Evidence-Based Strategies to Improve Workplace Decisions: Small Steps, Big Effects

Reeshad S. Dalal
Balca Bolunmez
George Mason University

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Reeshad S. Dalal (Ph.D., 2003, University of Illinois at Urbana-Champaign) is the Chair of the psychology department at George Mason University in Fairfax, Virginia (U.S.A.). His research interests in judgment and decision-making are primarily in the areas of advice giving and taking, policy capturing, decision-making skill (competence) and style, and debiasing. His other research interests include employee performance, personality, work situations, job attitudes, within-person variability across situations, and organizational psychology approaches to the study of cybersecurity. He currently serves on the editorial board of the *Academy of Management Journal* and he previously served on the editorial board of the *Journal of Applied Psychology*. He has co-edited two books (one on judgment and decision-making). In addition to his academic work, he has been involved in applied projects related to job attitudes, work experiences, cybersecurity teams, job analysis, standard-setting, program evaluation, content validity, and forecasting.

Balca Bolunmez is a doctoral student in the Industrial and Organizational Psychology Program at George Mason University in Fairfax, Virginia (U.S.A). Bolunmez received her M.S. in textile engineering from Dokuz Eylul University in Turkey, where she conducted research on performance improvement in apparel production. She received her MBA from New Jersey Institute of Technology, where she conducted research on decision support systems. Prior to attending George Mason University, Bolunmez taught in academia and worked in apparel sourcing business. Her current research interests in judgment and decision-making include individual and team decision-making processes, decision quality, advice taking and advice networks. Her other research interests include invisible stigmas, job performance and research methods.

ABSTRACT

Although the need for effective decision-making is ubiquitous in the workplace, in practice the failure rate of important workplace decisions is surprisingly high. This white paper discusses evidence-based strategies that can be used to improve the quality of workplace decisions in today's data-rich but time-poor environment. We emphasize strategies that are applicable across a wide variety of workplace decisions and that are relatively simple to execute (in some cases, requiring just a few minutes). We also respond to potential objections to the use of structured decision strategies. We end with a pre-decision checklist for important decisions.

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It has been estimated that major decisions in firms have a failure rate higher than 50% (Nutt, 2002). Analysis of failed decisions such as ill-fated acquisitions, shortsighted investments in new products and disastrous C-suite hires suggests that the culprit was often a poor decision-making strategy (Lovallo & Sibony, 2010; Nutt, 2002). Moreover, decision-making is important in a variety of occupations and at a variety of levels in a firm's hierarchy. For instance, according to the Occupational Information Network (O*NET; http://www.onetonline.org), the skill of "judgment and decision-making" is important for 742 occupations—including not just occupations that require extensive knowledge, skill and experience (e.g., chief executives, investment fund managers and industrial-organizational psychologists) but also occupations that require little previous knowledge, skill and experience (e.g., nonfarm animal caretakers, septic tank servicers and sewer pipe cleaners, and parking lot

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attendants).[1] In some senses, this should not be surprising because virtually all behavior at work is the result of decisions (Dalal et al., 2010).

At the same time, in the current era of "data smog" or "infoglut" (Edmunds & Morris, 2000, p. 18), many employees feel as though they must engage in "constant, constant, multi-tasking craziness" (Gonzalez & Mark, 2004, p. 113). For instance, Gonzalez and Mark (2004)—who studied analysts, developers and managers—concluded that, even under conservative assumptions, the amount of time spent in continuous work on one project before switching to another project was on average less than 13 minutes. There is, therefore, a pressing need in the workplace for decisions that are both effective (i.e., that increase the performance of the individual employee or the organization) and efficient (i.e., that require little time, effort and money).

