strategy to experiment-based generalizations from Simon's research in human cognition and artificial intelligence. This review of the underpinnings of behavioral strategy includes considerations of both experimental studies and observational indications, concentrating on integrating the cognition research into the beginnings of a theory on how individuals create strategy decisions.

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The broad scope of this endeavor will lead us to bring together concepts from such diverse fields as behavioral economics, cognitive psychology (studies of memory, judgment, decision making, and conditioning), and artificial intelligence (case-based reasoning, heuristics, and pattern recognition). We select from this literature only those concepts with greatest bearing on our thesis.

Classical decision-making theory and bounded rationality

The theoretical backdrop for the commonly used normative model which underlies economic and psychological research, classical decision making (CDM), is the “rational choice” model. CDM postulates the formation of a utility function and a subjective probability distribution, with subsequent maximization of subjective expected utility (Von Neumann and Morgenstern, 1944; Savage, 1954). One significant outgrowth of this axiomatization was the development of business school courses featuring the decision tree approach to optimal strategy determination (see Pratt et al., 1965; Schlaifer, 1959, 1961, 1967).

In a series of ingenious experiments Kahneman, Tversky, and others have shown that people do not conform to the “reasonably sounding” postulates that underlie CDM (e.g. Kahneman et al., 1982). The response from the advocates of the rational choice model was that the experimental subjects needed training to correct their logically inconsistent ways, after which their decision processes would be consistent with the model. One practical application was the publication of Decision Traps (Russo and Schoemaker, 1989). See also the attempt by Gigerenzer and Hoffrage (1995) to train people in Bayesian probability computations.

This call for training is analogous to one’s countering the “irrational” response to the famous Muller-Lyer illusion (see Figure 1). This puzzle can be solved with the admonition to train oneself to use a caliper to compare the lines, yet few of us would do so. As the evidence from the various “decision bias” experiments accumulated, some economists abandoned the rational choice model and began developing a new foundation for choice.

In Simon’s (1955) concept of “bounded rationality”, he noted that the normative model requires an elicitation of each possible action as well as a consideration of all possible intermediate events and contingencies. Simon recognized that it is beyond human mental capacity to enumerate, let alone keep in mind, all this required data. He postulated that the decision maker looks only at a manageable subset of these actions, events, and contingencies in the formulation of his choice. Simon replaced this maximization task with a less onerous task, “satisficing,” namely finding a choice which satisfies some minimum desired utility level (Simon, 1957).

Decision making is a practical, not theoretical, exercise, often with an associated sense of urgency and immediacy. By the time one lists all the possible actions,
intermediate events, and contingencies, along with their probabilities, puts them into a decision tree, and calculates the optimal choice, the time to act may be long gone. As noted by military strategists, “no battle plan survives first contact with the enemy.”

A foundation for behavioral strategy
Simon's pioneering work led to the emergence of behavioral economics (see Rabin, 1998; DellaVigna, 2009), and has been applied to investment decisions resulting in the emergence of behavioral finance (see Barberis and Thaler, 2003). Bromiley (2005) has noted the significant benefits which arise from applying the behavioral foundations of Simon, March, and Cyert to strategy research.

The editors of the December 2011 special issue of the *Strategic Management Journal* (on the psychological foundations of strategic management) cast a wide net for the field, encompassing topics such as collective behavior, complex judgments in organizations, and the psychological architecture of the firm (Powell et al., 2011, p. 1372). For this paper, we concentrate only on the topic of individual decision making.

Less familiar to students of business strategy than bounded rationality are the implications of Simon's groundbreaking research on artificial intelligence. Campitelli and Gobet (2010) noted that despite Simon's effort to understand the processes that precipitate human decision making, his work did not have the impact in the “decision making” community that it had in other fields. In their paper they propose the integration of Simon's work with other important approaches to decision making. Specifically, they recommend including what they dub “the expertise approach” into decision-making research. We incorporate this approach into our framework for individual decision making.

Simon's work on expert individual decision making led him to state a series of principles, unfortunately scattered across his many papers on the subject and never linked in an academic paper. Even in his paper directed at aspects of business decision making (Simon, 1987), he did not fully delineate, let alone integrate, these concepts as they apply to this topic.

