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Improving Decision Making
through Mindfulness

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Abstract

Decisions shape personal and organizational outcomes, and both researchers and practitioners look for ways to enhance decision making prowess. In this chapter, we explore whether and how mindfulness might help at various stages of decision making. We suggest that mindfulness may help notice when a decision should or could be made, increase goal awareness, enhance consistency of the decision with one's fundamental values, facilitate option generation, reduce the sunk cost bias, and help recognize ethical challenges of decisions. We further argue that while mindfulness may diminish the scope of information search, it may also improve the quality of information used to make a decision. It may also reduce confirmation bias and overconfidence, allow decision makers to better differentiate between relevant and irrelevant information, reduce reliance on stereotypes, help appreciate uncertainty and productively deal with it, and reduce illusory pattern detection. Furthermore, mindfulness is likely to facilitate resolving trade-offs and help effectively reconcile intuition with analysis thereby reducing procrastination. Finally, mindful decision makers are more likely to learn to make better decisions over time because they are more open to feedback and less prone to misinterpret it by making self-serving attributions. The potential of mindfulness to improve judgment and decisions provides many promising opportunities for future research.

Keywords: Mindfulness; Decision Making; Judgment; Awareness; Biases.

Improving Decision Making through Mindfulness

“Most men's awareness doesn't extend past their dinner plates.”

Scott Westerfeld,

Leviathan

With perhaps a few exceptions per day, we are seldom fully aware of our thoughts, actions, emotions, and of what is happening around us. Even when it comes to making decisions, an activity that is often quite conscious, deliberate and intentional, people are typically not as aware as they could be. We argue that as a result, decision quality may suffer. Consequently, *mindfulness*, most often defined as the state of being openly attentive to and aware of what is taking place in the present, both internally and externally (e.g., Brown & Ryan, 2003; Kabat-Zinn, 1982, 1990; see also Chapter 3 of this volume), can help people make better decisions. Making judgments and decisions is a fundamental human activity in both personal and organizational contexts. Decisions hold the potential for great gains: marrying the right person, accepting a job that fits well, putting one's savings into the right investments, or choosing the appropriate strategy for an organization. Decisions also hold the potential for great loss, pain, and suffering. Wrong decisions can destroy people, families, and organizations. People are haunted by rumination, even depression, looking back with regret at some of the decisions they made. Organizations are also a place of great decision blunders, such as the “merger” between Daimler Benz and Chrysler, or Coca Cola's decision to introduce New Coke.

Decision research has generally painted a rather bleak picture of individual and organizational decision making capabilities, compiling a long list of biases (i.e., systematic errors) and problems such as overconfidence, confirmation bias, or the sunk cost bias (Kahneman, 2011). Arguably, errors are partly due to the daunting difficulty of decision

making: the need to process large amounts of information with limited capacity and time, the need to be clear about one's values and objectives, and the need to make difficult trade-offs. We believe that if mindfulness helps even to a small extent to improve decision making, individuals and organizations stand to gain considerable accumulated benefits.

In this chapter, we explore various ways in which being mindful may affect our decisions. The questions we ask include: Does mindfulness help us recognize decision opportunities? Does it influence how we frame decisions? Can it make us more decisive and reduce decision deferral and decision avoidance? Does it lead to more ethical decisions? Can it help us appreciate uncertainty while allowing us to make decisions in the face of it? Might it facilitate the resolution of trade-offs? Does mindfulness reduce or increase intuitive biases in information processing?

With research in this area being still in its nascent phase, our main objective in this chapter is to think through possible effects and mechanisms of mindfulness in decision making and outline directions for future studies. We postulate that the concept of mindfulness traverses many of the diverse phenomena studied in judgment and decision making research. Although we invite readers to remain open-minded about possible adverse effects of mindfulness, we admit to believing that mindfulness holds great potential to improve human judgment and decision making in both personal and organizational contexts. Paradoxically, even though mindfulness is conceived as encompassing an attitude of non-judgment, we argue that it leads to better judgment – precisely by helping us to be less judgmental. Similarly, even though mindfulness entails an observing, witnessing stance that may be thought to imply passiveness, we explore the possibility that by reducing habitual, reactive behaviors, mindfulness may increase self-determination and thus ultimately be associated with *less* decision avoidance and *more choiceful* behavior.

We organized this chapter by decision process stages. Broadly speaking, a decision making process involves four stages: (1) framing the decision, (2) gathering and processing information, (3) coming to conclusions, and (4) learning from feedback (e.g., Russo & Schoemaker, 2002). In what follows, we will think through the different ways mindfulness may be helpful (or not) at each stage of the decision making process. The elements of decision making that we consider at each stage are summarized in Figure 1.

Insert Figure 1 about here

During this journey, we will draw considerably on the metacognitive aspect of mindfulness whereby the emphasis is less on *what* is going on at the present moment but more on the individual's *awareness of*, or *noticing*, whatever is happening, both externally (i.e., in the environment) and internally (i.e., own thoughts, sensations, emotions). In other words, mindful decision making implies the ability to take a step back and to see oneself from a "balcony" – that is, the ability to maintain a certain distance from one's own thoughts and emotions and witness them impartially, without being fully absorbed by them (also referred to as *decentering* or *reperceiving*; Kabat-Zinn, 1990; Shapiro, Carlson, Astin, & Freedman, 2006; Teasdale et al., 2002).

