Troubling futures

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TROUBLING FUTURES: SCENARIOS AND SCENARIO PLANNING FOR ORGANIZATIONAL DECISION MAKING

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INTRODUCTION

To thrive, organizations must be equipped to anticipate tomorrow's social, economic, political, and technological advances, thereby ensuring that their products and services do not become outmoded. However, since organizational environments are inherently uncertain, decision makers cannot possibly foretell the future. Rather, they must attempt to devise strategies of sufficient flexibility to enable robust responses to shifting contingencies under turbulent conditions. Many

organizational decision makers turn to scenario planning techniques to help them meet this fundamental goal. In a recent UK survey, over a third of organizations reported using scenario planning in their strategy workshops (Hodgkinson et al. 2006), reinforcing the results of previous surveys demonstrating the popularity of scenario techniques across Western Europe more generally (Malaska 1985) and among large US firms (Linneman and Klein 1983).

Porter (1985: 447) describes scenario planning as “a powerful device for taking account of uncertainty in making strategic choices.” Other popular writings tout scenario planning as a means of developing organizational foresight and facilitating organizational adaptation by boosting learning (Wack 1985a, b; Hamel and Prahalad 1994; van der Heijden 1996; Fahay and Randall 1998; Ringland 1998; van der Heijden et al. 2002). Unfortunately, these writings say little about the potential pitfalls of scenario-based techniques, thus creating the impression that these techniques are a panacea for strategic decision making under uncertainty. In practice, using scenarios to inform organizational decisions is a complex matter and can yield mixed psychological effects, some of which might actually impair judgment and decision making.

Drawing on research in the psychological sciences that has largely been overlooked in the scenario planning literature, this chapter argues that when used unskillfully scenarios can anchor and confine, rather than stretch and expand, strategic thinking and that constructing scenarios can itself be a biased activity, one that can induce new and amplify extant biases rather than remove them. Furthermore, unless skillfully introduced, scenario techniques can reduce or increase disproportionately the confidence and uncertainty of decision makers, leading correspondingly to misplaced optimism and threat rigidity among decision makers. In addition, the chapter highlights how, in some circumstances, the negative emotional impact of scenario analysis can override the potentially positive cognitive effects. Guidelines for using scenarios in organizational decision making are offered throughout.

SCENARIOS AS COGNITIVE DEVICES

In the context of organizational decision making, the term “scenario planning” refers generically to a group of techniques that use multiple scenarios depicting a range of contingencies that the organization might plausibly have to face at future points in time. These scenarios comprise “stories about the future” (Kuhn and Sniezek 1996: 232), portrayed in “script-like narratives that paint in vivid detail how the future might unfold in one direction or another” (Russo and Schoemaker 1992: 13). Typically, scenario analysts construct positive, negative, and status quo futures, depicting strategically important variables (e.g., market demand, product

technology) taking divergent forms (e.g., low vs. high demand; technological obsolescence vs. technological continuation). The aim is to stimulate decision makers to engage in deeper critical reflection on the causal processes underlying external events, developing understanding to inform appropriate strategic responses (Porter 1985; Wack 1985a, b; Schoemaker 1993; van der Heijden 1996).

The roots of scenario usage in organizations lie in forecasting and strategic planning. When used in forecasting applications the ultimate aim is to enable decision makers to assess the viability of strategic alternatives across a range of future scenarios, rather than plan for a single future. In such applications, multiple scenarios replace conventional single point predictions (see, e.g., Schoemaker 1991). Point predictions that take the form of best estimates or single probability distributions assume a solitary basis for action and are notoriously unreliable over the longer term (cf., Hogarth and Makridakis 1981; Pant and Starbuck 1990). Rather than represent uncertainty as deviations from a single best estimate, multiple scenario analysis attempts to place a bound on uncertainty across a range of possible future states (Schoemaker 1991, 1993). When used for strategic planning, the aim is to foster “alertness and responsiveness among decision makers to changing market conditions” (Grant 2003: 506). This entails evaluating how robust current and potential strategies would be under various plausible industry futures depicted in scenarios. Decision makers can evaluate the effectiveness of various strategic alternatives under different scenarios either subjectively or more formally using decision analytic methods (e.g., Goodwin and Wright 2001).

The mainstay of scenario-based techniques is that scenarios act as a “cognitive device” (van der Heijden 1996: 51). Advocates maintain that the process of reflecting on potential events in the operating environment forces decision makers to surface their underlying assumptions and, in so doing, confront future uncertainties and engage in critical debate regarding strategic responses to environmental change (Schwartz 1991; Fahay and Randall 1998; Ringland 1998). Van der Heijden (1996) claims this process improves the fitness of organizations in two ways. In the short-term, more skillful observation of the business environment is purported to increase organizational adaptability. Over the longer term, the robust strategic alternatives generated by this process equip the organization to withstand major shocks or environmental jolts.