As Simon conducted his research he made, *inter alia*, four powerful observations that help explain why some have better success solving complex problems than others. We have connected these constructs into an integrative framework of expertise in strategy decision making which forms the structure of our paper. Within a discussion of each we present Simon's work and the work of others to better develop the framework's propositions as we apply these ideas to the manager's strategic decision-making process. Armed with these concepts, we consider how best to approach the teaching of this skill.

Constructing strategy
1. **Representation is key**

We begin with Simon's notion of representation as the key to problem solution (Simon and Simon, 1979; Simon, 1980, 1986; Simon, 1989, pp. 187-9). He noticed that experts see problems differently than novices, the main effect being that experts represent the “problem space” in a special way (Simon and Simon, 1962; Simon and Chase, 1973b; Simon, 1986). A representation contains the salient features needed to solve a problem. It does not provide a solution, but rather sets the stage for an efficient search for the answer.

A representation derives powerful constructs which highlight clues about the nature of the problem. There is extensive psychology literature on the representations created by experts, unfortunately mostly outside of business situations
As noted by Davis et al. (1993), a representation is “used to enable an entity to determine consequences by thinking rather than acting,” and “provides for organizing information so as to facilitate making the recommended inferences” (p. 1). A representation develops a way for the decision maker to limit his or her search to the most important facets of the decision. The decision process starts with a consideration of the salient factors of the problem (i.e. the representation), followed by the determination of which of these factors are important in the instant case. By doing so, the decision maker develops a rapid compilation of “what matters” to solve the immediate problem at hand. Hayes (1989) devoted his opening chapters to examples of how to create “internal” representations of problems, those developed from the problem context. Although this is an interesting set of drills, the book is unfortunately weighted toward the construction of representations for simple puzzles, and does not address the more creative task of constructing representations for more complex decisions problems.

Simon sees a difference between the way experts and novices approach decision making. Following Simon’s lead, Campitelli and Gobet (2010) note evidence indicating the key role that search plays in expert decisions (p. 361). Gavetti and Levinthal (2000) recognized that “cognitive representations” may be considered to be an outline of a possible strategic action, and reported the difference in the representations of experts vs novices in their study of the use of analogy in business situations (p. 117). In his review paper, Levinthal (2011) notes that “(t)o act in a deductive, intentionally rational manner in a complex world inevitably requires the explicit or implicit creation of a representation,” citing the Gavetti and Levinthal (2000) paper as having made this point and in addition, citing the Boston Consulting Group’s (BCG) matrix and the Porter typology as examples of such a representation. We will use both the BCG and Porter approaches as examples of how representations set the stage for efficient search by experts, but begin with a less complex example than the difficult choices posed by questions of business strategy.

One simple example of the power of a crisp representation goes back to high school geometry. Suppose our problem is to establish the congruence of two triangles. Admittedly, this “strategic problem” is merely a simple “puzzle” without the aspects of multi-moves, dedicated and thoughtful competition, and random exogenous events that characterize the setting of business strategy. But it serves to illustrate the concept of representation. For the purpose of establishing congruence, a triangle can be represented by the measure of the lengths of its sides and the sizes of its angles. Other aspects of the triangle, such as its area or perimeter, are irrelevant for establishing congruency. This representation provides a powerful starting point for the process of solving this problem. Without this representation we are left to a trial and error search to develop our solution, testing each of the many possible constructs (e.g. perimeter, area, length of sides, size of angles, and the various combinations of these elements) to find a solution. Once armed with the representation that only angles and sides matter, the proof can be directly developed.

Another example of representation closer to the setting of business strategy is taken from chess. As a multi-move game against an opponent, it is far more complex than our geometry example. Master chess players (and computer chess programs) use some or all of the following seven factors to represent the current status of a game: piece strength (also known as “material”), king safety, piece mobility, pawn structure, maneuverable space, center control, and threats. The order of importance of these factors varies throughout a game. In chess, one decides which combination of the seven
factors is most important in the situation at hand, and then proceeds to look within those areas. This allows for dramatically lowered search time when looking for a solution. Without this representation, chess players face difficulty when winnowing the best moves from thousands of possibilities.