Importantly, making every decision with conscious involvement such as when to breath in and to breath out or when to lift a leg to make a step forward would not be an efficient use of one's limited mental resources (Bargh & Chartrand, 1999). However, the importance of seeing oneself and the situation from the metaphorical "balcony" arguably rises dramatically with the importance and complexity of the decision to be made. Related evidence from a study conducted with nuclear power plant operators suggests that task complexity moderates the effect of mindfulness on task performance (Zhang, Ding, Li, & Wu, 2013). Dispositional mindfulness (as measured by the Freiburg Mindfulness Inventory, Walach, Buchheld,

Buttenmüller, Kleinknecht, & Schmidt, 2006) was found to be associated with better individual performance in complex but not simple tasks. In the latter, mindfulness may delay task execution. Apart from personal “big” decisions such as deciding which degree or career to pursue, which country and city to live in, as well as partner- and family-related decisions, we believe that many public policy and managerial decisions, including strategic decisions, fall under the category of complex decisions involving high-magnitude and/or long-lasting broad consequences, and thus can potentially be improved through mindfulness.

Framing the Decision

Decision framing is arguably the most important, foundational, aspect of decision making, yet it is often not given due attention by decision makers (Russo & Schoemaker, 2002). If a decision is framed poorly, even good execution will typically not lead to good results. We discuss the following aspects of decision framing that may be influenced by mindfulness: noticing when a decision should or could be made and when not, clarifying objectives and generating options, avoiding irrational escalation of commitment and the sunk cost bias, and recognizing ethical dimensions of decisions.

Realizing there is a decision to be made. Arguably, framing the problem starts with the realization that a decision exists. We posit that, to the extent that individuals and organizations are mindless, their judgments and choices are more habitual and reactive as opposed to proactive, and they are less likely to notice that there is a decision to be made. As a result, actors are likely to continue with the status quo, potentially missing important decision problems or opportunities. In contrast, mindfulness may enable actors to notice decision opportunities arise and actually *make a choice*, rather than just continuing with the status quo, or whatever they have been doing so far, which may not represent the best option going forward. Mindful decision makers are capable of recognizing their habitual reactions to

certain “triggers” (e.g., conflict situation, angry customer) and by doing so, are less likely to act automatically according to pre-established behavioral scripts. Consequently, they are more likely to perceive more choice and sense more freedom and self-determination in choosing their actions. Indeed, practicing mindfulness increases a sense of *choicefulness* (Brown & Ryan, 2003).

Knowing what you want and option generation. Decisions are often driven by the available options. For example, a headhunter may call a manager about a position, or a company is approached about an investment opportunity. Making choices between the option presented and the status quo exemplifies an option-driven approach to decision making. However, a more effective way to approach decisions is to start from understanding one’s values and objectives, or goals, and from that clarity generate and consider options to achieve these objectives. Keeney (1994) argued that such a value-focused approach to decision making helps expand the set of options and leads to better decision outcomes, i.e., outcomes that achieve one’s fundamental objectives. We argue that because mindful individuals are more aware of their values, needs, and goals, they are less reactive to situational cues (Brown, Ryan, & Creswell, 2007) and are more likely to approach situations as opportunities to fulfill their fundamental objectives. Moreover, recent evidence suggests that mindful individuals are more concerned with *internal* as opposed to *external* rewards such as an outward image they create of themselves (Ruedy & Schweitzer, 2010). This implies that mindful individuals are more likely to focus on the objectives they value *themselves* as opposed to socially desirable or acceptable objectives, such as status or success which may not lead to satisfaction of fundamental objectives such as wellbeing.

As a consequence of these processes, less mindful decision makers may be more likely to experience *post-decision regret* (Festinger & Walster, 1964), which occurs when people realize the course of action they have chosen brought them somewhere they do not feel

comfortable at or somewhere they – themselves – do not really want to be. Because less mindful decision makers are less conscious of their internal objectives at the moment of making a decision, they may also be more likely to change their decisions frequently.

Mindfulness may also prevent premature and narrow problem definition. The “beginner’s mind,” associated with the open, non-judging aspect of mindfulness (Brown & Ryan, 2003; Kabat-Zinn, 1990), implies that the present moment is approached without pre-determined views about what to do, but instead with a curiosity that can lead to a deeper examination of the decision situation. This in turn can lead to reframing completely the decision to be made so that this specific decision is viewed as a path within a more complete picture of a series of interdependent decisions, all linked by a common thread or objective. In general, inasmuch as mindfulness is associated with creativity (see Chapter 8), it should lead to generating more, more novel, and higher quality options. As the quality of options in the choice set has a strong influence on decision outcomes, this indirect effect of mindfulness can be of substantial practical importance.