BREAKING THE SHACKLES: SCENARIOS AND COGNITIVE INERTIA

A substantial body of theory and research has shown that an overdependence on extant mental representations of the organization and its operating environment is

a major cause of inertia (Porac et al. 1989; Barr et al. 1992; Reger and Palmer 1996; Hodgkinson 1997). The mental models¹ developed by decision makers can fail to change adequately and sufficiently quickly to reflect shifting contingencies in the wider organizational environment. Techniques that purport to help decision makers adjust their mental models in a timely fashion thus have a potentially important role to play in alleviating cognitive inertia. Advocates of scenario planning and related techniques have consistently alleged that scenario-based techniques constitute one such means of evincing adaptive cognitive change (Wack 1985a, b; Schoemaker 1993; van der Heijden 1996; Fahay and Randall 1998; Ringland 1998; van der Heijden et al. 2002). For instance, in his famed account of the success of scenario planning in helping Royal Dutch/Shell anticipate the downturn in world oil prices in the 1970s, Wack (1985a: 84) maintained that the aim was “to design scenarios so that managers would question their own model of reality and change it when necessary.” De Geus (1988: 71) similarly argued that the real purpose of scenario-based techniques in planning is to “change . . . the mental models that decision makers carry in their heads.” Schoemaker (1993: 200–9) expounded the organizational consequences of these effects, suggesting that scenarios “stretch as well as focus people’s thinking . . . challenge people’s mental boundaries” and can be used for “overcoming corporate blind spots and myopic thinking frames.” Unfortunately, however, hard empirical evidence to substantiate these fundamental claims concerning the cognitive benefits of scenario-based techniques is both highly equivocal and limited in scale and scope, comprising in the main descriptive case accounts of apparently successful applications of the techniques in action.

The remaining sections of this chapter provide a more thorough analysis of the psychological issues and associated evidence base supporting the use of scenario-based techniques. Five major challenges confront organizational users: (1) managing the effects of scenarios on uncertainty and (over)confidence; (2) the tendency to anchor on single scenarios; (3) the potential of scenarios to exacerbate biases; (4) the plausibility paradox; and (5) the potentially overpowering affective reactions to the processes and outcomes. The sections that follow consider each of these challenges in turn. Firstly, however, to place these challenges in context it is necessary to consider the rudimentary cognitive effects of scenario thinking.

BASIC EFFECTS OF SCENARIOS ON JUDGMENTS AND DECISIONS

Researchers in the fields of social cognition (e.g., Carroll 1978) and behavioral decision research (e.g., Kahneman and Tversky 1982) construe scenarios as

mental simulations of causally related events with the potential to alter expectations and judgments of their likelihood (for a review, see Gregory and Duran 2001). The most reliable finding to emerge from this body of work is that considering a scenario leads people to believe that the events depicted could occur in reality; that is the perceived likelihood of scenario events increases or is upwardly biased (Carroll 1978; Gregory et al. 1982; Anderson 1983). This effect obtains because considering a scenario makes images of the events depicted come to mind more easily, increasing their availability in memory and hence their influence on judgments (Tversky and Kahneman 1973; Carroll 1978; Kahneman and Tversky 1982). Importantly, however, two factors moderate this effect. Scenarios may not influence judgments when people have strong prior beliefs or preferences about events (Carroll 1978), or when scenarios are difficult to imagine or considered implausible (Anderson 1983; Dougherty et al. 1997). In addition to influencing likelihood judgments, mentally simulating a particular scenario can also incline people to engage in the behaviors simulated (Anderson 1983; Gregory et al. 1982).

Knowledge of the above effects is potentially useful as a basis for persuading key organizational stakeholders to buy into the plausibility of a given scenario unfolding, thereby motivating them to take the necessary action to bring about or avoid certain outcomes (e.g., Hamel and Prahalad 1994; Gregory and Duran 2001). However, heeding scenarios can lead decision makers to overestimate significantly the likelihood of particular events when they focus or anchor on a given scenario. Kahneman and Lovallo (1993) argue that this occurs because considering scenarios leads to the adoption of an "internalized view" when forecasting events relevant to a decision. This occurs when people focus on information that is distinctive to the decision, treat forecasts as independent of prior probabilities for the class of events, and extrapolate current trends in attempting to: "sketch a representative scenario that captures the essential elements of the history of the future" (Kahneman and Lovallo 1993: 25).