This same process applies directly to business strategy decisions as well. Two examples to illustrate the role of representations as the underpinning of an approach to business strategy are the BCG growth-share matrix and the Porter approach to business strategy. The underlying constructs in the BCG approach are the market share and growth rate of each of the firm’s various products or businesses. Each division within the firm is placed into one of four categories (stars, dogs, cash cows, and question marks) based on its position on the two constructs (Porter, 1980, p. 362). This method’s representation places these two variables as key determinants driving over-all value gains for the firm. The Porter approach posits “five forces” (threat of new entrants, power of suppliers, power of customers, threat of substitute products, intensity of rivalry among firms), so the firm’s “position” within the industry can be developed and a search for possible strategic choices begun (Porter, 1980). Representations need not be so general; they can be industry specific, as in the Spender (1989) study of the British cast-iron foundry industry, which we review below.

Gary Klein (1998) studies expert decision makers in the field. When watching firefighters, he considers how they make critical decisions. Although we have not seen in Klein’s discussion a general representation for firefighters, by applying our lens we posit that a firefighter’s representation includes factors such as possible loss of civilian life, possible loss of firefighters’ lives, and loss of property. Just as described for chess players, firefighters scan through the factors to determine which are most salient in the instant case prior to searching for potential solutions for the decision at hand.

Unlike the situation in chess, where an adequate representation has been developed, there may be no “one size fits all” representation one can learn and apply to business strategy. An example is noted in Mintzberg et al. (1998) where ten “schools” of strategy are developed, each with a different representation. One may take one of the extant representations, see if it fits, and if so apply it; or one may be required to develop one’s own representation to affect a solution.

It is at this juncture in the process that the observation that “expertise is domain-specific” comes into play, because the establishment of the appropriate representation requires knowledge about the specific problem at hand. What is an appropriate representation for the strategic decisions of airline executives may be quite different from that for CEOs in consumer goods companies.

Although understanding the representation of the problem is the beginning of obtaining the solution, Simon noted that an understanding of the representation can be easily overlooked when solving problems with which we are familiar. This is because once we know the solution we may retain it – as it allows for the direct solution of the problem – but forget the representation. This minimizes our mental storage needs but removes our ability to reflect on the process of problem solution, one that relied so heavily on a proper representation, as we attempt to solve new problems.

As an example, when you thought about the solution to the congruent triangle puzzle, did you first think about a proof paradigm you could remember, such as side-angle-side, or did you think about the fundamental elements underlying the proof, which is that one must only look at sides and angles? Most tend to jump to recall the solutions they knew from prior experience. This works well if you have previously
solved the problem at hand. But it does not work for complex problems not yet solved, as is so often the case in strategy problems seen in practice.

Often the strategy problems we select for our students challenge them in unfamiliar areas. When solving an unfamiliar problem, we may start by instinctively searching for analogies rather than carefully constructing a representation. Without a thoughtful process for decisions, we grab the nearest answer we can find and propose it as a solution. A representation of the problem displays the most important elements which reflect how the solution will be obtained. These essential elements best allow decision makers to think about the instant problem and efficiently search for the best answers. Yet the representation, although critical, only sets the stage, with the solution taking a prototypical form which we consider next.

2. Experts use patterns
The second element we have selected from Simon’s work is that experts store central insights as patterns (Simon et al., 1980; Simon and Langley, 1981; Simon and Chase, 1973a). While it is probable that patterns can be used directly to solve problems by experts, and we can often recall solutions to problems previously solved, we place patterns second because without a robust representation of a problem, selection from what may be many patterns could become a lengthy matter of trial and error. It is clear that experts obtain solutions far too fast to allow for long search times as a regular part of their routine (Simon et al., 1980).

What Simon dubs representations and patterns are referred to in other literature more generally with terms such as “knowledge structures,” “mental templates,” or “cognitive maps.” In his panoramic overview of managerial and organization cognition, Walsh (1995) defines a knowledge structure as “a mental template that individuals impose on an information environment to give it form and meaning.” Our model proposes an integrative structure to this broad concept of knowledge, based on Simon’s work, to better understand strategy decisions and how best to train those who want to improve.

We see a critical difference between representations and patterns, a distinction that we believe starts an important process in the mind of the expert decision maker as patterns are reviewed in route to a choice. The distinction can be summarized by understanding that representations do not provide a direct solution to the problem. Patterns provide this. But representations enable the expert decision maker to organize and select patterns, so that search can proceed rapidly. Patterns all lead to action, but the novice decision maker has no efficient way to sort the possibilities without a crisp representation as a guide.

