EMPOWERING PEOPLE TO CHOOSE WISELY VIA MINDFULNESS AND THINKING TOOLS*

PETER H. HUANG**

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* Thanks for helpful comments, discussions, and suggestions to Debra Austin, Doris Cheung, Erik Gerding, Mark Loewenstein, Kate Mayer Mangan, Scott Peppet, Leonard Riskin, Lauren Willis, audience members at the Ethics Scholar in Residence presentation of the Academy of Legal Studies in Business conference, the Southern Economic Association conference, the University of Colorado Department of Psychology & Neuroscience Social Psychology Brownbag, the University of Colorado Law School Works-in-Progress workshop, and the Western Economic Association International conference.

** Professor and DeMuth Chair of Business Law, University of Colorado Law School. J.D., Stanford Law School; Ph.D., Harvard University; A.B., Princeton University.
Abstract: Making (good) decisions can be complicated; demand focused, cognitive attention; generate delayed, noisy feedback; require careful and clear thinking; and quite often trigger anxiety, stress, or strong, negative emotions. A large body of empirical, experimental, and field research finds that people often make choices resulting in outcomes that are suboptimal according to the people making those choices. These studies have led to the popularity of the idea of nudging people to achieve better outcomes by changing how choices and information are framed and presented. Choice architecture and information architecture implicitly or explicitly assume that people’s decision-making processes are immutable or too costly to improve and so fail to improve people’s decision-making.

This Article advocates that law and policy can and should empower people to choose wisely for themselves by educating people about practicing mindfulness and utilizing thinking architecture and thinking technologies. Mindfulness involves paying attention in a deliberate way to life as it unfolds moment to moment. Mindfulness is currently very popular in American business, culture, and even sports. Much of that popularity focuses on how mindfulness can improve mental and physical health by reducing stress and negative affect. This Article applies corporate finance theory to explain that mindfulness offers people real options to make decisions after people process information concerning their feelings, thoughts, and bodily sensations. This Article analyzes research that explains how practicing mindfulness can improve people’s decision-making. Thinking architecture offers a systematic procedure to split up a complex problem into a sequence of cognitively easier thinking steps that can result in making better choices. Thinking technologies involve computer or digital technologies to assist people in their thinking. Examples of novel, fun thinking technologies include financial entertainment computer video games, such as one where a player is a vampire managing a blood bar and planning for retirement, and video adventure games designed to teach players to recognize and mitigate their cognitive biases.
INTRODUCTION

A notable scene from the well-known movie Indiana Jones and the Last Crusade graphically shows how choosing poorly can result in horrible consequences and how mindfulness and thinking can result in choosing wisely to achieve desirable consequences.¹ Tragedies in life and fiction often result from mindlessness and poor thinking causing people and characters to choose poorly. People often face choices that are complex, stressful, and require careful thinking. Examples of such choices include decisions about health, healthcare, spending, investing, and retirement savings and planning. Many empirical, experimental, and field studies in behavioral economics find that decision-making contexts often unconsciously influence people’s decisions.² These findings underlie the idea of choice architecture, which involves the design of choice contexts to influence people’s choices.³ Behavioral economics also finds that people often make decision errors due to unconscious cognitive biases.⁴ There is field and laboratory experimental evidence that people display systematic cognitive biases and hold incorrect beliefs in many settings.⁵ As one economist stated: there is “a great deal of evidence of large and costly errors that people make in important choices.”⁶ This research underlies the popular idea of nudges, which acknowledge or even use cognitive biases to design choice contexts to influence choices in ways that result in outcomes that mitigate decision errors.⁷

The quality of people’s decisions can be assessed according to multiple criteria. Two established criteria are:¹⁸ (1) whether people’s decisions are coherent with normative standards of internal consistency, such as transitivity of preferences or Bayes’ theorem, and (2) whether people’s decisions correspond with reality. A third criterion asks if people’s decisions attain their goals.⁹ This Article adopts this goal attainment criterion of assessing decisions. In other words, people’s decisions are assessed by how well their decisions achieve their own subjective goals, be that money, happiness, satisfaction, meaning, or something else. Another possible criterion asks if people’s decisions are socially desirable. This Article will also consider this criterion at specific points.¹⁰

¹ The Bat Channel, Indiana Jones and the Last Crusade (1989): Choosing the Holy Grail (whole scene), YouTube (Jan. 18, 2015), https://www.youtube.com/watch?v=puo1En9h5k (displaying edited video-clip from Indiana Jones and the Last Crusade (Paramount Pictures 1989)).
² Daniel Kahneman, Thinking, Fast and Slow 109-265 (2011) (surveying this research).
⁴ Id., at 83.
⁶ Andrei Shleifer, Psychologists at the Gate: A Review of Daniel Kahneman’s Thinking Fast and Slow, 50 J. Econ. Literature 1080, 1081 (2012).
¹⁰ See infra pp. 28-30.
Utilizing the criterion of subjective goal attainment, decision errors are clearly costly. Increases in information (and noise), time pressure constraints, simultaneous decision-making, globalization, and information-based economies all imply that decision errors will become costlier for "individuals, families, businesses, governments, and societies. ... After all, errors induced by biases in judgment lead decision makers to undersave for retirement, engage in needless conflict, marry the wrong partners, accept the wrong jobs, and wrongly invade countries.”

In addition to monetary costs of decision errors, there are psychological and emotional costs to decision errors and even to decision-making processes themselves.

A fundamental issue that people and societies face is whether people are choosing poorly or wisely. If choosing poorly leads to individually undesirable outcomes, there are negative consequences for those people and their families and even for societies if societal resources must be allocated to deal with the individually undesirable outcomes of those choices. Such negative externalities provide a standard justification for government intervention. As with people’s health, preventive care is often cheaper and more effective than remedial medicine. Although decision-making is often judged by financial outcomes, this is neither always possible nor desirable because of luck and market-wide systemic risks in financial outcomes.

In light of the evidence that people often make what they consider to be decision errors, societies face a fundamental question, namely how should societies respond to people’s decision errors? How societies answer this central question depends on to what extent “self-reflection, experience, learning, feedback, routines, assistance, supervision, oversight, and a full array of punishment and rewards” can overcome the presence and extent of cognitive errors.

As mentioned above, the ideas of choice architecture and nudges are received much attention recently as policy responses to people’s decision errors. In an insightful user’s guide to debiasing, decision researchers and professors Jack B. Soll, Katherine L. Milkman, and John W. Payne divide paths to improving decisions into these two general categories: “(1) modifying the person through either education or the provision of strategies and tools, and (2) modifying the environment a decision maker faces to facilitate wiser choices.” The first approach equips “people with some combination of knowledge and tools to help them overcome their limitations and dispositions. This approach draws upon classic debiasing research on the benefits of education as well as thinking strategies, rules of thumb, and more formal decision aids that people can be taught to use.” Educating people about practicing mindfulness and utilizing thinking tools illustrate the first approach. The second approach changes the choice setting “in a way that either encourages better strategies or is a better match for the decision strategies that people naturally apply. This approach accepts there is a bias, but strives to create situations in which a bias is either irrelevant or may even be

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14 Id. at 17.
15 Id. at 1-2.
Choice architecture and nudges exemplify the second approach, which may even use one bias to combat another bias. Proponents of modifying decision makers are more optimistic about people’s abilities and motivations to learn decision-making skills than proponents of modifying decision environments.\(^{17}\)

A famous episode of the iconic Star Trek: The Original Series, Space Seed,\(^{18}\) introduced a fictional character named Khan, who was a genetically engineered superhuman, who became the central villain in the movie Star Trek II.\(^{19}\) Khan argues to Captain Kirk that genetically modified, improved, and enhanced humans are superior to unmodified humans equipped with modified, improved, and enhanced technology. In comparing modifying decision makers to modifying decision environments, we do not have to deal with the ethical, legal, and social issues that genetic engineering raises.\(^{20}\) Also, some modifications of decision makers utilize novel technologies. Modifying decision makers can be substitutes or complements to modifying decision environments. Finally, some interventions are classifiable as modifying decision makers and/or modifying decision environments. For example, Soll, Milkman, and Payne describe checklists as examples of both modifying decision makers and modifying decision environments through nudges to induce reflection.\(^{21}\)

An explicit or implicit assumption of choice architecture and nudges is that people have fixed skills in making choices or educating people to improve their decision-making is futile or too costly to be worthwhile. Choice architecture and nudges are often contrasted with and touted as being cheaper than and requiring less effort of laypeople and policymakers than educating people or traditional economic policies. For example, psychologists Elke U. Weber and Eric J. Johnson state: “standard economic analysis suggests rather expensive government interventions (such as tax incentives) or effortful (for both provider and recipient) public education.”\(^{22}\)

Although choice architecture and nudges are low-cost or low-effort interventions, choice architecture and nudges can also be low-benefit or low-reward interventions in the sense that choice architecture and nudges do not have learning benefits and rewards that can potentially spillover to many other choice situations. This Article advocates policies to foster people adopting growth mindsets,\(^{23}\) as opposed to fixed mindsets, about their decision-making skills to create a learning society\(^{24}\) and a learning economy,\(^{25}\) which are both inherently linked to democracy.\(^{26}\) Being optimistic about one’s ability to change and learn facilitates learning.\(^{27}\)

\(^{16}\) Id. at 2.

\(^{17}\) Michael Bond, Risk School, 461 Nature 1189, 1189-92 (Oct. 29, 2009) (reporting about proponents of educating people versus nudging them).


\(^{19}\) Star Trek II: The Wrath of Khan (Paramount Pictures 1982).

\(^{20}\) See, e.g., Peter H. Huang, Herd Behavior in Designer Genes, 34 Wake Forest L. Rev. 639 (1999).

\(^{21}\) Soll et al., supra note 13, at 9, 15-16.


\(^{25}\) Id. at 47-87.

\(^{26}\) Id. at 466-67.

\(^{27}\) Richard E. Nisbett, Intelligence and How to Get It: Why Schools and Cultures Count (2010).
Conversely being pessimistic about one’s ability to change and learn impedes learning.\(^{28}\)

Improving decision-making by Americans addresses many current and future challenges to U.S. democracy by improving U.S. economic competitiveness, education, health, healthcare, innovation, jobs, living standards, productivity, profits, and well-being.\(^{29}\) One reason people make decision errors is a lack of thinking carefully and clearly, which makes people vulnerable to impulsiveness, short-sightedness, neglect of probabilities, and other cognitive biases.\(^{30}\)

This Article advocates that societies can and should empower people to choose wisely by educating people about (1) practicing mindfulness to create real options that facilitate their autonomy, (2) utilizing thinking architecture, which is “a structured process that allows us to break down a complex problem, such as what to do in retirement, into a series of manageable thinking steps, so as to improve outcomes,”\(^{31}\) and (3) employing thinking technologies that help people think better.

In the first film of Star Wars original trilogy,\(^{32}\) Obi-Wan Kenobi famously says “[t]hese aren’t the droids you’re looking for” and explains that “[t]he Force can have a strong influence on the weak-minded.” In the final film of Star Wars original trilogy,\(^{33}\) Jabba the Hutt scolds his major domo Bib Fortuna for Bib’s susceptibility to a Jedi mind trick.\(^{34}\) Luke Skywalker performs on Bib. Mindfulness and thinking tools are cognitive methods that people can deploy to counter and repel the attempts of any business, group, organization, or person intending to deceive or defraud people by using mind tricks.

The rest of this Article is organized as follows. Part I of this Article analyzes empowering people to choose wisely through educating people about ways to improve their decision-making processes versus nudging people towards better choice outcomes without improving people’s decision-making processes. Part II of this Article analyzes how mindfulness can improve decision-making by providing real options in any situation to consciously, deliberatively, and thoughtfully respond instead of automatically, reflexively, and unconsciously react. Part II of this Article extends a recent application of real-options theory\(^{35}\) analyzing how improving mindfulness fosters legal ethics and professionalism.\(^{36}\) That analysis is the first application of real-options theory from modern corporate financial economics to analyze the value of mindfulness. Part II of this Article also considers numerous other ways in which mindfulness


\(^{31}\) SHLOMO BENARTZI WITH ROGER LEWIN, THINKING SMARTER: SEVEN STEPS TO YOUR FULFILLING RETIREMENT...AND LIFE 5 (2015).

\(^{32}\) STAR WARS: EPISODE IV – A NEW HOPE (Lucasfilm Ltd. 1977).

\(^{33}\) STAR WARS: EPISODE VI - RETURN OF THE JEDI (Lucasfilm Ltd.1983).


can improve people’s decision-making. Part III of this Article analyzes how people can improve their decision-making by employing two kinds of thinking tools: first thinking architecture that consist of decision heuristics and second thinking technologies that build on behavioral research about how people think and behave on digital screens.37

I. EMPOWERING PEOPLE TO CHOOSE WISELY

People’s actual consumer and financial decision-making often differs from normative models in general and more so in particular markets.38 A large body of empirical and experimental research demonstrates that anticipated and experienced emotions influence financial decisions.39 Many people find managing their household finances emotionally stressful, painful, and unpleasant.40 The empirical finding that people experience household management as having negative affect is important because people are likely to engage in little or suboptimal financial and retirement planning behavior due to procrastination and then rush through household management to minimize their anticipated, experienced, and remembered unpleasantness. Law can and should be designed to make financial decision-making more accessible and available to people who are not financial experts themselves by transforming financial decision-making into less anxiety provoking experiences that are not as cognitively demanding as they are currently.