Writers and practitioners of organizational scenario planning (e.g., Schoemaker 1993; van der Heijden et al. 2002) frequently warn of the dangers of using single scenarios as a basis for forecasting, which can increase the perceived likelihood or favoring of a focal future state (cf., Gregory and Duran 2001). As noted above, the likelihood of occurrence of any single complex, long-term scenario is too low to provide a reliable basis for planning and decision making, and anticipatory action taken on such a basis may be maladaptive. Since it is undesirable to rely on a single scenario, scenario planners typically advocate considering multiple scenarios to reduce overconfidence in and reliance on favored futures (Porter 1985; Wack 1985b; van der Heijden 1996). However, constructing and analyzing multiple scenarios has mixed effects on uncertainty and confidence that require further illumination.

EFFECTS OF SCENARIOS ON UNCERTAINTY AND CONFIDENCE

Although there is little if any direct evidence that analyzing multiple scenarios can significantly revise mental models, there is some evidence that it can change beliefs about the future. Specifically, researchers have found that considering multiple scenarios can increase uncertainty in predictions. Kuhn and Snizek (1996) and Schoemaker (1993) both found that analyzing multiple scenarios resulted in widened confidence intervals for forecasts. Schoemaker (1993, experiment 1) had students predict the ranges variables such as product sales or the price of a commodity would obtain in the future. Participants made their predictions before and after constructing several scenarios depicting how future events might influence the focal variables. Comparisons of pre- and post-scenario predictions revealed significantly widened ranges following scenario exposure; that is, considering scenarios stretched participants' beliefs about the future. A second experiment showed that these effects are contingent upon the plausibility of scenarios. Considering scenarios depicting extreme (implausible) events resulted in reduced ranges, making decision makers more certain of their predictions, narrowing rather than stretching thinking.

Other evidence suggests that scenario techniques can reinforce rather than challenge predictions of the future. In an apparent paradox, analyzing multiple scenarios can increase subjective confidence in predictions while simultaneously increasing uncertainty over the states predicted. Kuhn and Snizek (1996) demonstrated this in an experiment using scenarios to inform forecasts. Measuring uncertainty and confidence separately, the latter on a direct rating scale, they showed that although considering multiple scenarios widened the credible ranges participants predicted (showing increased uncertainty), it also increased participants' subjective confidence in the accuracy of their predictions. Schnaars and Topol (1987) also found that scenario analysis increases confidence in predictions. They provided forecasters with three narrative scenarios depicting optimistic, pessimistic, or middling sales conditions for a new product, and then asked them to predict product sales using point estimates rather than ranges. After considering the scenarios, forecasters showed greater confidence in their own subsequent sales predictions than their counterparts who did not consider scenarios. Schnaars and Topol (1987: 416) found "no evidence that multiple scenarios caused sales forecasters to hedge their bets in light of an uncertain future," because participants tended to "focus on a single, favored scenario rather than the whole set." The process of considering scenarios makes decision makers more assured of their understanding of the causal forces shaping future events and the uncertainty emphasized by considering multiple scenarios legitimizes subsequent predictions.

In sum, although exposure to multiple scenarios depicting varied states can reinforce perceived uncertainty, it can also make decision makers more confident in the judgments they subsequently make. These mixed effects are potentially problematic for organizational decision makers. Increased uncertainty can be beneficial when it reduces overconfidence in unwarranted prior assumptions (Russo and Schoemaker 1992) and increases information search to benefit judgment accuracy (Lanzetta and Driscoll 1968). In this way, increased uncertainty following multiple scenario analysis might stimulate contingency planning and aid flexibility (cf., Gregory and Duran 2001), when uncertainty is within tolerable limits. Yet, paradoxically, increased confidence in subsequent judgments might constrain actors' thinking about the future. Research has shown that overconfidence biases information search toward sources that confirm favored judgments (Schulz-Hardt et al. 2000) and leads to a neglect of decision aids that improve decision quality (Arkes et al. 1986). Overconfidence in beliefs and prospects after scenario analysis might demotivate and restrict efforts to consider alternative futures and anticipate change, reducing sensitivity and responsiveness to information signaling environmental changes. It is difficult to predict the consequences when scenario analysis increases confidence concomitantly with uncertainty, since research on these joint effects is in short supply. However, three factors are important in addressing the mixed effects of scenario analysis on confidence and uncertainty: (1) differentiating between uncertainty and confidence; (2) generating versus receiving scenarios; and (3) the timing of scenario analysis relative to judgment.