Examples will help illuminate this distinction. In our geometry puzzle, the patterns of corresponding side and angle equality combinations used to prove congruency are side-angle-angle, side-side-side, side-angle-side, or angle-side-angle. These and only these patterns of equalities are the basis for solving the congruent triangle problem. As can be seen from this simple example, the patterns stem directly from the representation of the problem, and each leads to a potential solution to the “strategic puzzle.”

To continue in this vein with our chess analogy, we need to characterize the types of patterns associated with the elements in the chess representation. This is not as simple as the patterns used in our geometry example, but to provide a flavor of what is involved, we look at patterns associated with “piece strength.” The novice is taught the basic 1-3-5-9 for pawn-knight-bishop-rook-queen valuation. More advanced players might use a fine-tuned evaluation such as 1-3.25-3.4-5-9.75, and computations may change as the game progresses. Each pattern suggests a strategic direction, a choice.
In the chess game, if you compare your piece strength with that of your competitor and see that you have a big advantage, then you may be well advised to go on the offensive.

The distinction between representations and patterns can best be seen by observing their interplay in chess, which might be considered as a simple analogy to the more complex strategic decision-making process as it takes place in the dynamic environment of the business world. The representation, as given above, is a list of the seven factors. This leads one when making a chess move to consider such questions as: is my king safe? Who has control of the center board? Who has more piece strength? Who has better piece mobility? Does pawn structure matter? Based on answers to these questions, i.e. based on the elements of the representation, one determines which elements are salient for the current decision. One then uses patterns associated with these elements to reach a decision.

Let us look at some examples of patterns, both general and specific, as they have been applied to business strategy. The BCG growth-share matrix provides decisions directly tied to patterns. If you have a star, then invest in it; if you have a dog, then sell it; if you have a cash cow, then take the profits but do not invest in it; and if you have a question mark, then push it up to a star, down to a dog, or sideways to a cash cow, and follow the appropriate decision rule. It is these patterns that lead directly to decisions that made the BCG matrix feel like a breakthrough in its day.

Several of the strategy schools develop distinct patterns to guide decision makers. In Porter’s “five forces,” if suppliers have high bargaining power, then attempt to locate a better source of supply. If the threat of substitute products is high, then try to make your product unique so no other product will meet the needs of consumers.

On a different level of abstraction, one of the most extensive analyses of manager’s “mental templates” was completed by J.-C. Spender (1989) as he developed “industry recipes.” In our terms, his “constructs” were the representation of the problem, revealing that capacity utilization, customer outlook, and technology utilization were key elements in the British cast-iron foundry industry. He noted the following pattern defined top performance: if there was a shortage of specific casting capacity, good long-term prospects for their customers, and active management of the technology of production, then that foundry was more likely to do well even with the over-all decline of the foundry industry. It was this specific pattern the best foundry managers used to make key strategy decisions.

Other research studies find the same approach, search for the ways managers think about decisions (e.g. Barley, 1983; Porac et al., 1989; Reger, 1990; Reger and Huff, 1993; Henry and Pinch, 2002; Hall, 2002; Stubbart and Ramaprasad, 1988). The specialty called “cognitive mapping” may in this light be considered as an attempt at determining patterns in decision makers. The research direction of the cognitive mappers is devoted to the difficult task of discovering methods of eliciting maps, especially from groups. While we find these efforts highly useful, we propose their efforts would benefit from a better understanding of the way managers make decisions beyond mere pattern recognition (see Huff and Jenkins, 2002, p. 174).

The cognitive mapping research highlights a problem when looking only at patterns as the entirety of the “mental map,” i.e. that managers are flooded with numerous patterns. Yet success comes only to those who select the correct patterns. We propose that successful decision makers rely on a robust representation of the problem, even if this representation is often tacit knowledge, i.e. unstated by the decision maker.

Through the mathematical simulation of a series of strategy decisions, Gavetti et al. (2005) provide a look at how managers might arrange and select sets of analogies they
believe will be helpful in making decisions. These ideas are based on the case-based analogy process (e.g. Kolodner, 1993; Leake, 1996). In our integrative model, we see representations as the basis for expert decision makers being able to quickly and efficiently select the patterns (or “analogies”) with the most impact on the decision problem.