Recent financial crises, turmoil, and volatility are salient reminders that making financial decisions is a daunting and overwhelming task for most people by themselves and even with assistance from others. There is a financial decision-making information marketplace consisting of advice, books, courses, insurance, investments, online services, planning, and software among other products. In today’s vast financial marketplace, many of us face a dazzling plethora of bewildering financial alternatives. Because we also typically do not like to admit being financially challenged and perplexed, we may end up not only baffled and confused by so


many financial choices, but also not seeking help from professional financial advisors with financial decision-making. When people desire to seek advice, people often are overly trusting and fail to be able to discern the independence and quality of advice. There is experimental psychological research demonstrating that people’s incidental moods affect whether people take advice they receive.41

Empirical survey evidence and experimental data reveal that some people, especially overconfident ones, disregard much relevant and readily available information when making financial decisions.42 Emotional and psychological factors also limit how much some people use relevant information in financial decision-making.43 Empirical field research documents that retail investors avoid stocks whose prior purchase led to negative emotions and rebuy stocks whose prior purchase led to positive emotions.44 People tend to remember information consistent with their preferences and forget information inconsistent with their preferences.45 People often act impulsively and based upon inaccurate beliefs.46 People also face cognitive limitations in processing too much complex information.47 Some people confuse payoff-relevant information with payoff-irrelevant information or noise.48

A branch of microeconomics known as behavioral industrial organization analyzes how markets with imperfectly competitive firms and imperfectly rational consumers result in what are termed “behavioral market failures,”49 such as firms engaging in excessively complex pricing plans and spurious product variety.50 In particular, many consumers exhibit apathy, confusion, context-dependency, dynamic inconsistency, and inertia of decision-making in the markets for cell phones, credit cards, and mortgages.51

A. Some Policy Responses to Decision Errors

One possible response to decision errors is for governments to do nothing based on the belief that over time and with repeated experience people will improve their decision-making.

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41 Francesca Gino et al., Incidental Emotions Influence Advice Seeking and Taking, 102 J. PERSONALITY & SOC. PSYCHOL. 497 (2012); Francesca Gino & Maurice Schweitzer, Blinded by Anger or Feeling the Love How Emotions Influence Advice Taking, 93 J. APPLIED PSYCHOL. 1165 (2008).
45 Garcia, supra note 42.
46 Id.
47 Id.
50 SPIEGLER, supra note 49, at 7, 183-85.
One problem with this reaction is that many decisions (such as marriage and retirement) are infrequent, entail large personal and social costs if incorrectly decided, and provide delayed, limited, and noisy feedback. An analogous philosophy in the realm of parenting, called autonomy-supportive parenting, advocates parents let their kids fail so their kids can learn from such experiences.

One reason that philosopher Mark White is critical of nudges is that nudging shields people from opportunities to make mistakes, learn from them, and in so doing, develop such character virtues as temperance and tenacity. Legal scholars Jonathan Klick and Gregory Mitchell analyze how paternalistic interventions may create cognitive hazards, which “interfere with information searches, educational investments, and feedback that would occur in the absence of paternalistic regulations and that are important to the individual’s development of effective decision-making skills and strategies.” They are concerned that paternalistic policies may restrict learning opportunities and introduce noise into, or mute feedback signals in, learning environments. They are also concerned that paternalistic policies can become self-fulfilling for both laypeople and regulators, leading to further demand for additional future paternalism. They base their analysis upon developmental psychological research indicating “that individuals improve their decision-making skills over time through a “learning by doing” process” and psychologist James Byrnes’ self-regulation model of decision-making. Klick and Mitchell are justified to be concerned that paternalistic interventions and nudges may hinder people from having opportunities to learn from experience about how to make better decisions. In fact, even in the absence of paternalistic interventions, learning how to make better decisions from experience is difficult. More recently, Brynes examines motivational reasons for why people do not apply the effort and time required to engage in critical-analytic thinking.

Although the notion that people can and should learn from experience is intuitively plausible and seems quite reasonable, there are many difficulties with people learning from experience. Some of these difficulties are intrinsic to experience and some are intrinsic to people. Learning from experiences is difficult for humans in part because of the cognitive biases and heuristics that are part of human behavior. Learning from experiences is also difficult because of several intrinsic aspects of the nature of experiences including: complexity of causality in experience, endogenous nature of experience, multiplicity of interpretations about

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55 Id. at 1633.
56 Id. at 1638-41; WHITE, supra note 53, at 122.
57 Klick & Mitchell, supra note 54, at 1626.
60 KAHNEMAN, supra note 2, at 109-265 (surveying this research).
experience, and noisiness of experience.  

61 We learn indirectly from memories of experiences as opposed to directly from ephemeral experiences. Experiences are fleeting and momentary by their very nature. Learning from experience is problematic due to the incomplete and selective nature of people’s memories of their experiences.  

62 Psychological research has found that ex post memories coincide with ex ante predictions instead of interim experiences.  

63 The convergence between memories and expectations means that instead of learning from experience, people learn from selectively reconstructed memories of experiences.

Empirical research has also found that many people, including Masters of Business Administration students, have difficulties with transferring lessons that they have learned in one context to analogous yet novel contexts.  

64 Some law students have similar difficulties with reasoning by analogy to case precedents in the common law.  

March noted “although individuals and organizations are eager to derive intelligence from experience, the inferences stemming from that eagerness are often misguided.”  

66 March’s analysis focused on “some endemic ambiguities and mistakes of experience.”  

67 Experiential learning, currently very popular in legal academia, also enjoyed much popularity recently among organizational scholars.  

69 Although experience is “a useful teacher,” it also is “an imperfect teacher.”

Experience has three conspicuous features that muddle learning from it: vividness, ambiguity, and interpretive flexibility.  

71 Vividness of experience creates dramatic attention, emotional force, and cognitive salience, all of which in turn cause learners to unduly emphasize any information learned from direct and personal experience over that from other information sources.  

73 Ambiguity of lessons from experience results from these five attributes of experience

61 JAMES MARCH, THE AMBIGUITIES OF EXPERIENCE (2010) (examining problems inherent with the process of learning from experience).


63 Norbert Schwarz & Jing Xu, Why Don’t We Learn from Poor Choices? The Consistency of Expectation, Choice, and Memory Clouds the Lessons of Experience, 21 J. CONSUMER PSYCHOL. 142 (2011) (proposing this explanation and providing supporting empirical data in the context of luxury cars).


66 MARCH, supra note 61, at 3.

67 Id. at 3.


69 MARCH, supra note 61, at 9-12.

70 Id. at 101.

71 Id. at 104.

72 Id. at 104.

73 Id. at 104-06.
that complicate learning: complexity, noisiness, endogeneity, social construction, and scarcity.\textsuperscript{74} Flexibility of interpretations about experience resulting from degrees of freedom inherent in natural language and symbolic abstractions implies that any particular experience will be consistent with multiple alternative lessons.\textsuperscript{75} March concludes that the bottom line about learning from experience is that “[e]xperience may possibly be the best teacher, but it is not a particularly good teacher.”\textsuperscript{76} Because most of what people learn is from other people, the issue of how to determine whom to trust is also critical to effective learning.\textsuperscript{77} In addition to difficulties in learning from direct experiences, there are many other difficulties in learning from others’ experiences.\textsuperscript{78}

That many investors misinterpret and overestimate their prior investment performance is documented and illustrated by empirical surveys of American mutual fund investors\textsuperscript{79} and German online broker investors\textsuperscript{80} in addition to experimental research about Master’s in Business Administration (MBA) students playing an online investment simulation game.\textsuperscript{81} Imperfect emotional and factual memories imply that people will find it difficult to learn from their financial experiences.\textsuperscript{82} Imperfect and incomplete memories of past financial pain imply there are significant limitations to learning from experience which may in turn explain why some people fall prey repeatedly to predatory financing and repeatedly participate in investment scams and securities bubbles. As Swift states,\textsuperscript{83} “But you’ll come back each time you leave, Cause darling I’m a nightmare dressed like a daydream.”

To be clear, the above discussion presents the case for people will have difficulties with improving their decision-making utilizing a particular form of learning, namely learning from experiencing the making of decision errors. This Article therefore advocates other forms of learning to improve people’s decision-making, namely learning about mindfulness, thinking architecture, and thinking technologies.

Research about financial decision-making focuses on particular types of remedies to help

\textsuperscript{74} Id. at 106-09.
\textsuperscript{75} Id. at 110-12.
\textsuperscript{76} Id. at 15.
\textsuperscript{77} \textsc{Paul L. Harris}, Trusting What You’re Told: How Children Learn from Others (2012) (examining the importance of how children and also adults learn primarily from others instead of first hand experience).
\textsuperscript{79} William N. Goetzmann & Nadav Peles, Cognitive Dissonance and Mutual Fund Investors, 20 J. Fin. 145 (1997) (finding that mutual fund investors overestimate their actual past returns and performance relative to whole market).
\textsuperscript{80} Markus Glaser & Martin Weber, Why Inexperienced Investors Do Not Learn: They Do Not Know Their Past Portfolio Performance, 4 Fin. Res. Letters 203 (2007) (concluding that investors do not know or remember their investing mistakes).
\textsuperscript{81} Don A. Moore et al., Positive Illusions and Forecasting Errors in Mutual Fund Investment Decisions, 79 Org. Behav. & Hum. Decision Processes 95 (1999) (finding that most players consistently overestimate past and future performance of their investment portfolios).
\textsuperscript{82} Nofsinger, supra note 39, at 40-45 (summarizing how emotional memory interacts with investment decisions); \textsc{John R. Nofsinger}, Investment Madness: How Psychology Affects Your Investing … AND WHAT TO DO ABOUT IT 100-106 (2001) (same).
\textsuperscript{83} Taylor Swift, Blankspace, TaylorSwiftVEVO, Taylor Swift – Blank Space (Official Video), YouTube (Nov. 10, 2014), \url{https://www.youtube.com/watch?v=e-ORhEE9Vg}. 
improve financial decision-making. Two existing and popular policy responses to financial decision errors are financial literacy education and nudges. Financial literacy education is problematic, having at best limited success and mixed efficacy. One problem is that perceived, instead of actual, financial literacy may drive good financial behavior. Another problem is due to whether financial literacy is manipulated by experimental and quasi-experimental manipulations, or is measured instead by the percentage of correct answers on particular tests of financial knowledge. Professors Daniel Fernandes, John G. Lynch, Jr., and Richard G. Netemeyer conducted a meta-analysis of the relationship of financial literacy and financial education to financial behaviors. They found that interventions to improve financial literacy explained only 0.1% of the variance in financial behaviors that were studied, with weaker effects in low-income samples. The financial behaviors that were studied included putting aside savings for an emergency fund, figuring how much savings is required for retirement, investing in individual stocks or mutual funds, buying savings bonds or other bonds, and not incurring check bouncing fees and late credit card payment fees. As with other types of education, the benefits of financial education also decayed over time. Even a large number of hours of financial education have negligible effects on behavior 20 months or more afterwards. The authors of this research conducted three empirical studies and found “that the partial effects of financial literacy diminish dramatically when one controls for psychological traits that have been omitted in prior research or when one uses an instrument for financial literacy to control for omitted variables.” The four traits analyzed were numeracy, propensity to plan, confidence in information search, and willingness to take investment risks. The instrumental variable used to control for omitted variables was Need for Cognition, “a stable personality trait referring to a person’s tendencies to engage in effortful thought, to entertain and evaluate ideas, and to ignore irrelevant information.”

86 THALER & SUNSTEIN, supra note 3, at 74.
88 Lauren E. Willis, Against Consumer Financial Literacy Education, 94 IOWA L. REV. 197 (2008).
93 Fernandes et al., supra note 91, at 1861, 1866-67.
94 Id. at 1861, 1867, fig.4.
95 Id. at 1861.
96 Id. at 1868.
97 Id. at 1871.
cautioned that:

Our conclusions are about forms of financial education that have been subjected to empirical evaluation. Those wishing to draw policy conclusions from our work must understand that many innovative forms of financial education have never been studied empirically. That said, our findings for the interventions studied so far make clear that different approaches to financial education are required if one expects to produce effects on behavior larger than the very small effects we found.98

A non-profit foundation advocating for consumers, the FoolProof Foundation, has developed a novel and broad form of financial literacy education at its website, FoolProofMe.com,99 which teaches defensive thinking. This foundation also initiated the Walter Cronkite Project,100 which provides a free, turnkey for teachers, advertising-free, and web-based 22-hour financial literacy curriculum, which teaches caution and defensive spending skills. It would be interesting to empirically study these innovative versions of financial literacy education.

Fernandes, Lynch, and Netemeyer also proposed “just in time” financial education tied to help specific behaviors.101 They also suggested teaching “soft skills like propensity to plan, confidence to be proactive, and willingness to take investment risks more than content knowledge about compound interest, bonds, etc.”102 This Article advocates teaching people about mindfulness practice, thinking architecture, and thinking technologies, all of which are or can be linked to such soft skills.