Firstly, some researchers have inferred confidence from predicted ranges (e.g., Russo and Schoemaker 1992; Schoemaker 1993), whereas others have measured subjective confidence directly with self-reported ratings (e.g., Schnaars and Topol 1987; Kuhn and Sniezek 1996), differentiating this from uncertainty as indicated by predictions of ranges. Conceiving uncertainty as a person's beliefs about the variability of possible outcomes and confidence as the belief that a prediction is correct distinguishes the two constructs. Making this distinction, Peterson and Pitz (1988) showed in a series of experiments analyzing sports predictions that confidence and uncertainty have different determinants. They demonstrated that providing decision makers with more information to on which to base predictions increased their confidence in predictions irrespective of the nature of that information. These effects obtained because people believed more information should increase the accuracy of their predictions. In contrast, the effect of increased information availability on uncertainty was contingent upon the nature of the information provided. When the information was equivocal regarding the outcomes of events, decision makers generated more plausible outcomes than when the information suggested a specific outcome; and the greater the number of different plausible event outcomes decision makers generated, the greater their uncertainty. These findings explain why analyzing multiple competing scenarios

can increase uncertainty over predictions but also heighten confidence in the judgments made.

Secondly, there is an important distinction between actively self-constructing and passively considering scenarios. Exemplifying this, whereas studies finding that scenarios increase confidence have presented pre-prepared scenarios to participants (Schnaars and Topol 1987; Kuhn and Sniezek 1996), those finding increased uncertainty and reduced confidence have required participants to generate their own scenarios (Schoemaker 1993; see also Dougherty et al. 1997; Newby-Clark et al. 2000). However, organizational users frequently assume equivalence between uninvolved consideration and active self-construction of scenarios. Internal strategy specialists or external futures experts often build scenarios that, once developed, are subsequently rolled out for decision makers to receive passively (e.g., Klein and Linneman 1981; Schwartz 1991; Ringland 1998), with the result that scenarios can fail to stretch thinking (see, e.g., Wack 1985a, b). This assumption of equivalent effects is problematic, because the act of mentally simulating different scenarios forces decision makers to generate and accept the validity of multiple alternatives and reduces their willingness to rely on a single prediction (Koehler 1991, 1994). Research on counterfactual thinking suggests that self-constructing scenarios is likely to encourage decision makers to adopt a mental simulation mindset that enhances these effects by stimulating the liberal generation of options (Galinsky and Moskowitz 2000; Hirt et al. 2004). Groups that adopt such a mindset also tend to share information more effectively and make better use of evidence that disconfirms assumptions, leading in turn to higher quality decisions (Kray and Galinsky 2003; Galinsky and Kray 2004). The use of others' scenarios, in contrast, requires less cognitive effort and does not encourage adequate mental simulation. Hence, this approach is unlikely to reduce decision makers' perseverance with and overconfidence in their own beliefs, and may actually lead to overconfidence in the events depicted (see Koehler 1994). When, therefore, the goal of scenario planning is to stretch thinking, challenge restrictive assumptions, or reduce overconfidence in favored predictions and beliefs, users should encourage decision makers to generate their own scenarios depicting contrasting but equally plausible events and outcomes, and prioritize scenario techniques that stimulate mental simulation.

Thirdly, the impact of scenario analysis depends on its timing relative to judgment. As noted above, the effect of scenario analysis is somewhat recursive. When decision makers use multiple scenarios to increase uncertainty and reduce overconfidence in prevailing prior beliefs, they may actually become overconfident in their subsequent judgments. Hence, decision makers need to be aware of the potential impact of scenarios not only on their extant mental models and prior assumptions, but also on their subsequent cognitions. Several methods are available for reducing overconfidence in judgments and beliefs formed following scenario analysis (for an overview see Russo and Schoemaker 1992). Encouraging more effortful processing and greater scrutiny of new judgments generally reduces

overconfidence (Arkes 1991). For this reason, holding decision makers accountable for judgments made subsequent to scenario analysis or having them explain and justify their new beliefs might help reduce overconfidence (Tetlock and Kim 1987). Feedback on the accuracy of judgments also reduces overconfidence in beliefs about the future (Lichtenstein et al. 1982; Mahajan 1992), suggesting a role for using structured feedback to question assumptions formed after scenario analysis.

SCENARIOS CAN ANCHOR AND RESTRICT THINKING

As noted earlier, effective scenario planning requires unbiased consideration of multiple futures. In practice, however, there are at least three reasons why biases toward single scenarios are likely to be evident in judgments and decisions made following scenario analysis, even when multiple scenarios are explicitly considered.

Firstly, notwithstanding the dangers highlighted above, decision makers motivated to avoid uncertainty and reduce complexity will often be inclined to anchor on a particular favored scenario even when considering multiple futures, as illustrated by Wack's (1985a) account of the use of scenario planning in Royal Dutch/Shell to confront the uncertainty surrounding the world petroleum market in the 1970s. Despite having gained an incomplete appreciation of the true complexity facing it, fortunately, in this instance the focal scenario turned out to be sufficiently close to the actual events that subsequently prevailed and the organization was in a position to respond effectively. More generally, however, decision makers who gamble on one particular scenario might not be so fortunate.