The search is still on for a comprehensive representation which can be used for all business strategic decisions. And it may be that, though the representations themselves may be unchanging, the set of extant patterns may not be relevant due to changes in the business environment – e.g. technological breakthroughs, institutional structural changes, or even a previously unencountered strategic move by a competitor. So the collection of patterns is itself a dynamic process.

A factor separate from those listed above that should be dealt with in the development of representations and patterns for strategic decision making is a paradigm for handling uncertainty. The rational choice model includes such a paradigm, namely the elicitation of all possible contingencies and their associated subjective probabilities and the computation of an expected value based on the decision tree incorporating all these contingencies. Given the onerous task of listing all contingencies and their probabilities, others have suggested replacing all the possible uncertain outcomes with one “certainty equivalent” and apply the rational choice model to the resulting tree. Still others, in the spirit of Simon’s concepts of bounded rationality and satisficing, deal with uncertainty by looking at only a subset of the full decision tree and eliminating from consideration low-probability contingencies.

The search for patterns to aid in decisions may be its own end. Thus the Gigerenzer-led research has led to a set of computation devices known as “heuristics” for solving puzzles with a “limited search through objects or cues and exploit environmental structure to yield adaptive decisions” (Gigerenzer et al., 1999, p. 15). Gigerenzer reports a series of studies that show how these simple patterns allow for fast decisions that are also reasonably accurate, and which bypass much of the information commonly thought to be required for a good decision. The decisions in these studies tend to lend themselves to routine processing, rather than the strategy decisions managers face as they shape an organization. Shanteau (1992) notes that in some cases certain “task environments,” such as buying shares on a public stock exchange, preclude most experts from “beating the averages,” making the study of expertise in these domains difficult. This opens the possibility that a simple heuristic may perform as well as a human expert in these situations.

We propose, following Simon’s lead, that patterns provide the grist for strategy decisions, so a search for relevant patterns provides one way that practitioners can improve their skills. But what is the best way to collect, organize, and catalog our exposure to untold thousands of patterns? Exploration of how to develop this skill is central to a further understanding of strategy development. We turn now to the question of how to develop expert decision-making skill.

3. Patterns provide links to aid memory
The third insight we select is that things are best remembered when stored with a link to memory (Simon, 1976; Simon et al., 1980; Simon and Langley, 1981). The link is the
connection which allows the items to be pulled from long-term memory for use. Memory improvement programs routinely attempt to establish a link to data so that it can be easily retrieved. Patterns work to serve as this link to memory.

Simon used his long-term study of chess players to demonstrate this idea and developed the concept of “chunking,” which allowed expert players to see individual pieces on the board as part of a pattern (Simon and Simon, 1962; Simon and Chase, 1973b; Simon et al., 1980). Later researchers indicated that individual chunks may be seen as a series of interconnected chunks (Frey and Adesman, 1976; Chi, 1978; De Groot, 1978), or templates (Gobet, 1997), enabling the decision maker to circumvent the limited short-term memory, far exceeding the “magic number seven plus or minus two” (Miller, 1956). Simon indicates that the expert’s fantastic store-house of chess patterns was not the result of superior memory powers but rather from proper representation of the problem and the development of patterns. Knowledge stored as patterns provide this powerful link to memory.

When tackling the seemingly straightforward project of how to make a computer read a newspaper and communicate “intelligently” about the story, Roger Schank, a later AI researcher, found he had challenges he did not anticipate (Schank, 1990). From this project, Schank became intensely interested in “what we know,” and realized this translates readily into how much and what we are able to remember. He discovered that his computer had to know and call from memory massive amounts of background information just to interpret a simple newspaper story. He also discovered that we do most of this without consciously “thinking” about it. Simon noted the same phenomenon in chess players, i.e. much thinking goes on outside our conscious awareness. We propose it is likely we do the same thing as strategy decisions are developed. We do not often think about our memory, but it is a powerful piece of the strategy decision process. One key issue; what do we tend to remember?

A classic psychology experiment by Frederick C. Bartlett (1932) illuminates what we tend to remember. In this experiment he read a story about ghosts to subjects and later, at various intervals, asked them to recall the story. The story, “The War of the Ghosts,” did not quite make sense to the subjects, as it was based around an American Indian cultural tale that included a ghost and a mysterious death. Of course most subjects did not remember many details, especially if the interval between reading and re-telling the story was long. But the interesting finding was that most had modified the story in their memory so it would make sense, changing or adding facts as needed to allow them to understand and explain what happened and why.