This white paper discusses evidence-based strategies aimed at efficiently improving the quality of workplace decisions. We first explain why it is insufficient to rely solely on intelligence and experience as predictors of effective decision-making. We then turn to decision-making strategies—and we propose strategies that are applicable across a wide variety of workplace decisions, that are relatively simple to execute and that can be executed quickly (in some cases, in just 5-10 minutes; Lovallo & Sibony, 2013). We also discuss objections to the use of structured decision strategies, including the very legitimate concern that, given the endless stream of workplace

[1] This O*NET skill search was conducted on August 10, 2016. The number of relevant occupations will change as O*NET continues to evolve.

decisions that need to be made, the consistent use of any structured decision strategy is impractical. We end with a pre-decision checklist for important decisions.

An Emphasis on Intelligence and Experience Is Insufficient

Many organizational psychologists and HR professionals may believe that, rather than trying to "build" effective decision-making (by routinizing the use of effective decision-making strategies), a firm ought simply to "buy" (i.e., hire) effective decision-makers. Specifically, they may believe that factors commonly considered during the employee selection process are sufficient to ensure that new hires will be effective decision-makers.

For instance, some organizational psychologists and HR professionals may wonder whether effective decision-making is synonymous with intelligence. After all, intelligence has, time and again, been shown to be among the best predictors of job performance (Schmidt & Hunter, 1998). Decision-making research, however, suggests that although intelligence is indeed necessary for effective decision-making, it is not sufficient (Stanovich, 2009). To take just one example: over a 15-year period, the portfolio of the investment club at Mensa (a society for high IQ individuals) returned a mere 2.5% annually compared to the S&P 500's 15.3% annual return over that same period (Laise, 2001). Indeed, research suggests that intelligence exhibits weak-to-moderate relationships with effective decision-making on

Dysrationalia: The inability to think and behave rationally despite having adequate intelligence.

an array of decision problems (Stanovich, 2009).[2] This is probably due to a variety of reasons (see Stanovich, West & Toplak, 2011), one of which is that intelligence does not appear to help people gauge when they need to engage in an analytical decision process rather than relying on cognitive shortcuts. In fact, Stanovich (2009) has gone so far as to coin the term "dysrationalia" to indicate "the inability to think and behave rationally despite having adequate intelligence" (p. 35).

If effective decision-making is not reducible solely to intelligence, is effective decision-making within a particular domain (e.g., in a particular occupation) reducible to experience in that domain? After all, the organizational psychology literature shows that experience—at least up to a point—is related positively to job performance (Schmidt & Hunter, 1998). Decision-making research suggests that experienced professionals certainly *think* they make effective decisions in their domain of competence. However, in reality they are often quite overconfident about the quality of their decisions (Russo & Schoemaker, 1992). Stated differently: although experienced professionals typically make better decisions than their novice counterparts, they also think they make better decisions than they actually do. Moreover, on occasion, experienced professionals may even make worse decisions than their newly trained counterparts (Camerer & Johnson, 1991). This is in part due to

Experienced professionals *think* they make effective decisions, but they are often quite overconfident.

[2] The relationship between intelligence and effective decision-making may be somewhat higher when optimal research methods are used (e.g., more reliable measures, less range restriction in scores). Nonetheless, we believe that Stanovich's (2009) general contention—namely, that effective decision-making cannot be reduced solely to intelligence—continues to hold (see also Bruine de Bruin, Parker, & Fischhoff, 2007; Toplak, Sorge, Benoit, West & Stanovich, 2010).

the fact that, whereas formal (structured) training involves the use of consistent—and consistently effective—decision strategies, subsequent experience (which tends to be informal/unstructured) does not (Camerer & Johnson, 1991).

Intelligence and experience, then, may be necessary but do not appear to be sufficient for effective decision-making. Firms should therefore emphasize—and attempt to routinize—effective decision-making strategies.

Routinizing Effective Decision-Making Strategies

Not every structured decision-making strategy works well (see Fischhoff, 1982; Milkman, Chugh & Bazerman, 2009). Complicated decision aids (such as multistage decision-making trees) and overly narrow and prescriptive standard operating procedures are frequently ignored because of their complexity and inflexibility. Telling people that they are biased in a particular direction (e.g., that they are overconfident) does not work either. Even a sustained program of feedback about bias is at best mildly effective—and probably not worth the effort.