Secondly, decision makers have a tendency to anchor on self-relevant scenarios, in other words, those futures likely to have a greater impact on the status, goals, resources, and identities of the groups to which they belong. Hence, in general, self-relevant scenarios are likely to attract greater attention, be given greater credence, and weigh heavier on decision makers' judgments and decisions than less self-relevant ones (Gregory et al. 1982; Anderson 1983; Koehler 1991).

Thirdly, recent work on multiple scenario analysis indicates that decision makers tend to anchor their judgments on the first scenario considered. For instance, in a study of new product forecasting Bolton (2003) found that participants who first generated a scenario depicting a successful outcome then generated an opposing failure scenario were significantly more optimistic about the product's future than those who generated scenarios in the opposite order. Moreover, when the researchers attempted to debias participants' judgments by presenting information conflicting the scenarios generated, participants actually shifted their judgments

further in the direction of the first scenario considered; that is, debiasing efforts exacerbated the primacy bias. Bolton theorized that primacy effects occur because the process of generating detailed narrative scenarios entails significant cognitive elaboration, leading in turn to the development of complex causal schemas in memory that act as strong anchors on subsequent judgments. Once developed, these schemas act as conditional frames of reference, leading decision makers to assume the initial scenario is true and thus processing subsequent information in a confirmatory fashion.

In sum, even when analyzing multiple futures decision makers' judgments can be biased toward a single favored scenario as a result of anchoring. Hence, contrary to popular wisdom, scenario analysis can narrow and confine as well as stretch thinking. Removing biases toward particular scenarios is therefore critical to achieving an even-handed consideration of multiple alternatives. There are two main determinants of scenario anchoring effects: motivational and cognitive. Successful debiasing efforts must address both of these factors.

Reducing the pressure to act upon or proactively bring about a particular scenario (rather than anticipate a set of scenarios) is one possible means of reducing the motivation to anchor on a particular scenario. Moreover, encouraging tolerance and acceptance of uncertainty regarding future states and reducing the emphasis on achieving closure by settling on a specific future both have roles to play in alleviating scenario anchoring effects. Reducing the pressure to justify scenarios to others might represent a further means of counteracting the tendency to focus prematurely on a single scenario in an attempt to reduce ambiguity (see Curley et al. 1986). However, since such justification may be required for evaluating the internal consistency of scenarios, or to heighten group dialectical inquiry using scenarios, the latter approach requires users to strike a fine balance between reinforcing anchoring and evaluating scenario consistency.

Although it is tempting to instruct decision makers to consider competing scenarios as a means of removing anchoring effects, this strategy can exacerbate the problem, as highlighted by Bolton's (2003) studies, discussed above. Hence, scenario planners need to adopt alternative strategies to address this problem. As argued above, constructing each scenario with equal cognitive elaboration in the first instance might attenuate the tendency to anchor on initial scenarios. Involving all decision makers in the construction of all scenarios under consideration should hopefully yield similar effects, whereas allotting different groups of decision makers to focus on constructing different (single) scenarios, as is often the case in practice (e.g., Schwarz 1991), encourages each group to anchor on their own focal scenario. Using decision analytic methods to stimulate equal consideration of multiple scenarios appears particularly amenable to reducing scenario-anchoring effects. Evaluating scenarios systematically using formal evaluation procedures will help structure the attention afforded to multiple scenarios and should mitigate against imbalanced consideration (for a similar approach see Goodwin and Wright 2001).

Given the evident links between cognitive elaboration and anchoring effects, it might be desirable to conduct multiple scenario analysis regularly in short bursts rather than to doing so episodically in an elaborate manner. The former approach should prevent decision makers from developing and reinforcing detailed scenarios of the sort that encourage the formation of elaborate schemas and thus fuel anchoring bias. Brown and Eisenhardt's (1997) study of strategic decision making in high velocity environments supports this idea. They found that firms making successful decisions used scenarios as fast, undemanding probes into the future. Such "quick and dirty" usage of scenarios contrasts markedly with the lengthy and involved corporate scenario planning exercises typical of those reported in the popular management literature.

THE ROLE OF SCENARIOS IN ATTENUATING AND EXACERBATING BIASES

As noted above, writers often posit scenario techniques as a means of debiasing judgments and overcoming reliance on potentially suboptimal cognitive heuristics. However, the situation is more complex than is sometimes presented. As noted in the previous section, scenarios can act as anchors and thus create new biases within the wider organizational decision-making process. Moreover, scenarios can both attenuate and exacerbate extant biases. The act of generating scenarios is also prone to bias, undermining their effectiveness as decision aids.

Schoemaker (1993) argues that scenarios overcome certain biases by exploiting others. Reducing overconfidence with the help of the conjunction fallacy (Tversky and Kahneman 1983) provides a convenient example. Although the greater the causal complexity of a given scenario, the greater its perceived plausibility, the actual likelihood of occurrence of a scenario actually decreases as progressively greater numbers of causally related events are woven into the accompanying narrative. As scenarios become more causally complex they become credible alternatives to currently held views of the future, reducing overconfidence (Russo and Schoemaker 1992; Schoemaker 1993).