Overall, mindfulness is likely to increase the number and quality of options being considered and help generate options proactively rather than only passively reacting to given options. We also posit that more mindful decision makers are more focused on pursuing their fundamental objectives. On the other side, mindfulness may hinder decision making if, as a consequence of a greater number of objectives considered by the individual, s/he is not capable of differentiating between less and more important objectives, and, as a consequence of a greater number of options considered, s/he is not capable of choosing one. In such cases, mindfulness may increase vacillation between options and slow down decision making or, in extreme cases, lead to decision paralysis. (We will come back to this question below when discussing how mindfulness may affect one’s ability to make trade-offs.) On a related note, given that mindfulness implies heightened attention to the present, it is possible that

mindfulness leads to giving priority to present rather than long-term objectives. Future studies should thus examine how mindfulness is linked to option generation, goal awareness, reliance on internal as opposed to externally defined goals and on present as opposed to long-term goals, post-decision regret, and decision reversals.

Prioritizing decisions. Mindfulness may also help decision makers differentiate between *necessary* and *unnecessary* decisions and thus allow redirecting the energy wasted on unnecessary, avoidable decisions to the necessary and important ones. In particular, sometimes decisions are made just because others (or the decision maker her/himself) expect the individual to “do something.” In organizations, for example, newly hired managers are often expected to take action, to change something, when they start their mandate. Because mindfulness is linked to greater clarity and awareness of both the environment and one’s own objectives, mindful decision makers will likely notice the social pressures to make a decision, but not necessarily act on them. As a consequence, more time will be dedicated to assessing the issues that do require action to ensure achievement of organizational objectives.

Similarly, mindfulness may help individuals realize when they spend too much time on “micro decisions,” that is the decisions that have little if any consequence for their fundamental objectives and wellbeing in general. Such understanding will in turn liberate attentional and cognitive resources for more important, consequential decisions as well as reduce anxiety associated with a sense of being overwhelmed by decisions to be made.

Reverting a failing course of action. While we have argued above that mindfulness should lead to greater consistency across one’s decisions because of a heightened salience of one’s values and goals, mindfulness may also introduce some apparent inconsistency in decision making. In particular, mindfulness may help individuals realize when to discontinue a formerly chosen course of action. The phenomenon of *irrational escalation of commitment* and the related *sunk cost bias* make individuals persist in a failing course of action, project,

career, or relationship not because a careful cost-benefit analysis suggests that it is the wise thing to do, but because they have already heavily invested in the course of action, emotionally, financially, or time-wise, and are unable to let go of the sunk costs (Arkes & Blumer, 1985; Staw, 1976).

Hafenbrack, Kinias, and Barsade (2013) have recently suggested that because mindfulness involves awareness of the *present* moment, mindful individuals are less likely to be fixated on sunk costs – incurred in the *past* – and less likely to experience anticipated *future* regret for giving up on the previously chosen course of action. Consequently, mindfulness should reduce the proneness to honor sunk costs. In support of this hypothesis, Hafenbrack and colleagues found that both dispositional (as measured by the Mindful Attention Awareness Scale (MAAS), Brown & Ryan, 2003) and momentarily induced (through a brief 15-minute breathing meditation exercise) mindfulness was positively related to letting go of sunk costs. Further, the effect was mediated by decreased focus on the past and future and consequently decreased state negative affect.

We believe that yet another process may contribute to the effect of mindfulness on irrational escalation of commitment. Staw and Ross (1978) argued that self-image concerns enhance the resistance to see sunk costs as actually sunk. When new evidence suggests the previously made decision should be changed, an individual may experience *cognitive dissonance* (Festinger, 1957) since revising a failing course of action implies recognizing that one was possibly wrong in the first place. To protect their self-image, less mindful individuals may be more likely to filter and interpret information in an overly optimistic manner to maintain the mistaken belief that the chosen course of action was indeed the right one. In contrast, mindful individuals are more likely to notice their personal “attachment” to past decisions and the uncomfortable feelings the criticism of these decisions generates. By reducing ego-involvement (Heppner et al., 2008; Lakey, Kernis, Heppner, & Lance, 2008),

mindfulness may diminish the sense of threat to self-esteem and help individuals tolerate these uncomfortable emotions or eliminate them altogether (Eifert & Heffner, 2003). Consequently, mindful individuals will be able to recognize when a course of action has failed and avoid further escalation of commitment without construing the reversal as a personal failure. Future studies could examine the possible mediating role of self-image concerns in the effect of mindfulness on proactively reverting commitment to a failing course of action.

Recognizing ethical challenges. Another aspect of decision framing concerns whether the ethical aspects of a decision are being recognized. We suggest that mindfulness should help individuals recognize the ethical implications of the decisions they face, which might go unnoticed when decision makers act “on autopilot.” The notion of *bounded ethicality* whereby people act unethically without being aware of it (Bazerman & Moore, 2009; Chugh, Bazerman, & Banaji, 2005) is consistent with the idea that heightened awareness is positively linked to ethicality. In support of this idea, research suggests a positive link between self-awareness and honesty (Bateson, Nettle, & Roberts, 2006; Diener & Wallbom, 1976; Haley & Fessler, 2005). Preliminary evidence in mindfulness research is also suggestive of a positive link between mindfulness and ethicality. For example, Ruedy and Schweitzer (2010) showed that mindful individuals are more aware of their ethical principles, more concerned about preserving their integrity, and engage less in unethical behavior (in their study: cheating) than individuals scoring low on dispositional mindfulness (as measured by MAAS). Thus, more mindful decision makers may be less blinded by instrumental considerations such as financial consequences of a decision (see also Rest, 1986) and more likely to act in accordance with their ethical/moral values.