The tool of nudging people has become very popular in certain policy circles.103 Nudges have generated much debate and controversy over their ethical nature.104 Some have argued that some nudges are at best ineffective and at worst even counterproductive.105 Some nudges are

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98 Id. at 1873.
99 http://www.foolproofme.com/about.
100 http://www.foolproofme.com/about/walter-cronkite-project.
101 Id. at 1861, 1867, 1873-75.
102 Id. at 1873.
104 See, e.g., SARAH CONLY, AGAINST AUTONOMY: JUSTIFYING COERCIVE PATERNALISM (2013) (arguing that libertarian paternalism fails to work or is manipulative if and when it does work); FRANCIS H. BUCKLEY, FAIR GOVERNANCE: PATERNALISM AND PERFECTIONISM (2009) (examining justifications for interfering with personal preferences); RICCARDO REBONATO, TAKING LIBERTIES: A CRITICAL EXAMINATION OF LIBERTARIAN PATERNALISM (2012) (contending that libertarian paternalism is deeply manipulative, fraught with unintended consequences, insidious, and does not answer the question of who monitors the government); WHITE, supra note 53, (explaining how libertarian paternalism is coercive and prone to informational, ethical, and practical problems).
quite effective in changing people’s behavior. For example, behavioral economics research finds that inertia is a powerful force in retirement planning,\(^{106}\) implying that automatic enrollment in retirement plans can be a policy default that is very effective in changing people’s behavior.\(^{107}\) Shlomo Benartzi and Richard Thaler designed a concrete program that helps people start and continue to save more based upon research about loss aversion, inertia, and defaults.\(^{108}\) Defaults can be one-size-fits-all or tailored to individuals.\(^{109}\) Defaults may not always work though.\(^{110}\) Disclosure has its limits also,\(^{111}\) even for sophisticated investors.\(^{112}\) Effectiveness of disclosures can be improved by simplifying disclosures, standardizing disclosures, making disclosures more vivid, and mandating that disclosures contain certain comparisons.\(^{113}\)

### B. Empowering People versus Nudging Them

This Article pioneers a cognitive approach to law and economics that draws upon the field of cognitive economics, which is defined as “the economics of what is in people’s minds.”\(^{114}\) Cognitive economics differs from, and is narrower in scope than, behavioral economics,\(^{115}\) which is a field whose name is somewhat of a misnomer.\(^{116}\) The cognitive law and economics of this Article focuses on how and why law can and should improve people’s cognition and in so doing improve people’s decision-making processes. Behavioral law and economics, true to its name, focuses on how and why law can and should change people’s behavior to improve the outcome of their decision-making, without necessarily changing or improving people’s cognition or their decision-making processes.

A central theme of cognitive economics is finite cognition, where cognition is defined as “all of the other operations of the human mind besides the bare recording and accessing of information.”\(^{117}\) The finiteness of cognition “means something more than just imperfect information—it means finite intelligence, imperfect information processing, and decision-

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\(^{107}\) AUOMATIC: CHANGING THE WAY AMERICA SAVES (William G. Gale et al. eds., 2009) (proposing the automatic enrollment of employees in 401(k) plans).


\(^{115}\) Id. at 2, 4.


\(^{117}\) Kimball, supra note 114, at 7.
making that is costly.” Human cognition being finite has “enormous practical consequences and policy implications. In particular, finite cognition implies that even in the absence of externalities, welfare can often be improved by economic education, setting up appropriate default choices for people, or providing disinterested, credible advice.” The notion “that human intelligence is finite—and that finite intelligence matters for economic life—scarce cognition—is not really controversial.”

Financial advisors, accountants, and lawyers are all able to earn livings because people do not have infinite, unlimited intelligence. The same is true of doctors, teachers, professors, and other professionals with specialized knowledge. Among “the most important economic manifestations of finite intelligence is the expensive and time-consuming acquisition of human capital.” Finite cognition also means that people “can’t be expected to recognize and analyze all the aspects in each person, event, and situation.” Thus, finite cognition implies that “people can’t analyze every decision fully; it’s just not possible: people need heuristics to get through life.”

People differ from Keanu Reeves' character, Neo, in the futuristic science fiction movie The Matrix, who stated “I know kung fu” mere seconds after that martial art is uploaded into his brain. Another central theme of cognitive economics is that “[h]eterogeneity across individuals in preferences and cognitive ability is not at all controversial.” A particular implication of this theme is that people differ in how finite their cognition is and how much they enjoy learning. An individual’s willingness to learn depends on whether that individual believes that intelligence is fixed or malleable. Hence the importance of people adopting growth rather than fixed mindsets about decision-making skills.

The central thesis of this Article is related to policies intended to boost people’s decision-making competencies, such as statistical literacy education, identifying and teaching people a limited core of domain-specific factual and procedural knowledge, and designing and disseminating simple cognitive heuristic strategies that support making better decisions. Boost policies are based upon the simple heuristics (SH) research program, which “has aimed to explore the cognitive mechanisms that a boundedly rational decision maker—one operating...
under conditions of limited computational capacity, limited information, and uncertainty—employs to make satisficing, that is, *good enough* decisions.”

The SH program is grounded in ecological rationality theory, which posits that “that simple heuristics are adaptive and that heuristics cause problems mainly when underlying cognitive strategies are mismatched to situations. Consequently, people need to learn to calibrate their strategies to the environment to avoid bad decisions.”

The SH research program differs from the heuristics and biases (H&B) research program, whose researchers have “catalogued a long list of what are widely considered systematic cognitive biases and flawed (e.g., temporally inconsistent) motivations which, they argue, lead to poor choices.” Psychologist Gary Klein, known for pioneering the field of naturalistic decision-making (which studies how people make decisions in demanding, real-world situations) cogently stated about the H&B paradigm that it:

has done a valuable service by identifying some important heuristics that people employ for thinking about complex issues. The classical paradigm—the demonstration that people use heuristics even if they result in errors—is useful and often intuitive. Unfortunately, the paradigm is often misinterpreted as implying that heuristics are always biasing and that everyday thinking is irrational. These extensions are unwarranted, misleading, and counterproductive. They reflect a sort of hyper-rationality bias.

While the SH research program “does not deny that people sometimes make poor decisions. Unlike the H&B program, however, it does not attribute these behaviors to profoundly flawed mental software. Instead, it presents a vision of bounded rationality according to which human reasoning and decision making can be modeled in terms of SH.” In particular, the SH research program acknowledges that “choices detrimental to individual and collective welfare can arise for various reasons, including the use of heuristics in environments that have changed—as a result of which the cognitive strategy no longer interlocks properly with the environmental structures … or the provision of information that is … profoundly confusing.”

Under the H&B research program, “the goal is to design policies, that by co-opting systematic biases, nudge individual behavior toward a different, more beneficial outcome.” In contrast, under the SH research program, “policies should aim to extend the decision-making competencies of laypeople and professionals alike. To this end, interventions can target the individual’s skills and knowledge, the available set of decision tools, or the environment in

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137 Flach et al., *supra* note 135, at 274.
139 *Id.* at 3.
140 *Id.* at 4.
which decisions are made.”

Nudging assumes that “people tend to be somewhat mindless, passive decision makers.”

In contrast, boosting “assumes a decision maker whose competencies can be improved by enriching his or her repertoire of skills and decision tools and/or by restructuring the environment such that existing skills and tools can be more effectively applied.” Therefore although many boosts aim to modify decision-makers, some boosts aim to modify decision environments.

The SH research program does “not deny that people are not perfect thinkers and, at times, make bad decisions (for a variety of reasons). However, the difference to the H&B program is that these difficulties are not assumed to be so impervious to change that they have to be exploited rather than overcome.” The approach of boosting assumes that “these difficulties can be addressed by training, information, education, better decision strategies, and better representations. The nudge approach, in contrast, presupposes that these cognitive deficiencies are difficult or costly to overcome, and therefore recommends their skillful manipulation to facilitate better choices” or more precisely better outcomes being chosen by existing imperfect decision-making processes rather than improving decision-making processes themselves. Boosts and nudges can sometimes overlap in their policy recommendations, such as in the case of judiciously setting defaults. Even when boosts and nudges overlap, the causal mechanisms underlying the rationales for those policies differ. In the case of defaults, proponents of nudges explain how effective defaults are by “inertia, status-quo bias, or the ‘yeah, whatever heuristic” and in so doing are “revealing the policy to be rebiasing.” On the other hand, proponents of boosts explain how effective defaults are by “the implicit recommendation or endorsement effect … describing the behavioral change in response to the default as consisting in a learning effect, and hence revealing the policy to be debiasing.”

More generally, boosts and nudges differ in their underlying assumptions about what cognitive errors they intend to counteract, their policy goals, characteristics of people they intend to help, and characteristics of policymakers. Nudging does not assume that people have awareness or controllability of cognitive errors, while boosting assumes that people can detect and mitigate cognitive errors. Nudging assumes that policymakers have information about people’s goals or the distribution of people’s goals in the presence of goal heterogeneity, while boosting does not require such strong informational assumptions. Nudging assumes that policymakers are less cognitively error-prone than laypeople and are benevolent, while

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141 Id. at 4.
142 Thaler & Sunstein, supra note 3, at 37.
144 Soll et al., supra note 13, at 1.
145 Id. at 1.
146 Grüne-Yanoff & Hertwig, supra note 128, at 15.
147 Id. at 15.
148 Id. at 15.
149 Id. at 15.
150 Thaler & Sunstein supra note 3, at 83.
151 Grüne-Yanoff & Hertwig, supra note 128, at 15.
152 Id. at 15.
153 Id. at 15-16, tbl.1.
154 Id. at 16-17.
155 Id. at 17-18.
boosting does not make such assumptions about policymakers’ cognition or motivation. Finally, boosting assumes that people are able to acquire trained skills and motivated to utilize trained skills, while nudging does not make such assumptions about people’s abilities and motivations.

Philosopher Till Grüne-Yanoff and psychologist Ralph Hertwig compare to what degree the H&B and SH research programs about bounded rationality (or more neutrally, finite cognition) support the above necessary underlying policy assumptions of nudges and boosts respectively. Grüne-Yanoff and Hertwig concluded that while the H&B research program does not imply all of the policy assumptions underlying nudging and the SH research program does not imply all of the policy assumptions underlying boosting, there is a greater partial disconnect between nudging and the H&B research program compared to boosting and the SH research program. They also concluded that “criticism that nudge policies infringe on human autonomy and dignity do not apply (or applies less) to boost policies.”

This Article advocates empowering people to choose wisely for themselves by practicing mindfulness and utilizing thinking architecture and thinking technologies. Mindfulness, thinking architecture, and thinking technologies can all be viewed as boosts in the sense of “empowering people by expanding (boosting) their competencies and thus helping them to reach their objectives (without making undue assumptions about what those objectives are).”

From such a perspective, thisArticle differs from Grüne-Yanoff and Hertwig’s analysis of boosts generally in 1) the specific boosts that this Article proposes and 2) all the boosts that this Article proposes aim to transform people into better decision-makers by expanding their portfolios of decision-making abilities, information, and tools. While Grüne-Yanoff and Hertwig advocate teaching financial literacy, in light of the empirical research demonstrating that “[f]inancial education as studied to date has serious limitations that have been masked by the apparently larger effects in correlational studies,” this Article considers novels ways of motivating people to acquire and utilize financial skills, such as utilizing financial entertainment computer video games to help people learn basic financial skills and utilizing serious games to help people learn about cognitive biases and improve their decision-making. The play aspect of both of these categories of games may also make it more likely that people are both able to acquire trained skills and motivated to utilize trained skills. Finally, there is already much empirical and experimental experience demonstrating that diverse audiences can and are motivated to acquire and utilize the skills of practicing various forms of mindfulness.

This Article advocates educating people to choose wisely for themselves by effectively thinking more mindfully and systematically. Education entails the provision of information. A

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156 Id. at 18-19.
157 Id. at 19-20.
158 Kimball, supra note 114, at 8 n.3.
160 Id. at 26-27.
161 Id. at 28.
162 Id. at 8.
163 Id. at 11.
164 Fernandes et al., supra note 91, at 1861.
165 See infra Part III.B.
166 See infra Part III.B.
A complementary way to think about information is that it is an aid to forming judgments and making decisions. Information is what economists term a public good, meaning that its consumption exhibits aspects of non-exclusion and non-rivalry. It is difficult to exclude someone from information and more than one person can use the same piece of information simultaneously. The production of information tends to have high fixed costs and low marginal costs of distribution, reproduction, or utilization. Many problems exist with markets for public goods as opposed to private goods for which there is both exclusion and rivalry in consumption. Such market failures explain why many public goods, such as information, are publicly provided by government expenditures and funded through taxation.