A further claim made by advocates is that scenario analysis can attenuate the availability bias (e.g., Schoemaker 1993). This is the tendency for people to base judgments on information that comes easily to mind and undervalue information that is difficult to imagine or recall (Tversky and Kahneman 1973). Scenario thinking attenuates availability effects through two mechanisms: by increasing the availability of less familiar information and by encouraging the simulation heuristic. In the first instance, constructing scenarios with less familiar content can

increase the availability of information that decision makers might otherwise neglect. For example, constructing unfavorable and counterintuitive scenarios may increase the availability of negative and disconfirmatory information respectively, both of which are generally less available in memory than their opposites (Newby-Clark et al. 2000; Jonas et al. 2001). The simulation heuristic overcomes availability effects through a different means. In this case, judgments of the likelihood of an event are based on the ease with which scenarios leading to the event can be mentally constructed or simulated, rather than on the availability of prior beliefs or similar past events (Kahneman and Tversky 1982). Simulating several plausible scenarios makes it apparent that credible alternative futures exist, thus challenging prior beliefs in a single future.

When decision makers consider a plausible scenario for the outcome of an event, the scenario acts as an explanation of the event that they can rely on when predicting how the event will unfold (Hirt and Sherman 1985; Hirt and Markman 1995). However, mentally simulating alternative plausible explanations reduces bias towards an initial explanation (Hirt and Markman 1995). Consider the following. When financial analysts view managers' self-servingly positive plans in the form of narrative scenarios, they are often seduced into making over-optimistic forecasts (e.g., Kadous et al. 2006). However, providing analysts with counter-explanations, outlining why managers' plans might fail, for example, reduces the optimism induced by scenarios and makes forecasts more realistic (Kadous et al. 2006; see also Dougherty et al. 1997). Nevertheless, considering counter-explanations that are implausible or difficult to generate strengthens the bias towards prior beliefs (Hirt and Markman 1995; Dougherty et al. 1997; Kadous et al. 2006). Scenario anchoring effects appear to be less prominent in multiple explanation research than in the forecasting studies reviewed above (Schnaars and Topol 1987; Kuhn and Sniezek 1996; Bolton 2003). This is perhaps because in multiple explanation studies participants do not themselves explicitly generate the kind of detailed narrative scenarios that require significant cognitive effort and encourage the development of elaborate schemas that act as anchors on judgments, which are evidently not so easy to shift.

One factor that can militate against the ability of scenarios to reduce biases is that the very process of constructing scenarios is also susceptible to bias. For example, when making predictions people often construct overly optimistic scenarios that do not adequately account for negative events, falling foul of the so-called positivity bias. This bias can yield inaccurate forecasts that envisage largely positive events and minimize potential problems with a particular course of action (Buehler et al. 1994; Schoemaker 1995). Even when people consider both pessimistic and optimistic futures, negative scenarios are not only considered less plausible, they are given less credence and have less impact on judgments than positive ones (Newby-Clark et al. 2000). Moreover, generating scenarios collectively in groups rather than individually may worsen the bias towards positive or optimistic

information. In a series of laboratory and field studies Buehler et al. (2005) showed that because groups typically focus on “planning for success” when making predictions, group discussion makes positive information more available, thus accentuating the optimism bias.

The above effects suggest a role for purposively giving greater emphasis to negative events when constructing scenarios. Developing “worst case” scenarios is an obvious remedy that can reduce bias toward positive information (Buehler et al. 1994). Since the ambiguity of future events facilitates positivity bias, when decomposing future events into their constituent components and consequences scenario planners should systematically simulate the potential negative consequences of these events rather than accept positive construals.

THE PROBLEM WITH INCREDIBLE FUTURES: THE PLAUSIBILITY PARADOX

To be effective, on the one hand scenarios must challenge and, where necessary transform, actors’ mental models and beliefs to inform and stretch strategic thinking. On the other hand, scenarios must be plausible so that decision makers meaningfully accept them. Only then, will scenarios foster involvement in explorative analyses, convince of the need for change and motivate action to anticipate change. However, achieving these twin imperatives can be problematic because they do not sit together comfortably. Specifically, the nature of plausibility creates difficulties, because “a highly plausible scenario is one that fits prior knowledge well” (Connell and Keane 2006: 95). The problem here is that highly plausible scenarios are likely to reaffirm what decision makers already know; hence, they are unlikely to challenge their core assumptions or change their mental models. Yet, when scenarios do not fit with current ways of thinking borne of prior knowledge, decision makers may reject them out of hand.