An implication of the heightened ability to notice when one is about to do something that goes against one’s personal values is that mindfulness might be closely linked to

authenticity, defined as “the unobstructed operation of one’s true, or core, self in one’s daily enterprise” (Kernis & Goldman, 2006, p. 294). Consistent with this suggestion, dispositional mindfulness (as measured by MAAS) has indeed been shown to correlate with dispositional authenticity (Lakey et al., 2008).

Nevertheless, it is not completely clear whether mindfulness is inherently connected to ethics. One can argue that mindfulness may facilitate antisocial decisions when these are aligned with one’s antisocial values. However, preliminary evidence on both dispositional mindfulness (Beitel, Ferrer, & Cecero, 2005) and mindfulness practice (Shapiro, Schwartz, & Bonner, 1998) suggests that mindfulness enhances empathy and concern for others (Atkins, 2013). The effect might be due to the reverse relationship between mindfulness and ego-concerns (Heppner et al., 2008; Lakey et al., 2008). A natural consequence of the enhanced empathy and concern for others is that mindful decision makers should be more likely to incorporate others’ interests into their choices and thus make balanced (as opposed to self-centered) and comprehensive decisions aligned with a broad set of criteria. Further, recent evidence suggests that even brief mindfulness training improves working memory (Zeidan, Johnson, Diamond, David, & Goolkasian, 2010). This may allow mindful decision makers to remain aware of multiple objectives, rather than focusing on a single selfish objective.

In line with these ideas, Brown and Kasser (2005) showed that dispositional mindfulness (as measured by MAAS) is positively linked to ecologically responsible behaviors in diet, transportation, and housing choices. Future studies should examine directly the link between mindfulness, the extent to which individuals incorporate others’ interests into their decisions, and the propensity to notice ethical challenges and make ethical choices. The potential of momentarily induced mindfulness and mindfulness training in this domain is especially promising for uncovering ways of increasing prosocial and ethical choices.

Gathering and Processing Information

At this second stage of decision making, information about relevant options is being collected and processed. Two important aspects of this stage are of particular relevance to mindfulness: the quantity and the quality of information being collected and processed.

Scope of information search. Because mindfulness involves heightened attention (Kabat-Zinn, 1990) and because attention is a limited cognitive resource (Simon, 1945; Hogarth, 1987; Hogarth, 2001), mindfulness may leave less attentional resources for information search and therefore be associated with *less* extensive information search. In turn, less extensive information search implies higher chances that a relevant piece of evidence is overlooked and, as a result, the quality of the final decision may suffer. At the same time, research on decision heuristics, or cognitive shortcuts, shows that less information does not necessarily mean that the quality of a judgment or a decision is compromised and under certain circumstances, less may actually be more (e.g., Gigerenzer & Goldstein, 1996; Hogarth & Karelaia, 2007; Karelaia, 2006). Moreover, onerous information search may increase negative affect during the process, make decision makers rely more on external criteria to differentiate between what is important and what is not, and as a result, reduce their satisfaction with the final choice (Iyengar, Wells, & Schwartz, 2006). Thus, while mindfulness may be associated with less extensive information search, the overall effect on decision quality is unclear.

Confirmation seeking and overconfidence. On the other side, mindfulness is likely to be positively linked to the *quality* of information being used to make a decision. Because mindfulness involves open-minded awareness and observation (Brown & Ryan, 2003; Kabat-Zinn, 1990), mindful individuals are likely to assess information neutrally rather than filter it through their “lenses,” which may be biased due to past experiences, cognitive limitations, and/or motivational biases. In support of this idea, Kiken and Shook (2011) found that

mindfulness reduces negativity bias, or the tendency to weigh negative information more heavily than positive information.

We posit that mindfulness is negatively associated with *confirmation seeking* whereby decision makers selectively use information that confirms their initial thoughts and preferences (Bruner, Goodnow, & Austin, 1956; Klayman & Ha, 1987). By the same token, it seems plausible that mindful decision makers are more likely to recognize the limits of their knowledge, acknowledge that they might be mistaken, and thus manifest less *overconfidence* in their judgments and predictions than the general population, which has been shown to be notoriously overconfident across a wide range of domains (e.g., Klayman, Soll, González-Vallejo, & Barlas, 1999; Moore & Healy, 2008; Zacharakis & Shepherd, 2001).