In other words, private actors may not find it in their best interests to educate people to choose wisely because they may find it more profitable to exploit people’s cognitive biases or they may not able to capture all of the benefits that they would provide by educating people as some of those benefits are uncertain, delayed, and spillover into other domains. Even in situations where private actors may find it in their best interests to educate people to choose wisely, there are still affordability, distributional, equity, fairness, and social reasons for governments to provide such education. Finally, there are positive externalities to educating people to choose wisely (such as better citizenship, voting, marriages, physical health, and mental health) and correspondingly negative externalities to not educating people to choose wisely (when governments have to use tax dollars to deal with the individual and societal consequences of poor individual decision-making).

Lengthened retirement periods and changing U.S. demographics resulting from aging heighten the importance of improving decision-making because older Americans are particularly vulnerable to financial decision errors. Defaulting people into 401(k) retirement plans exemplifies the idea of mitigating decision errors by what is known as soft paternalism, which includes libertarian paternalism that preserves freedom of choice, while influencing choices to make people better off; asymmetric paternalism that produces large benefits for those prone to decision-making errors, while imposing small costs on those not so prone; cautious paternalism that requires policymakers to determine precise conditions under which...

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168 Sumit Agarwal et al., The Age of Reason: Financial Decisions over the Life-Cycle with Implications for Regulation, BROOKINGS PAPERS ECON. ACTIVITY, Fall 2009, at 51, 55-78 (providing medical, psychological, and financial evidence of this), 80-90 (discussing nine possible regulatory responses); Tibor Besedes et al., Age Effects and Heuristics in Decision Making, 94 REV. ECON. & STAT. 580, 580 (2012) (finding in controlled experiments mimicking selecting a retirement savings plan that probabilities of making the optimal choice declined more for older subjects and older subjects relied more on suboptimal decision rules); Tibor Besedes et al., Decision-Making Strategies and Performance Among Seniors, 81 J. ECON. BEHAV. & ORG. 524, 524 (2012) (finding in paper and pencil experiments at senior centers that performance significantly declined with age due to reduced reliance on common heuristics and increased decision-making randomness among the oldest subjects).


benefits outweigh costs;\textsuperscript{172} and light paternalism that enhances individual choice without restricting it.\textsuperscript{173}

All the above types of soft paternalism share the common feature of modifying the decision-making contexts that people face in order to improve the outcomes resulting from people’s unmodified, existing decision-making.\textsuperscript{174} None of these forms of soft paternalism attempts to improve the actual process of people’s decision-making. Each of these versions of soft paternalism is therefore open to legal scholar and philosopher Jeremy Waldron’s criticism:

“Choice architects nudge almost everything I choose and do, and this is complemented by the independent activity of marketers and salesmen, who nudge furiously for their own benefit. I’m not sure I want to live in a nudge-world, though – as a notoriously poor chooser - I appreciate the good-hearted and intelligent efforts of choice architects such as Sunstein to make my autonomous life a little better. I wish, though, that I could be made a better chooser rather than having someone on high take advantage (even for my own benefit) of my current thoughtlessness and my shabby intuitions.”\textsuperscript{175}

A new type of soft paternalism, known as autonomy-enhancing paternalism (AEP), aims to “support individuals’ ability to make autonomous decisions,”\textsuperscript{176} defining autonomy\textsuperscript{177} as “the capacity of a person to reflect upon, and then attempt to accept or change his or her preferences, desires, values, and ideals.”\textsuperscript{178} AEP “acknowledges that behavioral interventions can – and typically will – change the strength of decision-making anomalies over time, and favors those interventions that improve, rather than reduce, individuals’ ability to make critically reflected, unbiased, autonomous decisions.”\textsuperscript{179} AEP advocates “using behavioral insights to modify the choice architecture in a way that promotes critical reflection”\textsuperscript{180} and focuses on “helping individuals to become better decision-makers; it aims to improve well-being through improving the processes of decision-making. This is in contrast with other forms of soft paternalism that aim to improve the outcomes of decision-making processes without concerning themselves with how the decisions come about.”\textsuperscript{181} AEP entails “interventions that change the choice architecture to help individuals to become good decision-makers, who are able to ... make

\begin{thebibliography}{99}
\bibitem{173} George Loewenstein & Emily Celia Harris, \textit{The Economist as Therapist: Methodological Ramifications of “Light” Paternalism, in The Foundations of Positive and Normative Economics: A Handbook} 210 (Andrew Caplin & Andrew Schotter eds., 2008).
\bibitem{174} Soll et al., \textit{supra} note 13, at 1.
\bibitem{177} RONALD DWORIN, \textit{THE THEORY AND PRACTICE OF AUTONOMY} 48 (1988).
\bibitem{178} Binder & Lades, \textit{supra} note 176, at 5.
\bibitem{179} \textit{Id.} at 4.
\bibitem{180} \textit{Id.} at 6.
\bibitem{181} \textit{Id.} at 6.
\end{thebibliography}
critically reflected decisions.”182 AEP realizes that “interventions can influence individuals’ abilities to learn about both their cognitive biases and their preferences”183 and “prefers cognitive learning over non-cognitive learning because the latter often happens without the individual being aware of it and is thus more open to manipulation and the influence of others.”184 AEP “encourages those behavioral interventions that help individuals to become better decision-makers and thus make better informed, less biased, and more autonomous choices over time that may better reflect their true preferences.”185 AEP transforms choice contexts with a goal of improving people’s decision-making processes.

This Article focuses on additional ways to improve decision-making processes by empowering people to choose wisely through educating people about practicing mindfulness, utilizing thinking architecture, and employing thinking technologies.186 This Article advances the notion of positive parentonomics, extending positive parentalism,187 an original regulatory proposal advocating that policymakers develop institutions to help enable people, communities, and societies to flourish and thrive. Soft paternalism focuses on cognitive biases to modify choice contexts to mitigate decision-making errors by accounting for or even using cognitive biases. Positive parentalism focuses on helping people to learn, develop, and utilize their character strengths and virtues.188 Instead of negative and gendered connotations that come with paternalism and “father knows best,” positive parentalism invokes positive and gender-neutral notions of parenting associated with care, assistance, facilitation, and enabling people to choose wisely for themselves.

Positive parentonomics integrates positive psychology with parentonomics, which is the application of incentives, negotiations, outsourcing, and other ideas from neoclassical economics, behavioral economics, and game theory to solve the important economic management and governance problem that is more commonly known as parenting.189 Positive parentonomics advances a theory of government policy based on an optimistic view of humanity because it believes that people can improve their decision-making skills and focuses on helping people do so in order to lead a meaningful life.190 Positive parentonomics and positive psychology itself, share features with an ancient perspective, known as virtue theory, variously applied in practice as virtue ethics, virtue politics, or virtue jurisprudence. Virtue theory is a normative philosophy that encourages the cultivation of virtue as a life goal.191 Instead of emphasizing consequences, as utilitarian doctrines do, or rights, duties, and rules, as

182 Id. at 6.
183 Id. at 6.
184 Id. at 6.
185 Id. at 6.
190 DACHER KELTNER, BORN TO BE GOOD: THE SCIENCE OF A MEANINGFUL LIFE (2009).
deontological doctrines do, virtue theory focuses on individuals’ character and human excellence. People engage in right action not because it will yield positive consequences or increased welfare, and not because there is some principle mandating or permitting them to do so, but because it is the sort of action that a virtuous person would characteristically or habitually perform. From the perspectives of positive psychology and virtue theory, the aim of law and policy is to encourage citizens to become virtuous, act virtuously, or, at the very least, to establish institutions that allow citizens to acquire virtue on their own. A primary goal of law should be to foster or encourage positive behavior, rather than limit negative behavior.

Positive parentonomics also draws on research about how the East Asian (primarily, though not exclusively Chinese) virtue model of learning envisions that people desire to perfect themselves morally and socially, while the Western mind model of learning strives to have individuals cultivate their minds to understand the world. These two fundamentally different beliefs about learning manifest themselves in the psychology of the learning process and influence views about education and parenting. Positive parentonomics is also related to tiger parenting and responses to it. Positive parentonomics builds on the idea that mainstream American legal education and tiger parenting are similar and both can be improved by fostering life-long learning about character strengths, emotions, and ethics. Positive parentonomics advocates that societies can and should empower people to flourish and thrive by facilitating people learning to make better decisions by fostering people practicing mindfulness, utilizing thinking architecture/strategies/tools, and employing thinking technologies.

To sum up part I of this Article, nudging people in response to people making decision errors is less theoretically coherent with the H&B research program than empowering people is with the SH research program. Also, nudging people raises ethical concerns more than empowering people. Thus, the rest of this Article analyzes particular ways to empower people to make better decisions.

II. MINDFULNESS

One reason that people choose poorly is that people often behave mindlessly and without much awareness, as if their behavior were on automatic pilot. Psychologist Jonathan Baron makes the case “that one main problem with our thinking and decision making is that much of it suffers from a lack of active open-mindedness. We ignore possibilities, evidence, and goals that we ought to consider, and we make inferences in ways that protect our favored ideas.” This problem suggests that having more awareness and mindfulness would help people avoid or mitigate their making bad choices. In common parlance, mindfulness is defined as “the quality

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192 Id. at 181.
195 Huang, supra note 65, at 297 (2012).
or state of being conscious or aware of something.” 197 At least two more technical notions of mindfulness exist: 198 one that is Eastern-derived and is associated with Buddhist religious and spiritual traditions 199 and another one is due to psychologist Ellen Langer. 200

Law professor Leonard Riskin and attorney mediator Rachel Wohl define the Eastern-derived notion of mindfulness that they teach as being aware, conscious, or mindful “in a particular way – deliberately, moment to moment, and without judgment or attachment to whatever passes through the five sense or the mind. Mindfulness, as we generally use the term, means paying attention, with equanimity, to our present experience as it unfolds.” 201 As they note, their definition of mindfulness “is an elaboration of a definition by Jon Kabat-Zinn: Mindfulness can be thought of as a moment-to-moment nonjudgmental awareness, cultivated by paying attention in a specific way, that is, in the present moment, and as non-reactively, as non-judgmentally, and as openheartedly as possible.” 202 In a handout for their course, Tools of Awareness: Mindfulness for Dispute Resolvers, 203 Riskin and Wohl answer the question of what is mindfulness by stating that mindfulness is: “Paying Focused Nonjudgmental Attention on Purpose, in the Present Moment; Observing/Witnessing our Own Thoughts, Bodily Sensations & Emotions with Kindly Curiosity; Observing/Witnessing Others and our Environment with Kindly Curiosity.”

Clinical psychologist Shauna Shapiro states this about the first notion of mindfulness:

It is important to remember that mindfulness is both an outcome (mindful awareness) and a process (mindful practice): (1) Mindful awareness: an abiding presence or awareness, a deep knowing that manifests as freedom of mind (e.g., freedom from reflexive conditioning and delusion), and (2) Mindful practice: the systematic practice of intentionally attending in an open, caring, and discerning way, which involves both knowing and shaping the mind.

A definition that captures both aspects of mindfulness is as follows: The awareness that arises through intentionally attending in an open, accepting, and discerning way to whatever is arising in the present moment. 204

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199 Jon Kabat-Zinn, Coming to Our Senses (2005).
I once co-taught with Yale law school professor Dan Kahan a seminar about neuroscience and law in which we covered the neuroscience of mindfulness meditation. Some students expressed concern about proposals that advocated teaching mindfulness meditation in elementary school. Their concerns were due to neuroscience research findings that mindfulness meditation changes people’s brain structures and functioning. We answered that learning also changes people’s brain structures and functioning. I realized a few years later that although we had assigned our students to read neuroscience articles about mindfulness meditation, we did not lead our students to personally experience mindfulness, meditation, or mindfulness meditation. I wonder if our students would have reacted differently to proposals for teaching mindfulness if they had experienced practicing mindfulness themselves.

The best way to have a sense of what Eastern-derived mindfulness entails is to directly experience it firsthand. This can be accomplished by listening to these three-minute guided meditations: the Body Scan Meditation and the Body and Sound Meditation, both from a free collection of guided meditations, the UCLA Mindfulness Awareness Research Center provides on its website.

Another brief guided mindfulness practice is called 3 Minute Breathing Space, from the UCLA Mindfulness Awareness Research Center.

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207 See, e.g., Christina Congleton et al., Mindfulness Can Literally Change Your Brain, HARV. BUS. REV., Jan. 8, 2015, https://hbr.org/2015/01/mindfulness-can-literally-change-your-brain (discussing some of these neuroscience studies and their implications for the business world); Britta K. Hözel et al., Mindfulness Practice Leads to Increases in Regional Brain Gray Matter Density, 191 PSYCHIATRY RES.: NEUROIMAGING 36, 36-42 (2011) (presenting study details); Rafal Marciniak et al., Effect of Meditation on Cognitive Functions in Context of Aging and Neurodegenerative Diseases, 8 FRONTIERS BEHAV. NEUROSCI. Art. 17 1, 1, 4, 5 tbl.1 (2014) (discussing seven MRI studies finding brain structure changes associated with meditation).