This finding that individuals appear more likely to remember things that make sense to them has powerful implications on what we remember and on how we make decisions. For strategy, this means we need some way to process and tally the wins and losses we see in business every day. Without that, we will have trouble remembering – or making sense – of what we see. Whether we realize it in ourselves or not, we are sense-making beings. We need to be aware of and determine how best to use this innate mechanism to develop better strategy decisions.

Spender (1989) noted the “acid test” of his conclusions on his study of industry recipes is whether the “reader is drawn into the analysis sufficiently for him to accept its conclusions as ‘unremarkable common sense’” (p. 133), taking us again to Bartlett, and that both we as observers along with the experts in this industry seek to make sense of what we see. But Spender importantly notes that just because it all makes sense at the end of the analysis, we must remind ourselves that we began as outsiders, with no apparent way to make sense of the decisions of the foundry managers.
“We tend to forget that the industry once seemed confusing. We see how much the foundry managers depend on their industry recipes […] how much they are able to achieve in a somewhat intractable situation […] and that foundry managers often underestimate themselves and their creative contributions” (p. 134).

How do these lessons retrieved from our memory help us make decisions? Simon indicates that experts store central insights as patterns. Schank posits that we are inherently, unrelentingly pattern-seeking and sense-making creatures, always looking for order in our world so that we can use those patterns we perceive to predict the future. Can we find any scientific traces of this “pattern-seeking” and “prediction” behavior?

One interesting trace is Pavlov’s classic study, in which a dog is conditioned by food to salivate when he hears a bell ring. Schultz (1998) went one step further when he conditioned a monkey with a tone followed by a drop of fruit juice, and discovered “predictive neurons” in the primate brain that fire and send a wave of pleasure after hearing the tone in advance of receipt of a reward. Note that the pleasure occurred prior to the reward, as a prediction of what was to come just ahead. Schultz later changed the experiment by sounding the tone and not delivering the fruit juice and the neurons decreased their firing rate.

The fact that we use patterns for predictions in everyday life has powerful implications and is the reason why we are naturally able to retrieve these lessons for future use. We are “hard-wired” to attempt to predict what will happen next to us, and this is why patterns are so useful for decisions and easy to store and recall.

Each of these insights helps as we attempt to reveal “the mind’s eye” in strategy decisions. The remaining question begins with how Simon viewed the process of becoming an expert decision maker, and how this attainment may affect decision training. It is this process that may prove most beneficial as we plan our efforts to best train decision makers.

4. Plenty of practice
Simon noted the chess expert’s fantastic store-house of chess patterns was not the result of superior memory powers, so the question remains how this skill was developed. We propose that expert strategists make decisions as the result of proper representation of the problem, familiarity with a large number of patterns allowing for the development of links with which to retrieve the patterns, and plenty of practice, as noted in Simon and Chase (1973a, b), and Simon et al. (1980).

Yet studies have shown that experience does not automatically translate into excellence (Ericsson et al., 1993), and we are well aware that human cognition attempts to see patterns where none may exist (Myers, 2002). An understanding of how chess players become grand masters may help us better realize how expertise is developed through practice, and what type of practice is most effective.

When asked how good chess players become better, most readily answer that they play many chess games. But who to play against? For an aspiring expert a game with a novice is of little use, as the two players will be so mismatched that little value will be added to the better player. Great chess players rarely play games against those on the way up, as there is little to gain for the experienced player. So how to master the game?

Chess players seeking to improve their skill replay games previously played between grand masters. By covering the next move in written game records, they “play” against one grand master — and importantly, alongside another. After students make a move, they uncover the actual move the master made and if the student made the same move, they keep playing. If the written record shows a different move, they
study the board to understand why. In this way, over many years of playing against the
written records, they obtain large amounts of practice off line, “against” players of
great skill and being aided by players of great skill. This affords them the time to
closely analyze patterns of play and build their ability before ever facing a live
opponent of significant skill (Ericsson et al., 2006, p. 697). In addition to this “off line”
practice, chess clubs bring budding chess champions together for live matches, and
this is important practice because playing against a human is always different than
against a written record.