Being mindful implies shifting how one relates to one's thinking and experiencing into the direction of non-attachment and realizing that any thought and feeling, including the uncomfortable thought that one might be wrong, is non-permanent and transitional (Kabat-Zinn, 1990). Consistent with this idea, mindfulness has been shown to reduce the fixation on protecting or enhancing self-esteem and to reduce ego-involvement (Heppner et al., 2008; Lakey et al., 2008). As a consequence, mindfulness should make it more likely that decision makers recognize and accept the possibility of being wrong. In turn, this should reduce the propensity to filter out information for the sake of maintaining a positive self-view at the cost of biasing judgment and lowering decision quality. In support of this idea, Lakey, Campbell, Brown, and Goodie (2007) showed that dispositional mindfulness (as measured by the MAAS) was negatively associated with overconfidence (as measured by individual calibration in a general knowledge task).

Further studies should provide additional evidence on the link between mindfulness and overconfidence in various domains as well as shed light on the mechanisms underlying such a link. It is important to note that positive illusions such as overconfidence can be functional in

the sense that they promote action and task persistence (Taylor & Brown, 1988). Given that mindfulness may lead to a less overconfident self-view, future studies should examine whether this reduction in cognitive bias (e.g., in prediction) also leads to low confidence concerning action (e.g., when a decision is being implemented or when one tries to convince others (Anderson & Kilduff, 2009; Russo & Shoemaker, 1992).

Differentiating between relevant and irrelevant information. Mindfulness can also increase the quality of information used for making a decision by helping decision makers to separate relevant information from irrelevant. If relevant information is used, whatever heuristics decision makers employ will often lead to decision outcomes comparable with those made by a more sophisticated decision process (Hogarth & Karelaia, 2007). A heightened ability to separate relevant information from irrelevant should also increase decision makers' ability to recognize when their judgment is blurred by stereotypes. For example, managers who have to select someone for promotion are often unaware how their implicit gender, age, or racial biases influence decisions (e.g., Banaji, 2001; Rudman & Borgida, 1995). They can also be blind to how ex-post rationalizations make the decision appear perfectly reasonable and justifiable and thereby reduce their sense of responsibility (Bandura, 1999). Mindful managers, however, may be more likely to defer immediate judgment and be more conscious of how certain personal characteristics of the candidate such as gender, age, or race, can bias assessment of candidates' performance, skill, and potential. Hodgins and Knee (2002) similarly proposed that individuals who are open to the present moment are less likely to show in-group biases and rely on stereotypic information when forming judgments. Exploring the link between dispositional and temporarily induced mindfulness and stereotyping – both implicit and explicit – seems to be a fruitful and important direction for further research.

The above discussion also suggests that despite its contemplative and non-judgmental nature, mindfulness might lead to more proactive, rather than passive, information search because mindful awareness should increase the likelihood that decision makers recognize when important information is missing and then actively search this information.

Appreciating uncertainty. An important aspect of the knowledge gathering stage is the appraisal of relevant uncertainties. A significant body of research shows that people often underestimate uncertainty associated with outcomes of their decisions (Kahneman, Slovic, & Tversky, 1982). On the one hand, through its focus on the present, mindfulness may reduce decision makers' ability to imagine how things can unfold in the future. Arguably, in some contexts, pessimistically playing out future scenarios (e.g., a lawyer or a manager thinking of everything that might go wrong) can improve decision making. On the other hand, it is also plausible that through its link with unbiased (or at least *less* biased) information processing (Brown et al., 2007; Kiken & Shook, 2011) mindfulness may help decision makers become more aware of uncertainty surrounding them. In addition, we posit that mindfulness prevents individuals from being paralyzed in the face of uncertainty. High *intolerance of uncertainty* inhibits action leading consequently to decision delays or decision paralysis (Berenbaum, Bredemeier, & Thompson, 2008; Birrell, Meares, Wilkinson, & Freeston, 2011). Mindful awareness may help individuals recognize that their unease is caused by the perceived uncertainty associated with the decision and, further, observe their feelings with a sense of detachment, thereby reducing associated anxiety (Brown & Ryan, 2003; Hofmann, Sawyer, Witt, & Oh, 2010). These processes should result in making a (better) decision. Preliminary data we collected suggest that dispositional intolerance of uncertainty (Buhr & Dugas, 2002) is indeed negatively associated with dispositional mindfulness (MAAS), $r = -.35$, $p < .01$, $n = 78$. Further research is needed to better understand how mindfulness may help appraise

uncertainty fully, deal with the negative affective states associated with it, and to act in the face of uncertainty.

High perceived uncertainty may also lead to excessive information search (Buhr & Dugas, 2002; Tallis, Eysenck, & Mathews, 1991) whereby individuals engage in data gathering beyond any reasonable level in an attempt to increase a sense of control or to avoid making a decision altogether. Mindfulness is likely to help decision makers recognize instances when they are involved in such unproductive data gathering and then channel their energy and time to more productive activities.