208 See, e.g., Bogdan Draganski et al., Temporal and Spatial Dynamics of Brain Structure Changes during Extensive Learning, 7 J. NEUROSCI. 6314, 6314-17 (2006) (finding that learning a large body of highly abstract information was associated with increased gray matter in specific brain areas of medical students); Johan Mårtensson et al., Growth of Language-related Brain Areas after Foreign Language Learning, 63 NEUROIMAGE 240, 240 (2012) (finding structural changes in brain regions of interpreters during three months of intensively learning a foreign language); Alexander Schlegel et al., The Artist Emerges: Visual Art Learning Alters Neural Structure and Function, 105 NEUROIMAGE 440, 440 (2015) (finding that learning artistic skills in a three month introductory course in drawing or painting changed students’ brain structures and functioning and boosted creativity).


211 http://marc.ucla.edu/body.cfm?id=22.

212 http://marc.ucla.edu/.

213 http://www.umsystem.edu/media/3min_breathingspace.mp3.
University of Missouri Mindfulness Practice Center, which offers students, faculty and staff “a non-sectarian approach to mindfulness that draws on contemplative practices from a variety of traditions.” This guided mindfulness practice asks you to notice your “thoughts as mental events passing across the sky of the mind,” notice “what feelings are present: are you feeling happy or sad, maybe your are feeling content or restless,” and “then noticing what sensations are present in the body, is there tension, relaxation, is there a sense of ease or is there a sense of discomfort?” This guided mindfulness practice also suggests “using the breath as an anchor to bring you into the present.” Often we are not mindful of the present because we are ruminating over what already happened in the past or worrying about what might happen in the future. We should follow Queen Elsa’s advice to herself in the song Let It Go from the movie Frozen in its original version: “I’m never going back. The past is in the past. Let it go! Let it go!” or the simplified pop version: “Standing frozen in the life I’ve chosen, you won't find me. The past is so behind me buried in the snow. Let it go. Let it go.” We should also follow Baz Luhrmann’s advice: “Don't worry about the future, or know that worrying is as effective as trying to solve an algebra equation by chewing bubblegum.”

Psychologist Ellen Langer states this about her notion of mindfulness: “[w]hen we are mindful, we implicitly or explicitly (1) view a situation from several perspectives, (2) see information presented in the situation as novel, (3) attend to context in which we are perceiving the information, and eventually (4) create new categories through which information may be understood.”

Riskin and Wohl analyze how Eastern-derived mindfulness and Langer’s mindfulness can help lawyers and law students more effectively negotiate and resolve conflicts by reducing attention to self-centered concerns; reducing the strength of negative emotions; developing awareness of and freedom from emotions, thoughts, habitual perceptions and behaviors; fostering sensitivity of others’ emotions; and increasing concentration and enhancing social skills. Riskin and Wohl co-developed three tools of awareness to implement mindfulness that are summarized by these mnemonics: STOP, STOPSI, and taking STOCK. All three tools are based upon a common foundation, known as the Triangle of Awareness, namely what Riskin and Wohl call BETs, which stands for Bodily sensations, Emotions, and Thoughts. BETS are what we can be aware of when practicing mindfulness and in so doing choose to have our behavior respond mindfully instead of react mindlessly.

The first of the three tools that Riskin and Wohl co-developed to help people establish and maintain mindfulness in the heat of conflict is the STOP tool: Stop; Take a breath; Observe as a

214 http://www.umsystem.edu/curators/mindfulness.
219 Riskin & Wohl, supra note 201, at 140, fig.1.
220 Id. at 141.
221 Id. at 141-42, fig.2.
222 Id. at 143, fig.3.
compassionate witness your BETs; and Proceed by continuing what you were doing or doing something else.223 The second tool is STOPSi, which is STOP plus the step of Setting Intentions, where an intention concerns how you would like to be during this activity or time.224 So an intention is not a substantive goal of the conflict resolution. Instead, an intention is a goal about your moment-to-moment experience and behavior. Examples of intentions are being attentive, balanced, calm, caring, courageous, kind, mindful, polite, or even ruthless.225 The third tool is taking STOCK: Before the activity, set an intention by utilizing STOPSi; and then during the activity, Stop; Take a breath; Observe BETs; and Consider whether you have been following your intention and whether you would like to change it; and Keep going after you make possible adjustments.226

Much of the current interest and popularity about being more mindful among athletes,227 businesses228 (such as Google229), law schools and lawyers,230 organizations231 (such as the military232), and laypeople233 is due to psychological and neuroscience studies finding that being more mindful improves physical health, mental health, and well-being,234 cultivates emotional intelligence,235 reduces anxiety and stress,236 and improves focus and productivity.237

It is not possible to always be mindful because of finite cognition. Fortunately, “the good news is that the same factors that lead us to make mindless suboptimal or unhealthy choice can

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223 Id. at 144-46, fig.4.
224 Id. at 146-48, fig.5.
225 Id. at 147-48, 150.
226 Id. at 148-52, figs.6 &7 (explaining in detail a basic and an advanced version of this mindfulness tool); Katherine Larkin-Wong, *A Newbie’s Impression: One Student’s Mindfulness Lessons*, 61 J. LEGAL EDUC. 665, 667 (2012) (describing from a law student’s perspective the taking STOCK tool).
often be reversed to help us make a mindless better choice." In other words, people can choose to be mindful in their mindlessness. Professor of marketing Brian Wansink and his co-authors have demonstrated in many studies that people often eat more than they think because they eat mindlessly. One response to such mindless eating is to practice mindful eating. Wansink believes that “[f]or 90 per cent of us, the solution to mindless eating is not mindful eating – our lives are just too crazy and our willpower’s too wimpy.” Instead, Wansink advocates nudges or self-nudges to modify food environments. His ideas are related to psychology professor Angela Duckworth’s proposal that people proactively choose or change the situations they will face to reduce the power of undesirable impulses or increase the power of more desirable impulses. For such matter over mind strategies to succeed, people have to be mindful at an earlier point in time when they choose or modify the matter of their situations, so that they can be mindless later and rely on their established habitual ways of behaving. As Gretchen Rubin observes, “[h]abits are freeing and energizing because they eliminate decision and self-control.” An example of the potential of being mindful about mindlessness is to form the habit of taking off one of your shoes and placing it on the floor of the backseat row near a baby’s child seat so that you will not mindlessly leave that baby locked in your car on a hot summer day because you will have to get your shoe before or soon after leaving your car.

Not surprisingly, there is a backlash towards mainstreaming and marketing a secularized version of mindfulness decoupled from its ethical context and Buddhist religious traditions, as well as concerns over the choice of control groups, research protocols, sample sizes, and other details in some of the neuroscience studies about mindfulness. Recently psychologists Miguel Farias and Catherine Wikholm critically examine research about mindfulness and meditation, cautioning that both practices may have unexpected consequences for some people. An exploratory study, in which organizational behavior students attended a lecture

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239 BRIAN WANSINK, MINDLESS EATING: WHY WE EAT MORE THAN WE THINK (2007); http://mindlesseating.org/.
241 BRIAN WANSINK, SLIM BY DESIGN: MINDLESS EATING SOLUTIONS FOR EVERYDAY LIFE 7 (2014).
242 http://www.slimbydesign.org/.
about mindful awareness including a brief meditation exercise, found no statistically significant change in students’ mindful awareness, as measured by a self-reported questionnaire. This preliminary research suggests that effortful, rigorous, and systematic practice may be required to yield statistically significant changes in mindfulness.

Several scholars have observed that a standard definition of mindfulness as present-centered non-judgmental awareness ignores crucial features of mindfulness in classic Buddhist accounts. Jon Kabat-Zinn distinguishes between being judgmental and being discerning:

I am also making a big distinction between judging which, in the way I am using the term, has to do with black and white thinking – I like this and I don’t like that, that’s good, this is bad – and discernment, which is what you are talking about, which is more the kind of operation of wisdom where you can see the subtleties – the thousand shades of grey between black and white – you know that kind of thing, which is absolutely essential to and part and parcel of the cultivation of mindfulness.

Kabat-Zinn states about being non-judgmental: “you could say, if you wanted a reason for doing it, it’s in the service of self-understanding and the cultivation of wisdom and compassion.”

Buddhist scholar B. Alan Wallace cautions that “[i]t’s incorrect to equate bare attention with mindfulness.” He also distinguishes between right mindfulness and wrong mindfulness or what one might also call mindless mindfulness:

A sniper hiding in the grass, waiting to shoot his enemy, may be quietly aware of whatever arises with each passing moment. But because he is intent on killing, he is practicing wrong mindfulness. In fact, what he’s practicing is bare attention without an ethical component. Generally speaking, right mindfulness has to be integrated with ... introspection involving clear comprehension—and it is only when these two work together that right mindfulness can fulfill its intended purpose. Specifically, in the practice of the Four Applications of Mindfulness, right mindfulness has to occur in the context of the full Noble Eightfold Path: For example, it must be guided by right view, motivated by right intention,

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249 Id. at 150, 154. See also Jo Ann Heydenfeldt et al., Cultivating Mind Fitness Through Mindfulness Training: Applied Neuroscience, 50 PERFORMANCE IMPROVEMENT J. 21, 21, 24 (2011) (same).
251 Interview by Edo Shonin with Jon Kabat-Zinn, This is not McMindfulness by Any Stretch of the Imagination, PSYCHOLOGIST, BRIT. PSYCHOL. SOC., https://thepsychologist.bps.org.uk/not-mcmindfulness-any-stretch-imagination.
252 Id.
grounded in ethics, and be cultivated in conjunction with right effort. Without right view or right intention, one could be practicing bare attention without its ever developing into right mindfulness. So bare attention ... represents only the initial phase in the meditative development of right mindfulness.254

Whether mindfulness leads to more ethical behavior depends upon one’s precise definition of mindfulness and exactly what one is mindful about. If mindfulness is defined as paying attention in a caring, discerning, and open-hearted way, with kindly curiosity to ourselves, others, and our environment, instead of just paying bare attention, then such a definition contains an intention of caring about ourselves, others, and our environment. One can also be narrow or wide in the scope of what one is mindful about:

A soldier may apply mindfulness narrowly to the task of how to most effectively achieve some desired objective by employing military solutions that involve violence. That same soldier may apply mindfulness widely to the task of how to most effectively achieve that same desired objective by utilizing non-military solutions that involve non-violence, such as diplomacy or negotiation. Narrow versus wide applications of mindfulness differ in the focus and scope of actors and activities about which one is mindful. A sufficiently narrow mindfulness can concentrate on constraints or means, while a sufficiently wide mindfulness can include goals or objectives. Narrow enough mindfulness can focus just on means while holding ends fixed and therefore be agnostic over ends. Wide enough mindfulness can pay attention to ends in addition to means to accomplish those ends. Different degrees of mindfulness are akin to concentric circles around the practitioner of mindfulness that include more or less of the world around that practitioner.255

A quote that has been attributed to Albert Einstein illustrates how an expansive kind of mindfulness can lead to greater compassion:

A human being is part of a whole, called by us the ‘Universe,’ a part limited in time and space. He experiences himself, his thoughts and feelings, as something separated from the rest—a kind of optical delusion of his consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and to affection for a few persons nearest us. Our task must be to free ourselves from this prison by widening our circles of compassion to embrace all living creatures and the whole of nature in its beauty.256

If attorneys are indeed led by the practice of mindfulness to adopt more ethical professional

254 Id. at 62-63.
255 Huang, supra note 36, at 64-65.
behavior,\footnote{Leonard L. Riskin, Awareness and Ethics in Dispute Resolution and Law: Why Mindfulness Tends to Foster Ethical Behavior, 50 S. TEX. L. REV. 493, 495, 499 (2009). See also Brian C. Gunie et al., Contemplation and Conversation: Subtle Influences on Moral Decision Making, 55 ACAD. MGMT. J. 13, 13, 16, 22-23 fig.1, 25, 28 (2012) (providing experimental evidence supporting the hypothesis that contemplation leads to more ethical decisions (telling the truth) as compared to immediate choice).} this raises the issue of whether such attorneys will be as zealous advocates as other lawyers who do not practice mindfulness.\footnote{Scott R. Peppet, Can Saints Negotiate? A Brief Introduction to the Problems of Perfect Ethics in Bargaining, 7 HARV. NEGOT. L. REV. 83, 84-90, 96 (questioning if the practice of mindfulness conflicts with being a partisan advocate).} One response is that maximizing zealousness is neither mandated by the rules of professional conduct nor necessarily even an effective way strategically to represent clients because zealousness may provoke zealousness in response by other attorneys. Another response is that being ethical does not mean being less zealous, nor does being zealous mean being unethical. A third response is that mindfulness can foster creativity and in so doing improve the decision-making and problem-solving capabilities of attorneys who practice mindfulness. A final response is that all of the fifteen participants in a qualitative study based on extensive interviews of lawyers who self-identified as having a Buddhist practice “concluded that they are better lawyers because of their Buddhist practices.”\footnote{Deborah J. Cantrell, Can Compassionate Practice Also Be Good Legal Practice?: Answers From the Lives of Buddhist Lawyers, 12 RUTGERS J. L. & RELIGION 1, 5 (2010). See also Ran Kuttner, What Does It Mean to Do the Right Thing?, 10 NV. L.J. 407, 407 (2010) (exploring how mindfulness practice and Buddhist philosophy relate to ethical decision-making).}