A further problem with attempting to generate requisitely challenging scenarios is that decision makers may be predisposed to generating undemanding scenarios. Concepts that are central to the way decision makers’ mentally represent and comprehend objects and events are cognitively immutable, in other words, they are resistant to change in mental simulation (see Sloman et al. 1998). For this reason, decision makers may be prone to constructing scenarios that are constrained by their extant mental models, tending to construct scenarios consonant with their pre-existing worldviews. Consequently, there is a danger that that self-constructed scenarios constrained by extant mental models may fail to break the beliefs embedded in those models and challenge sufficiently status quo thinking.

One way of helping decision makers avoid the tendency to construct unchallenging scenarios based on extrapolations from extant mental models is to introduce novel outsider perspectives and diverse information sources at the early stages of scenario generation, without losing the benefits of mental simulation that accrue from self-constructing scenarios. This reasoning supports the use of industry experts to inform the scenario construction process, as, for example, by incorporating the counter-intuitive ideas of so-called “remarkable people” (Schwartz 1991; van der Heijden 1996) to first stretch thinking then increase the plausibility of future events that might otherwise be dismissed as outlandish.

BLOWING HOT AND COLD: AFFECTIVE DIMENSIONS OF SCENARIO PLANNING

Practitioners typically design the scenario planning process to emphasize uncertainty, instability and precariousness rather than to underline surety or make accurate predictions (e.g., Porter 1985; Wack 1985a; Schoemaker 1993; van der Heijden 1996; van der Heijden et al. 2002). Although the cognitive consequences of this approach may be beneficial, when decision makers employ scenarios appropriately, the emotional or affective effects of uncertainty can present decision makers with considerable difficulties. Specifically, perceived uncertainty over anticipated events, decisions, and their outcomes has been linked with rigidity and slower decision making (Staw et al. 1981; Wally and Baum 1994), escalation of commitment to a failing course of action (Bragger et al. 1998), and increased interpersonal conflict and reduced performance among decision making groups (Argote et al. 1989). Affective mechanisms are largely responsible for these effects. Uncertainty and risk generally increase negative affectivity among decision makers; for example, risky decisions stimulate worry, fear, dread, and anxiety (Loewenstein et al. 2001). When facing decisions where significant negative consequences are possible but the best strategy is uncertain, people become anxious and process information in a narrow and labored manner (Luce et al. 1997). Such findings are highly relevant since these are the circumstances often occupied by organizational decision makers using scenarios to inform their choices.

Scenario planning processes are likely to heighten negative affectivity among decision makers for at least two reasons. Firstly, achieving emotional impact is a stated aim for scenario practitioners. According to van der Heijden and colleagues (2002: 263), the scenarios that have the strongest influence are those that “elicit feelings of fear, hope, security, and threat” since these “create the jolt needed for action.” Secondly, even without the explicit aim of provoking emotional reactions,

evoking strong feelings is an inherent consequence of articulating and simulating future events through scenarios rich in imagery. As Loewenstein and colleagues (2001: 275) asserted, "one of the most important determinants of emotional reactions to future outcomes is the vividness with which those outcomes are described or mentally represented." In extensive scenario planning exercises decision makers are compelled to heed elaborate scenarios in which futures are articulated through multimedia sources rich in imagery (see example cases from British Telecom: Moyer 1996; and from Royal Dutch/Shell: Kassler 1995). Merely simulating potentially threatening events is enough to create anxiety, for "emotions arise in large part as a reaction to mental images of a decision's outcomes," decision makers being "sensitive to the possibility rather than the probability of negative consequences" (Loewenstein et al. 2001: 276). It is the possibility of a negative event highlighted by a scenario with affective prospects, such as the failure of the current business model in a hostile future, that can "lead to an affective reaction to a salient image, and this feeling (not explicit consideration of the scenario's probability) may guide behavior" (Hsee and Rottenstreich 2004: 28).

The above body of work suggests that the "hot" emotive effects of scenario induced uncertainty (e.g., heightened anxiety and threat rigidity) may overpower its "cold" cognitive effects (e.g., stretched thinking, open-mindedness, desire for more information, decisional flexibility). When rational cognitive reactions conflict with more visceral affective reactions, and when the latter are of sufficient intensity, visceral responses often dominate decision-making behavior, including the assessment of prospects and choice of alternatives (for reviews, see Loewenstein 1996; Loewenstein et al. 2001).