Recognizing the need for effective decision-making strategies, some professions and firms have developed their own "folk" approaches. Heath, Larrick and Klayman (1998) provide several examples. The expression "Don't confuse brains with a bull market," for example, is intended to prevent Wall Street traders from generating self-serving explanations for their success (Heath et al., 1998, p. 6). As another example, the Federal Reserve Bank of New York evaluates the financial soundness of banks using a rating

Traders on Wall Street are warned not to confuse brains with a bull market.

system known as CAMELS: Capital adequacy ratio, Asset quality ratio, Management quality ratio, Earnings ratios, Liquidity ratios and Sensitivity to market ratio (Christopoulos, Mylonakis & Diktapanidis, 2011; Heath et al., 1998).

Although these "folk" decision-making strategies are appealing, they are typically applicable only to specific decision problems faced by specific professions or firms. Instead, the decision-making strategies we describe are applicable to a wide variety of decision problems—and therefore can be used across professions and firms. Moreover, unlike the aforementioned ineffective decision strategies, the strategies we describe are evidence-based: each of them has repeatedly been shown to improve decision accuracy. Finally, the strategies we describe are relatively simple to follow and relatively quick to execute (Lovallo & Sibony, 2013).

Before discussing our recommendations, however, we note that decision-making strategies are most useful when multiple options (alternatives) are being considered. Yet, an analysis of strategic decisions made by business, nonprofit and government entities suggested that for 70% of these decisions only one alternative to the status quo was considered (Lovallo & Sibony, 2013). This is despite the fact that considering even one additional option (i.e., alternative) leads to appreciable improvements in decision quality (Lovallo & Sibony, 2013). Therefore, prior to making the decision using a particular decision strategy, decision-makers should ask themselves whether they are

Unfortunately, in 70% of strategic workplace decisions studied, only one alternative to the status quo was considered.

neglecting any reasonable options. If they still find themselves with only one option, decision-makers should force themselves to generate a second option, no matter how outlandish it may seem.

We now discuss three strategies that decision-makers can fruitfully use to evaluate options that have already been generated. All three strategies facilitate the use of an analytical approach to the decision rather than the use of often-suboptimal cognitive shortcuts.

Consider the Opposite

The first strategy is called "consider the opposite" (Lord, Lepper & Preston, 1984). The strategy is very simple: decision-makers merely attempt to generate a handful of reasons why their initial decision may be wrong (Larrick, 2004).[3] The strategy prompts decision-makers to consider information that they would not normally have considered and requires them to plan for a wider range of scenarios than they would normally have done.

> Generate a few reasons why your initial decision may be wrong.

Several variants on the "consider the opposite" strategy exist. In a "premortem" (Klein, 2007), the decision-maker imagines that the decision in question has already been made—and has failed spectacularly. The decision-maker then generates reasons as to why the decision might have failed. Another variant involves

[3] The emphasis on generating a mere handful of reasons is deliberate. First, it ensures that the strategy can be executed efficiently—within a few minutes. Second, attempting to make the strategy more "rigorous" may backfire: the decision-maker may be unable to generate a large number of reasons why he or she was wrong and, in the process, may perversely come to the conclusion that he or she must originally have been correct after all (Larrick, 2004).

asking an advisor to serve in the role of "Devil's Advocate" by deliberately critiquing the preferred option (Schwenk, 1990).