A. Mindfulness Creates Real Options to Exercise Autonomy

Riskin\footnote{Riskin, supra note 257, at 499.} cogently describes practicing mindfulness as providing an opportunity to, before acting, insert a “wedge of awareness”\footnote{MATTHEW Flickstein, Swallowing the River Ganges: A Practice Guide to the Path of Purification 28 (2001).} that can provide “the time and resources to make a wise decision.”\footnote{Leonard L. Riskin, The Contemplative Lawyer: On the Potential Contributions of Mindfulness Meditation to Law Students, Lawyers, and Their Clients, 7 HARV. NEGOT. L. REV. 1, 30 (2002).} By pausing and assessing a situation before acting,\footnote{Elisha Goldstein, The Now Effect: How a Mindful Moment Can Change the Rest of Your Life (2012).} mindfulness effectively creates valuable flexibility by allowing its practitioners to exercise what financial economists call “real options”\footnote{Huang, supra note 36, at 65-68 (offering a primer about real options); Joseph A. Grundfest & Peter H. Huang, The Unexpected Value of Litigation: A Real Options Perspective, 58 STAN. L. REV. 1267, 1272-74 (2006) (discussing real options); Peter H. Huang, Lawsuit Abandonment Options in Possibly Frivolous Litigation Games, 23 REV. LITIG. 47, 87-99 (providing another primer about real options).} (which entail real assets and are analogous to such well-known financial options as stock options) to consider more carefully the consequences of making different choices. The central idea of a real options perspective to mindfulness is that mindfulness permits its practitioner to make decisions that after awareness of information about BETs. In so doing, mindfulness provides its practitioner with opportunities to make decisions after seeing how events in life unfold. The value of delaying to act until there is more information available
and utilizing that information before acting can be very large. In the language of system 1 fast thinking and system 2 slow thinking, mindfulness provides its practitioner with real options to let system 2 check, monitor, and possibly correct system 1. In other words, mindfulness allows one to respond thoughtfully instead of react automatically. In the language of simple heuristics, mindfulness provides its practitioner with real options to determine if the decision heuristics being employed are appropriate for the environment one is facing and if not to employ other more appropriate decision heuristics. In both the language of system 1 versus system 2 and that of simple heuristics, mindfulness grants its practitioner options to be free from habitual ways of thinking and behaving. In this way, exercising the real options that mindfulness provides enables people to exercise their autonomy. In the language of Buddhism:

A central teaching of Buddhism is that suffering arises from habitual ways of reacting. Indeed, if we pay attention, it is possible to observe how often our experiences are followed by automatic reactions, thoughts, or actions. Informed by mindfulness, we are granted the option to choose a healthier or more constructive response. When we are able to see clearly beyond our first instincts and automatic reactions, an appropriate response is more likely to arise.

There are a number of qualitative conclusions (known as comparative statics results) concerning how the value of the real option that mindfulness provides its practitioner changes as other variables of possible interest change. A fundamental qualitative result about real options is that the more uncertainty that people face, the more valuable are real options. For example, as the variance of the longevity risk and other risks that retirees face increases, the value of the real options that mindfulness provides in retirement planning increases. Uncertainty and a person’s ability to respond to uncertainty accordingly and flexibly are two key sources of value of the real options that mindfulness provides. The real options that mindfulness provides are less valuable the fewer alternative decisions that a person can make, the less uncertainty that a person faces, and if the consequences of the uncertainty that a person faces can be ignored. Conversely, the real options that mindfulness provides are more valuable the more alternative decisions that a person can make, the more uncertainty that a person faces, and the consequences of the uncertainty that a person faces can not be ignored.

Riskin, in a thoughtful review of a book about improvisation and negotiation, connects improvisation with mindfulness by noting that “mindfulness means essentially saying “Yes” to

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266 KAHNEMAN, supra note 2, at 13.


268 Huang, supra note 36, at 68-71.


270 MICHAEL WHEELER, THE ART OF NEGOTIATION: HOW TO IMPROVISE AGREEMENT IN A CHAOTIC WORLD (2013).
what is actually happening, rather than denying or suppressing or rationalizing it.”

The importance of improvisation to negotiation is a special instance of a more general proposition, namely the general importance of improvising in life. A way to conceptualize what improvisation entails is taking account of available current information and exercising certain real options. Successful improvisation requires accepting the current situation whatever that is and then making choices about how to proceed in light of information about that current reality. The more variance there is, the more valuable are the real options that mindfulness provides to improvise accordingly.

In a poignant scene from the striking movie Never Let Me Go, based upon a novel of the same name, a British boarding school teacher asks her class if they know what happens to children when they grow up. She answers that they do not because nobody knows. Children may grow up to become actors who move to America, supermarket employees, school teachers, athletes, bus conductors, race car drivers, or in fact do just about anything. Notice that the more volatility there is about future labor market conditions, educational opportunities, macroeconomic conditions, and financial market conditions, the more valuable are the real options that mindfulness offers people in their choice of work, careers, or professions. She then explains that no such uncertainty exists about what her students are growing up to become. This is because of their destiny of being created to become donors of their vital organs. In other words, her students lack the many real options that people have over who they become.

In an article that applies the internal family systems model of psychotherapy to conflict resolution, Riskin explains how practicing mindfulness allows one to choose to have “the Self, a center of awareness, compassion, and clarity … lead the Parts and to make decisions,” where one’s sub-personalities or parts of one’s personality are “areas of the personality that are partly-autonomous and resemble and act as if they were individual human beings, having an age, beliefs, interests, perspectives, and the capacity to learn, negotiate, and change.” In other words, mindfulness allows its practitioner to exercise the real option to have the Self lead “even though a Part or Parts often take over one’s consciousness, essentially, though temporarily, restricting the influence of the Self and other Parts.” The more variability there is in how a person’s sub-personalities differ from each other and a person’s Self, the more valuable are the real options that mindfulness provides to have the Self lead and make decisions instead of a particular sub-personality do so.

One of my nephews once was misbehaving, so one of his aunts said to him that he needed a time out. He immediately said that he learned about this in school and that he should hesitate. He meant meditate of course. His misremembering the word meditate as hesitate though captures a crucial aspect of meditating or just taking a few deep breathes and pausing, namely that such a space in time and moment of hesitation provides opportunities to exercise real options to first be more aware of one’s thoughts, feelings, and bodily sensations and then

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271 Riskin, supra note 269, at 620.
272 NEVER LET ME GO (Fox Searchlight Pictures 2010).
273 Kazuo Ishiguro, NEVER LET ME GO (2005).
276 Id. at 65.
277 Id. at 65.
possibly change one’s behavior and in so doing, also change one’s thoughts, feelings, and bodily sensations. The more variability that he has in his repertoire of behavior, the more valuable are the real options that mindfulness provides to reflectively choose a particular course of behavior over other possible courses of behavior.

B. How Mindfulness Can Improve Decision-Making

Recent research finds that mindfulness increases rational decision-making and reduces the impact bias, implicit age/race bias, and sunk-cost bias. Because mindfulness and decision sciences “both focus on attention to thought processes and the exploration of the roots of these cognitions” it should not be surprising that practicing mindfulness can be related to making decisions. In particular, many studies find that people’s mood states can affect their decision-making, “with negative affect and anxiety increasing a person’s tendency toward decision making biases.” Mindfulness practice entails viewing from an accepting and open perspective one’s thoughts, feelings, and bodily sensations. In so doing, mindfulness has been linked to positive affect and helps to reduce negative affect and anxiety. Therefore, one route by which mindfulness can improve people’s decision-making is by improving people’s moods and reducing their anxiety.

Soll, Milkman, and Payne introduce a concept of decision readiness, in which a person’s system 2 thinking is ready to monitor a person’s system 1 thinking, suspend wrong judgments, and correct wrong decisions. Soll, Milkman, and Payne emphasize these determinants of decision readiness: “fatigue and distraction effects that limit capacity, visceral influences related to one’s physical and emotional state, and individual differences in ability and thinking style.” Being mindful addresses each of these aspects of decision readiness because practicing mindfulness should lead people to be aware of their being fatigued or distracted, be aware of visceral influences upon them, and be more likely to adopt a more reflective thinking style.

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279 Amber S. Emanuel et al., *The Role of Mindfulness Facets in Affective Forecasting*, 49 PERSONALITY & INDIVIDUAL DIFFERENCES 815, 816-18 (2010).
283 *Id.* at 168.
284 *Id.* at 168.
286 Soll et al., *supra* note 13, at 4-6.
288 *Id.* at 13.
289 Soll et al., *supra* note 13, at 4.
In a handout for their course, Tools of Awareness: Mindfulness for Dispute Resolvers, Riskin and Wohl define mindfulness meditation as “a form of exercise that strengthens our ability to behave mindfully in our work and personal lives.” Thus, one way mindfulness meditation can improve decision-making is by allowing people to practice and get better at being mindful, which in turn can improve decision-making for all of the reasons discussed above. Another way that mindfulness meditation can improve decision-making is if mindfulness meditation reduces anxiety and stress because there is evidence that “anxiety increases threat perception, which, in turn, results in self-interested unethical behaviors.” There is also evidence that just four days of mindfulness meditation training for twenty minutes per day can improve the ability to sustain attention, executive functioning, working memory, and visual-spatial processing of undergraduates, perhaps as the result of reducing self-reported anxiety and fatigue. More generally, mindfulness meditation can improve people’s decision-making by improving their decision readiness in the same ways that mindfulness can, as the above paragraph explained.

Chair of the American Bar Association's Commission on Lawyer Assistance Programs, Terry Harrell, observes how “the benefits of mindfulness have become a big topic of discussion and education among professional responsibility groups” because “mindfulness practice makes us better decision-makers, better ethical decision-makers. And that translates into better lawyering,” while “[s]tressed-out lawyers make poor decisions, leaving them open to liability.” Acting director of the State Bar of California's Lawyer Assistance Program, Richard Carlton, observes that a “mindfulness practice can be as simple as closing your eyes and counting backward from 100.” A white paper of the American Judges Association advocates that judges practice mindfulness to make better decisions. Supreme Court Justice Stephen Breyer told CNN contributor Amanda Enyati that he pauses for ten to fifteen minutes twice daily:

I don’t know that what I do is meditation, or even whether it has a name. For 10 or 15 minutes twice a day I sit peacefully. I relax and think about nothing or as little as possible. And that is what I’ve done for a couple of years. . . . And really I started because it’s good for my health. My wife said this would be good

290 Riskin & Wohl, supra note 203.
291 Id.
295 Id. at 599, 601, 603.
297 Id.
298 Id.
299 Id.
for your blood pressure and she was right. It really works. I read once that the practice of law is like attempting to drink water from a fire hose. And if you are under stress, meditation - or whatever you choose to call it - helps. Very often I find myself in circumstances that may be considered stressful, say in oral arguments where I have to concentrate very hard for extended periods. If I come back at lunchtime, I sit for 15 minutes and perhaps another 15 minutes later. Doing this makes me feel more peaceful, focused and better able to do my work.301

Decision sciences professor Natalia Karelaia and organizational behavior and human resources professor Jochen Reb recently explored how and when mindfulness can improve people’s decision-making.302 They divided up the process of decision-making into these four stages:303 (1) Decision Framing, (2) Information Gathering and Processing, (3) Making Conclusions, and (4) Learning from Feedback.

In the first stage of decision framing, mindfulness can help people recognize that there is an opportunity to make a decision in the first place, as opposed to behave according to some pre-established script, simply react out of habit, or proceed with the status quo.304 Being mindful can mitigate premature, narrow framing of the decision problem. Having an open and curious beginner’s mind can lead people to initially consider more possible options.305 Rather than passively choosing between just some option that happens to be presented and the status quo, mindfulness facilitates the proactive generation of multiple possible options to achieve one’s true goals. Instead of choice being driven merely by whatever options happen to be available, mindfulness fosters clarity about one’s underlying values that assists in creating and considering novel options and thus choice being driven by those values.306

People who practice mindfulness are more inclined to perceive more choice and sense greater freedom and self-determination.307 People who are mindful about their core values and fundamental goals react less to temporary, situational cues.308 Two laboratory studies found that people who are mindful were more likely to care about such internal rewards as integrity, moral identity, and honesty, as opposed to such external rewards as monetary gains.309

Karelaia and Reb point out how mindfulness could hamper decision-making if additional

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303 Id., at 165, fig.7.1.
304 Id., at 166-67.
305 Id., at 167-68.
options lead to cognitive overload, delay choice, or in the limit cause choice paralysis.\footnote{Karelaia & Reb, supra note 302, at 168.} The focusing of attention to the present moment that mindfulness entails may also result in prioritizing immediate as opposed to long-term goals. A counterpoint is that practicing mindfulness helps people realize that their current thoughts, feelings, and bodily sensations are only fleeting and temporary. This realization should lead people to appreciate that their present goals are likely to change in unpredictable ways. Being more mindful about, empathetic with, and sensitive to people’s future selves may also help people choose wisely regarding their future selves.

Being mindful can also help people discern the difference between important and necessary versus unimportant and unnecessary decisions.\footnote{Id. at 168–69.} Such discernment allows people to prioritize the choices they face and spend limited attentional, cognitive, and economic resources on consequential choices instead of wasting effort, time, and energy on micro-managing their lives. Judiciously focusing on choices that matter also lowers the anxiety from being overwhelmed by having to make too many choices.