These illustrations of how chess players accumulate practice can be expanded to
many areas of expertise in modern life. Your physician cannot practice medicine until
he or she has completed a residency, wherein practice of diagnostic decisions is
provided in real time with real patients under the watchful eyes of senior medical
faculty. The pilot on a commercial airliner hone his or her decision skill by logging
simulator hours. Your plumber, to be a master plumber, must pass muster as an
apprentice working alongside a qualified expert.

These lessons encourage us not to see the field of strategy as a “black box” (as, e.g.
in Mintzberg, 1994; Mintzberg et al., 2005) but as a field of expertise. Our challenge then
becomes how to collect, develop, and organize the patterns needed for strategy.
To build the strategist’s expertise, we first look for the equivalent of the chess student’s
written records of expert games to play against, the hours spent by pilots in the
simulator, the practice afforded residents in medical school, or the apprentice plumber’s
work alongside a journeyman expert. Each of these examples provides a different way
to become proficient in decision making. How many of these can we provide in business
schools? And how can we best prepare our students to most efficiently continue to
improve after they leave the university setting?

In their study of analogy, Gavetti et al. (2005) posit that the “depth and breadth of
the manager’s experience” affects the ability of executives in making strategy decisions
(p. 697). We would call this “practice,” and perhaps the most complete look at the effect
of practice is afforded by Ericsson et al. (2006) which includes studies from numerous
scientists who investigated the nature of expertise in many different fields. Ericsson
et al. (2006) notes that the ideal type of practice is afforded by war games and business
school cases where decisions can be closely studied and evaluated (p. 410). Ericsson
observes that to be an expert, it takes struggle and sacrifice with honest and often
painful self-assessment, over at least a decade, focussing on deliberate practice of tasks
beyond your current abilities, culminating in measurable performance differences, able
to be replicated over time (Ericsson, 2009, pp. 405-31).

We mislead ourselves and our students if we fail to consider the requirement of
expertise needed to be a successful strategist.

**Summary and directions for future research**
The key construct in our approach to strategy is a robust comprehensive
representation of the factors to be considered in making a strategic business
decision. At the theoretical level one should therefore tease out the representations
underlying each approach adduced by strategic generalists, and evaluate them for
their comprehensiveness and robustness. At the pedagogical level one should also
develop ways to train students to make the inductive step of generalizing from their
experiences and creating representations that can be helpful for their strategic issues.
At the empirical level it is worth investigating the types of representations executives
use in making their strategic decision.
The next construct is a set of patterns used by the decision maker in making strategic decisions. Some patterns can be quite general (e.g. the BCG matrix), others industry specific (e.g. those used in the steel industry), still others decision specific (e.g. manufacturing entry in a foreign country). We need more research on the development of these patterns, especially ones tied to broad representations of the strategic problem. We also note the consideration of heuristics as a supplementary decision tool, in particular as a vehicle for selecting the appropriate members of the set of available patterns as the ones to follow through with in developing a strategic solution. This is a rich area for future research.

Developing links to memory to retrieve these patterns rapidly is the third construct in our consideration of business strategy. Perhaps the research into the development and use of cognitive maps in business decision making can be focussed on the creation of such links. Schank proposes that we learn best by failure; perhaps an evaluation of how successful strategy decision makers view previous failures will be a fruitful path to pursue (see Carroll and Mui, 2008) for a step in this direction.

The final construct in our consideration is that of engaging in the right kind of practice. The onus is on case developers to write cases that are useful in building the type of practice advocated by experts such as Ericsson. The series of conferences under the rubric of educational innovation in economics and business occasionally deals with the development of such materials (Gijpselaers et al., 1995). We suggest that one of the future conferences be focussed on the application of the ideas of Simon, Schank, and Ericsson in the creation of innovative materials for business education.

The real proof of the usefulness of our framework will only be seen by its impact on decision makers involved with critical choices in business strategy. As a CEO once told us, “I know my problems all too well, I don’t need to hear them again. What I need is a way to develop a solution, a way to help me find an answer.” We look to the field of behavioral strategy to provide assistance in answering his plea.

**References**


Gigerenzer, G., Todd, P.M. and ABC Research Group (1999), Simple Heuristics that Make Us Smart, Oxford University Press, New York, NY.


Further reading

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