Despite (or perhaps because of) the simplicity of "Consider the Opposite" and its variants, the strategy has been shown to be very successful in improving decision-making (Arkes, 1991; Larrick, 2004). Lord et al. (1984, Study 1), for example, found that the "consider the opposite" strategy decreased decision-making bias by 12.8% on average (whereas simply warning participants not to be biased actually increased bias). Hoch (1985) similarly found that generating a single reason for why a target event might not occur improved the accuracy of estimates of the probability of occurrence of that event by 6% (whereas generating a reason for why the target event might, in fact, occur did not improve accuracy). Soll and Klayman (2004) found that although participants who were 80% confident were normally correct only 30-40% of the time (indicating severe overconfidence), using a decision strategy that indirectly required them to consider the opposite led to them being correct almost 60% of the time (indicating milder overconfidence). Finally, Schwenk's (1990) quantitative review (meta-analysis) of the Devil's Advocacy literature revealed a 58% likelihood (as opposed to the 50% expected by chance) that a decision will be superior if it is made using this technique than if it is made after obtaining a recommendation from an advisor.[4]

[4] We generated this "common language effect size" by converting the meta-analytic Cohen's *d* of 0.28 obtained by Schwenk (1990) into the "probability of superiority" (see Ruscio, 2008).

Take an Outside View

Although imagining what could go wrong is very helpful, it may not be sufficient. Managers who are asked to come up with "worst case" scenarios actually end up describing only mildly negative scenarios; that is to say, their worst-case scenarios are frequently well short of the actual worst case (Kahneman & Lovallo, 1993). This is probably attributable to the fact that managers tend to take an "inside view" that focuses solely on the current decision problem, considering it in splendid isolation (Kahneman & Lovallo, 1993).

Construct a set of at least 6 existing decisions that are similar to the current one—and then use those decisions to inform the current one.

The second strategy we recommend, therefore, is to "take an outside view." This strategy recognizes that the decision-maker is almost certainly not the first person who has ever made this type of decision. Consequently, a decision-maker using the "outside view" strategy attempts to locate a "reference class" of several existing decisions that are similar in important respects to the current decision. Lovallo and Sibony (2010) suggest trying to locate at least 6 decisions similar to the current one. However, it is possible that the reference class constructed by the decision-maker will itself be biased in an optimistic direction (Lovallo, Clarke & Camerer, 2012). Therefore, the decision-maker should explicitly attempt to locate some similar decisions that could be viewed as failures.

The reference class can then be used to inform the current decision in several ways: for instance, the amount of time needed to implement the current decision, the likelihood that the current decision will be successful if a certain option is chosen, and so forth. Importantly, these judgments are made on the basis of the reference class, not the properties of the current decision. The properties of the current decision are used only to select the reference class in the first place.

Consider, for instance, a firm that is deciding whether to acquire another firm. The "outside view," drawn from the research literature, is that 70-90% of mergers and acquisitions fail (Christensen, Alton, Rising & Waldeck, 2011; Lovallo & Kahneman, 2003). In light of this, the rational decision would be to avoid moving forward with the acquisition. At the very least, a cheerleader for the acquisition should be required to somehow make a very strong case as to why "this time is different."

Existing research demonstrates the effectiveness of taking an outside view in reducing delusions of success. Lovallo et al. (2012), for example, found that when respondents became aware that their estimated rate of return for a focal project exceeded that of the reference class (indicating unrealistic optimism), 82% did revise their estimate downward—and on average did so by more than 50% of the difference between the focal project estimate and the reference class. Lovallo and Kahneman (2003) similarly reported results showing that although the average student expected to outperform 84% of his or her peers (a logical impossibility), a simple exercise in taking the outside view—that is, comparing his or her own entrance scores to those of peers—reduced the unrealistically optimistic performance expectations by 20%.

Construct a Linear Decision Model

The third individual strategy we discuss involves the use of what is variously referred to as a "linear"[5] model, a "weighted additive" model or an "actuarial" model (e.g., Chu & Spires, 2003; Dawes, 1979; Meehl, 1954; see also Saaty's, 1990, "analytic hierarchy process"). In brief, such a model requires the decision-maker to first determine the available options for a particular decision and to then: (1) determine the factors that should influence the decision, (2) judge the importance of each of these factors, (3) rate each option on each factor, (4) for each option, calculate the overall score as the sum of the scores on each factor weighted by the importance of that factor, and (5) choose the option with the highest overall score. For instance, a committee deciding which applicants to admit to graduate school may consider several factors (standardized test scores, undergraduate grade point average, number of research products, etc.) and may weight an applicant's scores on these factors by the importance of the factors while calculating an overall "graduate school success potential" score for each applicant.