Finally, mindfulness can help people realize when they should choose to stop continuing a plan of action.\footnote{Id. at 170.} A correlational and three experimental studies\footnote{Andrew C. Hafenbrack et al., \textit{Debiasing the Mind Through Meditation: Mindfulness and the Sunk Cost Bias}, 25 PSYCHOL. SCI. 369 (2014) (presenting these studies).} found that increased mindfulness meditation reduces irrational escalation of commitment by reducing the related sunk-cost bias,\footnote{Hal R. Arkes & Catherine Blumer, \textit{The Psychology of Sunk Cost}, 35 ORG. BEHAV. & HUM. DECISION PROCESSES 124 (1985) (presenting a field study and questionnaire studies finding the sunk-cost effect).} in which people continue a course of action because of prior unrecoverable expenditures in effort, money, or time. A financial example of the sunk-cost effect is that many people find it hard to sell a stock whose price has dropped.\footnote{Terrance Odean, \textit{Are Investors Reluctant to Realize Their Losses?}, 53 J. FIN. 1775 (1998) (providing empirical evidence that investors hold losing investments too long).} Karelaia and Reb believe that another reason that mindfulness reduces irrational escalation of commitment is that mindfulness reduces ego involvement with and personal attachment to past choices and uncomfortable feelings that result from criticism of past choices.\footnote{Karelaia & Reb, supra note 302, at 168.}

In the second stage of information gathering and processing, mindfulness can affect both the quantity and quality of information that people collect and process.\footnote{Id. at 172.} Economics Nobel laureate Herbert Simon\footnote{http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/1978/simon-bio.html.} famously stated that attention is a scarce resource:

“In an information-rich world, the wealth of information means a dearth of something else: a scarcity of whatever it is that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of
information sources that might consume it.”

Mindfulness may result in less extensive information search because mindfulness itself entails heightened utilization of the limited cognitive resource of attention. The impact of such reduced scope of information search is unclear though because while there is the possibility of missing key decision-relevant information, there also is less negative affect from onerous information search and less reliance on external criteria for choice.

Mindfulness likely increases the quality of information utilized to make choices because the open-minded awareness and observation that mindfulness entails implies that mindful people will process information in a neutral, unbiased fashion as opposed to filtering information through lenses that are biased by past experiences, cognitive biases, and motivational biases. Mindfulness reduces negativity bias, which is the tendency to weigh negative information more heavily than positive information. Karelaia and Reb hypothesize that mindfulness reduces confirmation seeking and overconfidence by making people less attached to their thoughts, feelings, and self-images. Another way that mindfulness may increase the quality of information utilized in making choices is by letting people discern relevant from irrelevant information. In particular, mindfulness reduces implicit age/race bias.

A final way that mindfulness may increase the quality of information utilized in making choices is by making it more likely that people realize important information is missing and so proactively search for such information.

Mindfulness may help people become more aware of the uncertainties they face by reminding people of the impermanent and temporary nature of their bodily sensations, feelings, and thoughts. Karelaia and Reb hypothesize that mindfulness can help people have an increased tolerance of uncertainty by detaching people from their feelings of unease with uncertainty. Mindfulness can lead people to realize if they engage in excessive information search and redirect their efforts more productively elsewhere. Mindfulness can reduce illusory pattern detection, which is particularly likely when people feel a lack of control.

In the third stage of making conclusions, mindfulness can help people reconcile analysis and intuition by helping people be more aware of when their intuition leads to a choice different from analysis and evaluating if their intuition should be followed. Because a part of mindfulness is emotional self-awareness, the ability to recognize emotions and view them as information helps people make choices that involve making emotionally difficult trade-offs.

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320 Karelaia & Reb, supra note 302, at 172.
322 Karelaia & Reb, supra note 302, at 173-74.
323 Adam Lueke & Bryan Gibson, Mindfulness Meditation Reduces Implicit Age and Race Bias: The Role of Reduced Automaticity of Responding, 6 SOC. PSYCHOL. & PERSONALITY SCI. 284 (2015).
324 Karelaia & Reb, supra note 302, at 174.
325 Id. at 175.
326 Id. at 175.
327 Id. at 175-76; Jennifer A. Whitson & Adam D. Galinsky, Lacking Control Increases Illusory Pattern Perception, 322 SCI. 115 (2008) (presenting data from six experiments).
328 Karelaia & Reb, supra note 302, at 176-77.
329 Id. at 177-78; Mary Frances Luce, Choosing to Avoid: Coping with Negatively Emotion-Laden Consumer
Mindfulness also helps people regulate emotions that arise from conflicts due to making trade-offs. Finally at this stage of the decision-making process, mindfulness can help people implement their choices by translating their intentions into actions by increasing their perceived behavioral control, strengthening their abilities to control their cognition and emotions that are counter to their intentions, reducing the rigidity of their behavior, and heightening their attention and awareness to inner feelings, internal experiences, and situational cues.

In the final stage of learning from feedback, mindfulness can help people recognize when their decision-making environment is not conducive to learning. Karelaia and Reb propose that people who are mindful should be more open to positive and negative feedback and proactively seek feedback because their egos will be less threatened by negative feedback and they should view all facts as being “friendly” information. Karelaia and Reb also believe that people who are mindful should process feedback in an unbiased manner because mindfulness should promote humbleness and reduce cognitive defensiveness, particularly self-serving attribution biases, and overconfidence. Mindfulness practice can thus mitigate many of the difficulties of learning from experience that this Article detailed earlier, if Karelaia and Reb are correct that “mindful decision makers are more likely to learn from feedback and importantly, learn the right lessons.”

A final example of how mindfulness may improve decision-making is provided by a four-step algorithm to decide between two choices, that can be remembered with the acronym DEAL: (1) Define the choices in terms of feelings, images, and words; (2) Explore both sides of each choice in a balanced and complete way; (3) Allow yourself to be open to information from your feelings, images, and words; and 4) Launch yourself into (a) step (1) again to redefine the decision, or (b) realizing the need for additional information, determine how and when to get such information, and getting that information, return to step (1), or (c) stopping the decision process emphasizing equanimity. The website describing this technique notes that about half of the people who were taught this process had self-reported making a decision that they judged to be good within a single practice session and that almost everyone who used this method found that it made decision-making more fun and meaningful. It would be interesting to empirically investigate the efficacy of this procedure.

To sum up part II of this Article, the practice of mindfulness provides real options to adjust one’s decision-making in light of processing information about one’s and possibly others’

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Karelaia & Reb, supra note 302, at 178.

Id. at 178-79; Nikos L. D. Chatzisarantis & Martin S. Hagger, Mindfulness and the Intention-Behavior Relationship within the Theory of Planned Behavior, 33 PERSONALITY & SOC. PSYCHOL. BULL. 633 (2007) (demonstrating this in the context of leisure-time physical activity).

Karelaia & Reb, supra note 302, at 179.

Id. at 180.

Id. at 180-81.

See supra Part I.A.

Karelaia & Reb, supra note 302, at 182.


bodily sensations, feelings, and behavior. Mindfulness can also improve people’s decision-making in a variety of ways during the process of decision-making.

III. THINKING TOOLS

In an interview on a WNPR show, that focused on Nobel economist Robert Shiller and the third edition of his best selling book, Irrational Exuberance, I remarked that as kids we were often told to put on our thinking caps (especially when we were solving mathematics problems) and asked why do we ever take off our thinking caps. One possible answer is provided by evidence from eleven experimental studies finding that college students “typically did not enjoy spending 6 to 15 minutes in a room by themselves with nothing to do but think, that they enjoyed doing mundane external activities much more, and that many preferred to administer electric shocks to themselves instead of being left alone with their thoughts.” In a survey of time use, 83% of American adults reported spending no time whatsoever “relaxing or thinking.” Apparently, some “humans tend to be cognitively lazy and often try to avoid thinking altogether” and “thinking smartly-or even at all-is a challenge.” Another possible answer is that people are now able to put on a literal thinking cap that is a transcranial direct current stimulation device. A third answer is just finiteness of cognition.

Co-founder of the Civility Project at Johns Hopkins, Professor Forni advocates for cultivating the art of thinking because changing how people think can improve their daily lives. Forni quotes Norman Cousins, a political journalist, author, professor, and world peace advocate: “We in America have everything we need except the most important thing of all — time to think and the habit of thought.” Forni laments the lack of instruction about decision-making:

I wish I could tell you that I had the good fortune of undergoing a solid home training in decision making, but I did not. I wish that just one of my teachers had managed to impress upon me and my schoolmates that being happy depends upon making sound choices, that he or she had taught us how to choose well, and

343 BENARTZI & LEWIN, supra note 31, at 6.
344 Id. at 6.
345 See, e.g. Anita Jwa, Early Adopters of the Magical Thinking Cap: A Study on Do-It-Yourself (DIY) Transcranial Direct Current Stimulation (tDCS) User Community, 2 J.L. & BIOSCI. 1, 1 (2015) (analyzing the history and current popularity of tDCS devices as forms of cognitive enhancement).
347 Id. at 4. The quotation is from NORMAN COUSINS, HUMAN OPTIONS: AN AUTOBIOGRAPHICAL NOTEBOOK 28 (1981).
that we had gotten it, really gotten it. What a legacy that would have been!348

The Decision Education Foundation,349 a non-profit organization in Palo Alto, California, works with students, teachers, and schools to provide training in decision skills.350 A number of psychologists and decision theorists have proposed various programs to teach adolescents how to improve their own decision-making skills and expand their understanding of how other people make decisions.351

Gerd Gigerenzer, psychologist and director of the Max Planck Institute for Human Development, and co-authors advocate that societies “increase physician statistical literacy through training in medical school and continuing medical education.”352 In a book chapter titled Teaching Clear Thinking,353 Gigerenzer advocates teaching statistical thinking to teenagers, utilizing “intuitively understandable representations of numbers.”354 Gigerenzer advocates reforming schools and universities to improve people’s numeracy skills and basic statistical literacy: “we need to change school curricula. Our children learn the mathematics of certainty, such as geometry and trigonometry, but not the mathematics of uncertainty, that is, statistical thinking. Statistical literacy should be taught as early as reading and writing are.”355 More recently, in another book chapter titled Revolutionize School,356 Gigerenzer advocates teaching a risk literacy curriculum,357 that includes these three topics: health literacy, financial literacy, and digital literacy, and these three skills for mastering each topic: statistical thinking, rules of thumb, and the psychology of risk.

There is experimental evidence that even a 25-minute training session on statistical reasoning (specifically, the law of large numbers) significantly increased the frequency and quality of people applying statistical reasoning to a wide range of everyday life problems that were outside the context of the training.358 These problems included scenarios that are not usually viewed in terms of probabilities, such as whether a person’s personality can be inferred from first impressions,359 whether the performance of group members can be predicted from the performance of one of its members,360 choosing which of two colleges to attend,361 hiring an

348 FORNI, supra note 346, at 110-11.
349 http://www.decisioneducation.org/.
351 Baron & Brown, supra note 30.
354 Id. at 241. See also Peter Sedlmeier & Gerd Gigerenzer, Teaching Bayesian Reasoning in Less Than Two Hours, 130 J. EXPERIMENTAL PSYCHOL. 380, 384-85 (presenting details of teaching Bayesian reasoning by training people to construct frequency representations instead of inserting probabilities into Bayes’ rule).
357 Id. at 246.
358 Geoffrey T. Fong et al., The Effects of Statistical Training on Thinking About Everyday Problems, 18 COGNITIVE PSYCHOL. 253, 253, 269-70, 280, 282 (1986).
359 Id. at 285-86, 287-88.
360 Id. at 286.
361 Id. at 287.
actress for the lead in a Broadway play, how to determine if you like Chinese food, and how to figure out if you like vacations.

Recent experimental research studies provide evidence that numeric ability is a “robust predictor of superior decision-making across multiple tasks and outcomes.” Actress Danica McKellar has written a series of New York Times bestselling books teaching mathematics in a fun and relevant way to teenage girls. An experimental study of law students found that substantive legal analysis, legal judgment, and legal advice can vary significantly with numeracy, which raises questions concerning the quality and consistency of legal decision-making. Law professor Lisa Milot documents how many lawyers miscalculate, oversimplify, and misapply mathematical principles, explains why lawyer innumeracy matters, differentiates objective innumeracy (due to a lack of mathematical competence) from subjective innumeracy (due to a lack of mathematical confidence), and advocates practical ways that law professors, law students, law schools, and lawyers can overcome legal innumeracy.