A related question is whether mindfulness may decrease *illusory pattern detection*. Whitson and Galinsky (2008) suggested that identification of illusory correlations in data is especially likely when significant randomness in the environment reduces a sense of control and increases the need for structure. In one of their experiments, participants were more likely to detect a false pattern in the information about a company in which they had a possibility to invest when the market was described as volatile as compared to when it was described as stable. It seems plausible that if mindfulness helps individuals to tolerate uncertainty better, mindful individuals should be less likely to detect false patterns and thus more likely to base their decisions on unbiased interpretations of data. On the other side, since mindfulness implies giving extraordinary attention to the present, it could lead to seeing *more* connections between events, actions, thoughts, and emotions, and thus ultimately increase the propensity to see false patterns. Future studies will allow for better understanding of the link between mindfulness and illusory pattern detection.

A more general related question is whether mindfulness might be linked to more risk seeking. On the one hand, it may – if it leads to greater recognition and acceptance of uncertainty as unavoidable. On the other hand, if mindfulness reduces defensive denial of uncertainty, it may lead instead to more prudent decision making. Recent evidence suggests

that among frequent gamblers, people with higher dispositional mindfulness take less risk in an experimental gambling task (Lahey et al., 2007). Lahey and colleagues note however that risk taking in their study was not linked to any tangible consequence for participants. Future research is needed to better understand the effect of dispositional as well as temporarily induced mindfulness on the extent to which people are ready to embrace uncertainty across different domains, as well as the mechanisms behind such an effect.

Coming to Conclusions

Reconciling intuition and analysis. At this stage of decision making, a conclusion is drawn as to which course of action is chosen and then implemented. Such conclusions can be the product of deliberate, logical analysis or can be intuitively reached through a less conscious process. While good judgment and decision making requires using both intuition and systematic analysis (Hogarth, 2001), we believe that mindfulness can be especially helpful when intuition suggests a course of action different from the one favored by analysis. In such situations, it may be desirable to examine closely the discrepancy between intuition and deliberation, rather than ignoring one or the other.

One's intuitive judgment may be misaligned with the analytical solution because something in the current situation reminds the decision maker of a similar experience or situation and thus triggers an implicit reaction, which the decision maker is (yet) unable to explain. When the decision to be made is in the domain in which the individual has extensive expertise, the intuition is likely to provide a valid – and fast – input to the decision. However, intuitive judgment may not be of high quality when such domain-specific expertise is lacking (Hogarth, 2001). It seems plausible that mindfulness should help decision makers (1) be more aware of the instances when their intuition suggests a decision different from the solution

emerging from the analytical appraisal of the situation and (2) evaluate whether this intuitive judgment is likely to be valid.

Making trade-offs. Choosing one course of action requires making trade-offs if none of the generated options dominates the other available options. Trade-offs make decision making especially challenging (Luce, Bettman, & Payne, 1997). Struggling to make trade-offs may lead to indecision whereby decision makers reduce the negative affect associated with missing out on something in exchange for something else by postponing the decision or avoiding it altogether (Luce, 1998; Tversky & Shafir, 1992). Decision deferral and avoidance are indeed widespread (Anderson, 2003). Because mindfulness involves a non-judgmental attitude and because making trade-offs requires making judgments with regard to attributes that characterize alternatives, one could argue that mindfulness should reduce the ability to make trade-offs. Similarly, as pointed out above, because mindfulness makes it more likely that the decision maker is aware of multiple objectives as opposed to a single goal, it may increase vacillation and doubt.

However, there are also reasons to expect the opposite. First, mindfulness is linked to emotional self-awareness, and being able to recognize one's emotions and see them as information helps in making trade-offs and is positively related to decisiveness (Damasio, 1994; Dulewicz & Higgs, 1999). Second, mindfulness is likely to help decision makers regulate emotions triggered by the conflict associated with making trade-offs: observing emotions as an ever-changing flow allows one to disassociate from them and thereby experience them with a greater ease, no matter how uncomfortable the emotions are (Eifert & Heffner, 2003). Consequently, making a choice should become easier. Finally, as we have argued above, mindfulness should be associated with a heightened awareness of one's values and priorities. Value awareness can also help in making trade-offs by increasing the clarity regarding which attributes are important in a given situation (Anderson, 2003).

An important trade-off dimension is intertemporal whereby immediate benefits and costs have to be traded off with future benefits and costs. Given its present orientation, mindfulness may lead to more discounting of future consequences, resulting in choices that favor the present over the future. On the other side, as mindfulness is related to better emotional and behavioral self-regulation (Arch & Craske, 2006; Brown et al., 2007; Goodall, Trejnowska, & Darling, 2012; Lakey et al., 2007), it may also enable decision makers to forgo immediate gratification in exchange for higher future benefits. The evidence to date from delayed gratification research suggests that the ability to self-regulate in situations involving intertemporal trade-offs is developed in early childhood and is linked to superior coping competencies, academic achievement, and other positive outcomes later in life (Shoda, Mischel, & Peake, 1990; cf. Kidda, Palmeria, & Aslina, 2013). The potential role of mindfulness training in tuning one's ability to delay immediate gratification and make intertemporal choices clearly deserves scholars' attention.