Determine the factors that influence the decision, determine the importance of each factor, and then rate each option on each factor.

We would be remiss not to acknowledge that using a linear decision model has historically required some effort (Chu & Spires, 2003). Until recently, for example, this strategy would probably have required the use

[5] Typically, a linear model is used. Such a model excludes polynomial and interaction terms that add complexity but typically provide little additional predictive power.

of a spreadsheet such as Microsoft Excel. Why, then, do we—despite our stated emphasis on simple, usable strategies—advocate the use of this strategy?

Our answer is threefold. First, this strategy has often been considered among the most beneficial from a decision accuracy perspective (Chu & Spires, 2003). Therefore, although the costs in terms of time and effort are a bit higher for this strategy than for the previously discussed strategies, even expert decision-makers should benefit from this strategy. In this regard, a quantitative review (meta-analysis) of the literature found that, across several fields (e.g., educational, financial, forensic, medical and clinical-personality), "mechanical" or "actuarial" methods such as linear models outperformed expert judgments by about 10% on average (Grove, Zald, Lebow, Snitz & Nelson, 2000). Second, new technologies have lowered the effort required to execute this strategy. For example, smartphone applications[6] can decrease decision-maker effort by providing an attractive user interface, by doing the math so that the decision-maker does not have to, and by providing pre-existing lists of common decisions (e.g., choosing between various job offers) accompanied by pre-existing lists of factors that should be considered for those decisions (e.g., location, salary, prospects for advancement). In other words, although technology has resulted in information overload in modern professional jobs, technology can also be harnessed to reduce the cognitive load associated with using effective decision-making strategies. Third, the effort level associated with this strategy can be decreased still further, often with little

[6] Current examples include *FYI Decision* and *ChoiceMap*.

to no decrement in accuracy, by simply treating each factor as equal in importance for the decision (Dawes, 1979; see also Chu & Spires, 2003).

Of course, linear decision models can be used in conjunction with the previously described strategies. For instance, taking an "outside view" can help decision-makers determine how important each factor should be considered in a linear model.

Objections and Potential Solutions

Socrates famously proclaimed that the unexamined life is not worth living (Brickhouse & Smith, 1984). After perusing our white paper, however, readers may object that the overly examined life is not worth living either. Although we have avoided recommending complex decision strategies (e.g., the use of multistage decision-making trees) in favor of much simpler strategies, we acknowledge that not every strategy we endorse is simple in an absolute sense. Moreover, even the simplest strategy could quickly become burdensome because almost everything an employee does at work is the product of decisions he or she has made (Dalal et al., 2010).

> Just as important as using an effective decision strategy is knowing *when* to use it. Use it *consistently* for high-stakes decisions as well as for unfamiliar decisions. Use it *periodically* for familiar and low-stakes but very frequent decisions.

Using a structured decision strategy for every single workplace decision is a recipe for "analysis paralysis"—and for rapid burnout. Moreover, some workplace decisions are highly time-sensitive and are consequently not amenable to an elaborate decision

strategy (Vroom, 2000). Therefore, just as important as using an effective decision strategy is knowing when to use it.

We therefore discuss three types of decisions that, in our view, warrant the use of a structured decision strategy (see also Lovallo & Sibony, 2010). High-stakes decisions definitely warrant a structured decision strategy. Unfamiliar decisions also warrant a structured decision strategy so as to help decision-makers uncover their options and learn their preferences. Both these types of decisions may occasionally be time-sensitive, but they nonetheless deserve as effective a strategy as possible under the circumstances.

However, what of familiar and low-stakes but very frequent decisions? The high frequency of such decisions makes them important. However, the high frequency also means that using a structured decision strategy on every occasion is simply not feasible. We therefore suggest that, over time, employees create a list of the decisions they would like to reexamine, and that they subsequently use structured decision-making strategies to reexamine these decisions one by one, as time and workload permit. After each such decision is reexamined, the optimal response should—at least for a while—become the default response, as codified in the firm's policies and procedures.