Hodgkinson and Wright (2002) graphically illustrated how emotional reactions to scenario planning processes can overpower their putative cognitive effects. These researchers attempted to use scenario techniques to help a publishing firm confront the implications of market changes so that it might put itself in a position to adapt. The organization faced a highly uncertain future. Industry advances looked set to displace the company's main offering, but it was unclear which business model and technologies would provide the best route(s) to survival. In constructing the scenarios, the management team focused on envisaging quite vividly a threatening future in which technological changes would replace their main offering, to the extent that this triggered defensive avoidance (Janis and Mann 1977) and threat rigidity effects (Staw et al. 1981). Consequently, they were unable to reach a consensus on an alternative to the current failing strategy. This proved to be anything but an anhedonic process. The scenario intervention "raised the levels of decisional stress and conflict within the organization to unacceptably high levels" (Hodgkinson and Wright 2002: 964). The stress created by attempting to face an uncertain future with a disparate team led the decision makers to adopt a variety of dysfunctional coping strategies, including bolstering commitment to the current failing strategy, procrastinating, and

shifting responsibility for maintaining the inert status quo to other stakeholders within the firm.

The implication here, then, is that effective scenario planning requires understanding of the mechanisms and consequence of the emotional processes at work, the ability to identify signs of the impact of negative affect, and techniques for dealing with the potentially overpowering affective consequences of scenario activities. Scenario planners can attempt to reduce anxiety borne of perceived lack of control by systematically incorporating activities to develop plausible contingencies for dealing with specific threatening events highlighted by scenario analysis. Similar strategies have proved effective for dealing with the mental simulation of important personal events (e.g., Pham and Taylor 1999). Emphasizing collective responsibility for responding to difficult situations might also reduce felt isolationism for key decision makers, creating reassurance and mitigating avoidance behavior. Furthermore, the emotional effects scenarios have on decision processes highlight the importance of developing a supportive psychological climate to lessen the impact of future focused anxiety on learning. The role of the facilitator in identifying the signs of the dysfunctional coping strategies highlighted above and taking actions to re-engage participants displaying defensive avoidant behavior in connection with the scenario planning process is crucial.

SUMMARY AND CONCLUSIONS: DESIGNING EFFECTIVE SCENARIO INTERVENTIONS

Applying scenario techniques to inform organizational decisions requires confronting several important but underappreciated difficulties highlighted in this chapter. Understanding and surmounting these problems is critical, if users of these techniques are to produce the decisional benefits sought through the putative cognitive mechanisms.

As we have seen, scenarios exert mixed effects on uncertainty and confidence. They can heighten or reduce overconfidence, contingent upon the nature and timing of scenario analysis relative to judgment, and reinforce as well as stretch staid thinking about the future. There are several ways of maximizing the ability of scenario techniques to evince cognitive change. The decision makers expected to benefit from broadened thinking should themselves generate and analyze scenarios, and planners should strive to make scenarios plausible but challenging. Decision makers should be aware of the effects of scenarios on overconfidence in subsequent judgments. Scenario planners can mitigate these effects by providing

decision makers with continuous feedback on predictions and encouraging effortful processing of new judgments formed after multiple scenario analysis.

Unfortunately, unless deployed skillfully, scenario-based techniques can replace old biases with new ones. The use of decision analytic techniques to systematize scenario analysis and structuring the scenario construction process to equalize the elaboration of competing scenarios should help overcome biases toward particular scenarios. Regularly analyzing multiple scenarios in a fast and simple manner, rather than elaborately but infrequently, is another potentially useful means of reducing scenario anchoring effects. As discussed earlier, decision makers' extant mental models can potentially restrict the scenarios produced. To overcome such biases, facilitators of the process should systematically introduce types of information that decision makers may otherwise overlook in scenario generation, particularly negative and disconfirmatory/counterintuitive information regarding future events, with a view to aiding the development of challenging and unbiased scenarios that are more likely to stimulate meaningful cognitive change. The plausibility paradox dictates that such scenarios must be challenging enough to stretch thinking but plausible enough to foster engagement in analyzing, and acting to anticipate, the future.

Arguably, the most significant problem facing would-be users is how best to manage the emotional outcomes that scenario-based techniques can yield, specifically rigidity and avoidance. This requires careful handling of the anxiety and decisional stress that can arise when users imagine and simulate future threats with scenarios. Increasing perceived control by focusing attention on the plausibility and attainability of strategies for dealing with specific threats highlighted by scenario analysis can help achieve alleviate such effects, as can the fostering of collective responsibility for dealing with impending problems. Developing a supportive psychological climate is paramount for reducing anxiety, maintaining a future-focus, and alleviating avoidant and dysfunctional behavior.

Scenario-based techniques promise much, but are fraught with many potential difficulties. Although the skillful deployment of these methods cannot guarantee that organizational decision makers will always anticipate the shifting contingencies confronting them in what is an increasingly uncertain world, ignoring the insights of the work reviewed in this chapter is a sure fire way of making the future more troublesome.

ENDNOTE

- ¹ A mental model is an internal representation of entities and the relations between them that "mirrors the relevant aspects of the corresponding state of affairs in the world" (Johnson-Laird 1980: 98).

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