Implementing decisions. Once a decision is made, it has to be implemented. We have argued above that being mindful helps decision makers factor their objectives into their decisions. As a consequence, mindful decision makers should be less likely to revert their choices and more likely to implement them. On the other side, because mindfulness implies taking an observing, witnessing, and possibly accepting stance, it may slow down or altogether prevent implementation through a more passive stance. However, it has also been argued that mindfulness should not be construed as inaction but as a process that precedes action. In particular, Salzberg (2011) suggested that an action is only possible when the current state is appraised and a need for change is recognized, and this is where mindfulness is especially helpful. While much remains to be done to understand how mindfulness is linked to decision implementation, recent research suggests that mindfulness may indeed help translate intentions into actions. For instance, Chatzisarantis and Hagger (2007) showed that

dispositional mindfulness (MAAS) moderated the intention-behavior gap in a leisure-time physical activity context such that more mindful individuals were more likely to align their behavior with their intentions.

Learning from Feedback

This last stage of decision making is arguably the most important for improving one's decision making prowess in the long run and yet, paradoxically, it is often neglected by decision makers (Russo & Schoemaker, 2002). Learning from past decisions, refining the decision making process, and "educating intuition" (Hogarth, 2001) is facilitated if the decision maker (1) has access to complete, quick, and accurate feedback on the outcomes of past decisions *and* (2) processes this feedback unbiasedly.

Awareness of learning structures and openness to feedback. Because of heightened awareness, mindful individuals may be more likely to recognize when the *learning structure* of their decision environment (Hogarth, 2001) is not conducive to learning. This is the case, for instance, when individuals have access to the feedback on the chosen course of action but are oblivious to the consequences of the foregone course(s) of action (e.g., the applicant hired versus the applicants not hired), or when the outcome is a sum of both individual skill and effort and other factors such as luck (e.g., successfully investing in the stock market). Being more aware of the limitations of available feedback, mindful individuals may be more likely to actively seek for missing feedback and correct for noise and other factors when interpreting feedback.

However, awareness of feedback limitations is not sufficient for effective learning. To learn from experience, individuals have to be open and receptive to whatever information they receive about their performance/outcomes, including negative information. We propose that mindfulness is related to more openness to feedback, especially negative one. One reason

behind high reactivity to positive and negative feedback is chronically high ego-involvement (Kernis, 2003). When self-esteem is fragile and contingent on external reinforcement, any negative feedback or experience becomes potentially self-threatening. Because mindfulness is a state of open-mindedness and non-evaluative awareness, mindful individuals, as noted above, experience less ego-involvement and are better able to disengage from self-concerns (Brown et al., 2007; Heppner et al., 2008). Consequently, they are less likely to experience negative feedback as self-threatening and thus are more likely to be open to it (Heppner & Kernis, 2007) and to see all facts as “friendly” (Rogers, 1961, p. 25). These arguments imply that mindful individuals are more likely to accept both positive and negative feedback and proactively look for feedback on their decisions. As a consequence, they will be more likely to refine their judgment, improve their future decisions, and ultimately improve their intuition.

Self-serving attributions and learning. We further suggest that mindfulness is related to unbiased processing of feedback information. It is well documented that individuals often misinterpret outcome feedback. The *self-serving bias* (Miller & Ross, 1975) in attributions of causality refers to the widespread tendency to attribute successes to internal factors such as skill and judgment while attributing failure to external factors such as “bad luck.” One reason for the self-serving bias is the need to enhance personal self-worth (Shepperd, Malone, & Sweeny, 2008), and the self-serving attributions of success and failure can be aggravated by ego-involvement (Miller, 1976). Because mindfulness reduces ego-involvement, mindful individuals should be less likely to make self-protective biased causal attributions of their successes and failures. Hodgins and Knee (2002) made a similar argument by suggesting that openness to ongoing experience (which characterizes mindfulness) results in less cognitive defensiveness, including the self-serving bias. This reasoning implies that mindful individuals are less likely to develop unjustified overconfidence in their skill and decision making ability

after a series of past successes and are more likely to remain humble when facing new decision problems. Future studies should examine directly how mindfulness is related to feedback interpretation, the self-serving attribution bias, overconfidence, and learning in repeated decisions.

Conclusion

While few of us are fully mindful of what is happening in the present moment, the good news is that the potential for improvement is huge. Mindfulness does not only have a positive effect on health and wellbeing, but also, as we have discussed in this chapter, is likely to improve one's ability to make high-quality judgments and decisions. The many avenues for future research discussed in this chapter have high potential for addressing a recent call for more studies on how to reduce biases in judgment and improve decision making (Milkman, Chugh, & Bazerman, 2009).

We have proposed that mindfulness can help individuals at each stage of decision making (Russo & Schoemaker, 2002). At the stage of *decision framing*, mindfulness is likely to increase one's awareness of the possibility (or the necessity) to make a decision and mitigate the sunk cost bias. It may also increase goal awareness thereby enhancing decision consistency with one's objectives and reducing post-decision regret. Greater goal clarity will in turn facilitate option generation, which will be further enhanced by creativity that mindfulness is likely to spark. Importantly, mindfulness is also likely to facilitate the recognition of ethical challenges and thereby reduce the instances of bounded ethicality (Chugh et al., 2005). Moreover, by increasing awareness of one's values and making it more likely that individuals consider how their decisions can affect others, mindfulness has the potential to increase the ethicality of decisions (e.g., Ruedy & Schweitzer, 2010).