Decision-makers retain considerable autonomy when using structured decision-making strategies.

A second potential objection is that autonomy is important for motivation (Spector, 1986), and that these strategies, by reducing decision-makers' autonomy,

reduce their motivation. However, decision-makers using the structured strategies we have described do retain considerable autonomy. For example, when using a linear model, decision-makers retain the autonomy to determine the available options for the decision at hand, the factors that should influence the decision, the importance of each factor to the decision and how each option fares on each factor.

A third potential objection is that people rarely make important decisions without soliciting the advice of others—and existing research demonstrates conclusively that taking advice, especially from experts, improves decision quality (Bonaccio & Dalal, 2006; Vroom, 2000). However, the aforementioned decision-making strategies are still needed because expert advice is not a panacea: decision-makers typically do not take enough advice even from expert advisors, and expert advisors are themselves prone to decision biases such as overconfidence (Bonaccio & Dalal, 2006).

We therefore suggest that decision-makers use the advice-taking process to facilitate the use of these strategies. For example: (1) advisors can serve as Devil's Advocates who help decision-makers "consider the opposite," (2) decision-makers can purposefully select advisors who will base their recommendation on an "outside view," and (3) decision-makers can ask advisors for help in creating linear decision models (e.g., determining relevant factors, judging the importance of these factors and rating each option on each factor).

A fourth potential objection is that decision-makers would automatically use effective decision-making strategies if they are provided with financial incentives contingent on decision effectiveness and/or if they are held socially accountable for

making effective decisions. Yet, research actually suggests that financial incentives and accountability make employees work harder, not smarter—and that incentives and accountability are particularly ineffective at improving performance on complex tasks for which employees do not know the correct strategy (Camerer & Hogarth, 1999; Jenkins, Mitra, Gupta & Shaw, 1998; Larrick, 2004). Moreover, accountability sometimes yields perverse results, such as giving the audience what it wants even at the risk of a suboptimal decision (Larrick, 2004). We therefore suggest that employees be held accountable not for the outcomes of their decisions but rather for using effective strategies when making these decisions.

Hold employees accountable not for the outcomes of their decisions but rather for using effective decision strategies.

Conclusion: A Checklist for Firms

We have seen that intelligence and experience, though helpful, are insufficient for effective decision-making. Effective decision-making requires the use of effective decision strategies. To that end, we have developed a short, evidence-based checklist to help employees use effective strategies when making important decisions. Checklists are useful in helping intelligent, experienced professionals navigate the complex situations they frequently face on the job (Gawande, 2010). For instance, venture capitalists who created formal checklists for human capital valuation after studying past mistakes and lessons from others obtained a return on investment more than twice as high as those who did not create such checklists (Smart, 1999). In

addition, hospitals require health care professionals to use pre-surgery checklists to prevent adverse patient outcomes, and airlines require pilots to use pre-flight checklists to improve passenger safety (Gawande, 2010). In the same way, firms could require all employees who possess considerable decision-making latitude to use (and document the use of) checklists similar to the one provided below before they make important decisions.

Pre-Decision Checklist for an Important Decision

- ✓ Generate several options (alternatives) for your decision.
  - ➢ Be sure to generate at least **2** options (beyond the status quo).
- ✓ Consider the disadvantages of your initially preferred option.
- ✓ Obtain information about similar decisions from the past—and use these decisions to inform your current decision.
  - ➢ Try to identify at least **6** similar decisions.
  - ➢ Try to identify some similar decisions that **failed**.
- ✓ Determine the factors that should influence your decision and then judge the importance of each factor to your decision.
- ✓ Pat yourself on the back. The success of your decision may depend on factors beyond your control. However, by using an effective (and efficient) decision strategy, you have done the best you can!

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Note: Sources for additional background reading are preceded by an asterisk (*).

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