At the stage of *information gathering and processing*, mindfulness may reduce the scope of information search and simultaneously increase the quality of information considered. In particular, mindful individuals are likely to be less prone to confirmation-seeking and overconfidence (e.g., Lakey et al., 2007), have a better ability to separate relevant from irrelevant information, and rely less on stereotypes. Furthermore, we posit that mindful individuals are more likely to objectively assess uncertainty and productively work with it. Mindfulness also has the potential to reduce illusory pattern detection, although more research is clearly needed to shed further light on these effects.

At the *coming to conclusions* stage, when the decision maker has to choose a course of action, mindfulness can help by improving one's ability to use both intuition and analysis to reach a decision, even when the two systems suggest different choices. Moreover, making trade-offs should be easier for more mindful decision makers, which will reduce decision deferral and decision avoidance. Mindfulness is also likely to facilitate decision implementation by reducing the intention-behavior gap (Chatzisarantis & Hagger, 2007).

Finally, mindful decision makers are more likely to *learn from feedback* and, importantly, learn the right lessons. First, they are more likely to recognize when feedback is missing or noisy. Second, because they are more capable of disengaging from ego-concerns (Brown et al., 2007; Heppner et al., 2008), they are more open to both positive and negative feedback and less prone to misinterpret feedback by making self-serving attributions.

As we have discussed, mindfulness may be relevant to many diverse phenomena affecting human judgment and decision making. As our arguments make it clear, we believe that overall, mindfulness has a great potential to improve the quality of judgment and decision making, both in personal and organizational contexts. However, one has to be cautious and consider potential adverse effects of mindfulness on judgment and decision making, as well as possible boundary conditions. For example, as noted above, although

mindfulness is likely to increase the *quality* of information considered for making a decision, it may also reduce the *quantity* of information screened. In some circumstances, limited information search may lead to overlooking important decision considerations and underestimating relevant uncertainties. While the “less-is-more” literature suggests that less information does not necessarily mean worse judgment (e.g., Gigerenzer & Goldstein, 1996; Hogarth & Karelaia, 2007), more studies are needed to understand whether mindfulness indeed reduces the quantity of information considered for a decision, and if so, whether the total *quantity* and *quality* effect of mindfulness is negative or positive.

Furthermore, because mindfulness is linked to observing and attending to details, it may slow down decision making. True, appraising one’s objectives fully, considering a wide range of options, attending to all information including that contained in one’s emotions takes time. We acknowledge that the trade-off between decision speed and decision quality is not easy to quantify. What should be valued more will largely depend on the context. However, we believe that although mindfulness may slow down the *decision making process*, it may also allow decision makers to “catch up” at the *decision implementation* stage. Because a decision made mindfully is more likely to reflect fundamental values and objectives, mindful decision makers will be less likely to oscillate between the chosen and forgone options and change their minds after the decision has been made. Moreover, because mindfulness increases the chances that others’ goals are taken into consideration, relevant other parties are less likely to interfere with decision implementation. Furthermore, we have also argued that mindfulness may in fact be positively linked to decisiveness and help individuals to make faster decisions by, for example, increasing one’s awareness and ability to deal with intuition/analysis conflicts as well as facilitating trade-offs between attributes that characterize alternatives. In any case, future studies should directly examine the link between mindfulness and the speed of decision making.

Much work remains to be done to better understand the effects of mindfulness on decision making, as well as the mediating processes, but the richness of the issues to be explored seem to warrant much future research in this domain. We encourage scholars to consider the effects of not only dispositional mindfulness but also of temporarily induced mindful states, mindfulness interventions, and regular, long-term mindfulness practice. We find it inspiring that mindfulness is not a fixed personality trait but an inherent human capacity that may be enhanced through practice. A significant body of research points to the effectiveness of mindfulness training (Brown et al., 2007). Furthermore, many studies quoted above have assessed the effects of either temporarily induced mindfulness or brief mindfulness training (e.g., Brown & Ryan, 2003; Hafenbrack et al., 2013; Lakey et al., 2008; Zeidan et al., 2010). We hope many more studies will soon explore the potential of mindfulness training and interventions to improve judgment and decision making prowess.

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Figure 1

Decision making stages and elements for which mindfulness may matter

Framing the decision	Gathering information	Coming to conclusions	Learning from feedback
<ul style="list-style-type: none">• Seeing a decision opportunity• Goal awareness• Option generation• Avoiding irrational escalation of commitment• Recognizing ethical dilemmas	<ul style="list-style-type: none">• Scope of information search• Confirmation seeking and overconfidence• Relevant vs. irrelevant information• Appreciating uncertainty	<ul style="list-style-type: none">• Reconciling intuition and analysis• Making trade-offs• Decision implementation	<ul style="list-style-type: none">• Awareness of learning structures• Openness to feedback• Self-serving attributions

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