The above and other efforts to teach people in general and such particular audiences as teenagers, medical students, and law students in particular about mathematics and numeracy are laudable and should be encouraged. Because of math anxiety and the myth that some people are just not math people, there has been and will be resistance towards efforts at increasing people’s numeracy and statistical literacy. Also, teaching people to be more numerate is not a panacea because of motivated numeracy. The next part of this Article focuses on teaching people about structured ways to think better and more systematically. There should be less resistance towards efforts at increasing people’s thinking architecture because few people should profess to have thinking anxiety or believe that they are just not thinking people. An additional benefit of teaching people about thinking architecture is that doing so is likely to promote metacognition, which is the ability to think about our knowledge acquisition and thinking. Metacognition is a skill that educators hope to transfer to learners and forms an important part of being a self-learner. An example of metacognition is provided by these lyrics from the song

### References

362. *Id.* at 288.
363. *Id.* at 288.
364. *Id.* at 288-89.
372. *Id.* at 788-99.
373. *Id.* at 799-803.
374. *Id.* at 804-08.
375. *Id.* at 808-10.
Love Me Like You Do from the movie Fifty Shades of Grey: “I'll let you set the pace. 'Cause I'm not thinking straight. My head's spinning around I can't see clear no more.”

A. Thinking Architecture

Shlomo Benartzi and John Payne define the phrase “thinking architecture” to be “a structured process that allows us to break down a complex problem, such as what to do in retirement, into a series of manageable thinking steps, so as to improve outcomes.” They explain that what makes thinking architecture different from traditional checklists, is that each of the steps in thinking architecture “is designed to deal with a particular behavioral challenge or mental blind spot … to fortify the weakest parts of the mind.” In a sense, thinking architecture is a low technology version of thinking technology.

An example of thinking architecture is a thinking tool that is due to psychologist Chip Heath and his brother Dan Heath is known as the WRAP decision process, which consists of these heuristics: (1) Widen your options, (2) Reality-test your assumptions, (3) Attain distance before deciding, and (4) Prepare to be wrong. Each heuristic is designed to address and mitigate a particular well-known cognitive bias, namely these: (1) narrow framing of a decision problem; (2) confirmation bias of gathering biased and supportive information; (3) temptation of short-term emotions; and (4) overconfidence about abilities to predict our future.

The Heath brothers provide multiple ways of implementing each of the steps in their WRAP procedure. A way to widen your options is via the Vanishing Options Test, where you ask what else can you do if your current options all vanish. One way to reality-test your assumptions is to specifically consider the opposite of your initial beliefs. A way to attain distance before deciding is by utilizing the 10/10/10 rule, which asks you to consider how you will feel about some decision in 10 minutes, 10 months, and 10 years. Many people found the 10/10/10 heuristic very helpful in diverse situations: “Heartfelt emails and letters soon poured in” from those who applied 10/10/10 “in decisions large and small and in-between, at home and at work,

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376 BENARTZI & LEWIN, supra note 31, at 5. See also BENARTZI & LEHRER, supra note 37, at 197-98.

377 KAHNEMAN, supra note 2, at 226-27 (explaining the virtues of simple algorithms and checklists); ATUL GAWANDE, THE CHECKLIST MANIFESTO: HOW TO GET THINGS RIGHT (2011) (extolling on the virtues of checklists generally).

378 BENARTZI & LEWIN, supra note 31, at 5.

379 CHIP HEATH & DAN HEATH, DECISIVE: HOW TO MAKE BETTER CHOICES IN LIFE AND WORK 23-24 (2013). See also Huang, supra note 36, at 41-51 (detailing this process).

380 HEATH & HEATH, supra note 379, at 31-89.

381 Id. at 91-153.

382 Id. at 155-92.

383 Id. at 193-253.

384 Id. at 18.

385 Id. at 46.

386 Id. at 109, 287-88; Milkman et al., supra note 11, at 381 (discussing how considering the opposite mitigates these cognitive biases: anchoring, hindsight bias, and overconfidence).

387 HEATH & HEATH, supra note 379, at 160; SUZY WELCH, 10-10-10: A FAST AND POWERFUL WAY TO GET UNSTUCK IN LOVE, AT WORK, AND WITH YOUR FAMILY (2009).
and in love, friendship, and parenting.”

Another way to attain distance before deciding is to ask what you would recommend to your best friend. One way to prepare to be wrong is to mentally rehearse what could go wrong and simulate how you would respond. The Heath brothers illustrate all of the above and other ways to apply their WRAP process to many professional and personal situations, thus demonstrating the efficacy, generality, and scope of the WRAP thinking architecture. Law students and lawyers can apply the WRAP heuristics to help improve their ethical and professional decision-making.

Another example of thinking architecture is Shlomo Benartzi’s Goal Planning System (GPS), which consists of this sequence of cognitive strategies: (1) identify your goals, (2) discover blind spots, (3) prioritize your goals, (4) think beyond one future, (5) recognize the limits of forecasting, (6) consider others’ perspectives, and (7) reprioritize goals. Each heuristic is designed to address and mitigate a particular thinking trap, namely: (1) fast thinking and narrow framing, (2) insufficient breadth and depth of cognitive processing, or narrow and shallow thinking, (3) cognitive and emotional difficulties of making trade-offs, (4) overconfidence in abilities to predict the future, (5) difficulties in predicting future emotions, tastes, and preferences, (6) focusing on our uniqueness and overconfidence in abilities to predict our future, and (7) anchoring and status quo bias.

Identifying your goals helps you avoid focusing on the alternatives that you are faced with and instead helps you to focus on your underlying true core values. Discovering blind spots helps you find important goals missing from step (1). Prioritizing your goals helps you make trade-offs by dividing your goals into most important, moderately important, and least important. Thinking beyond one future helps you to avoid narrow thinking in prediction and can be accomplished by the thinking tool of prospective hindsight, which asks you to assume that some future event has already occurred and think of reasons why it happened. Recognizing the limits of forecasting helps you become aware of how much your feelings, tastes, and preferences can change. Considering others’ perspectives helps people to expand their thinking process about their many possible future selves and future preferences. Reprioritizing goals helps people not be anchored to their prioritization of goals in step (3) by starting fresh with a clean slate. Benartzi illustrates how applying the seven decision heuristics in his GPS thinking architecture can improve retirement planning, decisions about buying a home, and choices.

388 Welch, supra note 387, at 19.
390 Id. at 213, 217.
391 Id. at 32-33, 35-36, 257-66.
392 Huang, supra note 36, at 52-59 (detailing how to do so).
393 Benartzi & Lewin, supra note 31, at 7-8.
394 Id. at 11-16.
395 Id. at 21-26.
396 Id. at 31-37.
397 Id. at 49-55.
398 Id. at 61-66.
399 Id. at 69-75.
400 Id. at 79-84.
B. Thinking Technologies

Designing effective ways to teach people about how to improve their decision-making should draw upon educational theories of pedagogy and andragogy, which offers a set of core principles about adult learning. The psychological Unified Learning Model (ULM) is about how people learn and therefore also is about how to teach people. The ULM integrates and synthesizes existing neurobiological and cognitive psychological research and theory about human learning. The ULM is based upon three core principles: (1) learning requires the allocation of working memory or attention, (2) prior knowledge affects the capacity of working memory for allocation, and (3) motivation directs the allocation of working memory.

To learn, people must pay and focus their attention, which is a scarce resource that psychological research finds people do not consciously decide to allocate. Instead certain things are salient and capture the attention of certain people while other things go unnoticed and fade into the background of those people. People also tend to exhibit an “ostrich effect” meaning that they prefer to pay attention to information they like to think about and avoid information they do not like to think about. Financial research utilizing American and Scandinavian data sets found empirical evidence that investors tended to check their portfolio values more frequently after the market rises than when markets are flat or falling (leading to investors putting their heads in the sand). Medical research finds that women who have breast cancer symptoms that are getting worse postpone seeing a doctor longer than those having symptoms that are steady or disappearing. More generally, patient anxiety can result in the avoidance of learning easily available health information through physician visits and other sources. In the above financial and medical contexts, people often prefer to maintain positive illusions regarding their financial situation or health rather than learn information that contradicts their comforting illusions. Finally, researchers have found that people display a learning asymmetry in that people selectively updated “their beliefs more in response to information that was better than expected than to information that was worse.”


BENARTZI & LEWIN, supra note 31, at 21, 25.
Id. at 113-18.
Loewenstein et al., supra note 113, at 391.
Niklas Karlsson et al., The Ostrich Effect: Selective Attention to Information, 38 J. RISK & UNCERTAINTY, 95, 104-10 (2009) (presenting this evidence).
Tali Sharot et al., How Unrealistic Optimism is Maintained in the Face of Reality, 14 NATURE NEUROSCI. 1475 (2011).
they like. Psychologist Michelle Segar emphasizes the importance of motivation and meaning in sustaining a program of physical exercise.\textsuperscript{413} General advances in technology and particular advances in “exercise video games can transform regular physical exercise activity into a more pleasant and meaningful experience.”\textsuperscript{414}

This part of the Article considers various engaging and fun technologies that can help people think better and improve their decision-making. Technology may also help to reduce the frequency and severity of car accidents by reducing or even completely removing the human decision-making element in driving. A number of car manufacturers have introduced technological aids to help people avoid accidents including monitoring sensors that warn of a front-end collision or lane departure and automated systems that are designed to prevent such incidents.\textsuperscript{415} In the near future, self-driving or autonomous cars will reduce if not remove the possibility of driver error.\textsuperscript{416} Technology and human attention can be substitutes and complements. Because human attention is a scarce resource, technology frees up that resource for when human attention is absolutely necessary. The remote possibility of a driver having to resume control in an emergency raises a new problem of drivers not paying enough attention to do so. This problem is similar to one that airplane pilots now face.\textsuperscript{417}

Technological decision support can take the form of thinking architecture apps.\textsuperscript{418} Mobile apps could provide checklists, record and remind people about their own predicted versus actual behavior, and help people have greater awareness of various aspects of choices they face. There is a free iPad app version of Shlomo Benartzi’s GPS thinking architecture applied to retirement planning.\textsuperscript{419} Benartzi and psychologist John Payne also created a Loss Aversion Calculator that measures how much more strongly one experiences losses relative to gains.\textsuperscript{420} Yaron Levi and Shlomo Benartzi found that after people started using a mobile financial app that provides a real time dashboard with a user’s net worth, income, and spending, people’s spending decreased 15.7% on average during the four months after the app was installed.\textsuperscript{421}

A humorous television commercial states that while you are likely to see taxes as being

\begin{footnotesize}
\begin{enumerate}
\item MICHELLE SEGAR, NO SWEAT: HOW THE SIMPLE SCIENCE OF MOTIVATION CAN BRING YOU A LIFETIME OF FITNESS (2015).
\item Huang, supra note 62, at 263, 314.
\item Lane Keeping Assist Helps Keep Drivers Within Lanes, http://www.toyota-global.com/innovation/safety_technology/safety_technology/technology_file/active/lka.html.
\item Bart Jansen, Pilots’ Focus in the Cockpit Under Scrutiny, USA TODAY, Aug. 22, 2013, http://usat.ly/16he33A.
\item BENARTZI & LEHRER, supra note 37, at 199-207 (providing details).
\item \textit{Id.} at 204-7; Retirement Goal Planning System iPad\textsuperscript{®} App, http://bafi.allianzgi.com/en/retirement-goal-planning-system/Pages/Goal-Planning-System-Application.aspx.
\item BENARTZI & LEHRER, supra note 37, at 202-4; BENARTZI & LEWIN, supra note 31, at 123-24; http://www.digita1.org/#lab.
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People’s current lifestyle experiences are easily accessible and tangible in contrast with their future retirement lifestyle experiences, meaning there is a tangibility gap.\textsuperscript{430} Shlomo Benartzi proposed a four-minute future lifestyle imagination exercise to close this tangibility gap.\textsuperscript{431} In the first two minutes, people imagine a financially secure future. In the second two minutes, people write down whatever comes to mind in terms of their tangible lifestyle and their emotional reactions. This imagination exercise takes people who are too present-focused back to the future. Neuroimaging research supports the future self-continuity hypothesis,\textsuperscript{432} that people perceive and treat their future selves differently from their present selves, and therefore may not save for their future.\textsuperscript{433} People’s current selves do not identify with their future selves, meaning there is an identity gap.\textsuperscript{434} People’s current selves also place more weight on their current feelings than the feelings of their future selves, meaning there is an empathy gap.\textsuperscript{435} A

\textsuperscript{422} [https://www.facebook.com/taxbrainfans/videos/10150202831887354/]
\textsuperscript{423} Bay Tiger, \textit{TaxBrain TV Commercial}, \textsc{You Tube} (May 26, 2010), \url{http://www.youtube.com/watch?v=bWMr5NdKqA}.
\textsuperscript{424} [Financial Engines, \url{http://corp.financialengines.com/}. CHristopher L. Jones, \textsc{The Intelligent Portfolio: Practical Wisdom on Personal Investing from Financial Engines} (2008).
\textsuperscript{425} [http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/1990/].
\textsuperscript{426} [ESPlanner, \url{http://www.esplanner.com/}; Laurence J. Kotlikoff & Scott Burns, \textsc{Spend 'Til the End: The Revolutionary Guide to Raising Your Living Standard -- Today and When You Retire} (2008).
\textsuperscript{427} Joseph Bankman, \textsc{Using Technology to Simplify Individual Tax Filing}, 61 \textsc{Nat’l Tax J.} 773 (2008).
\textsuperscript{428} ReadyReturn, \url{https://www.ftb.ca.gov/readyReturn/}.
\textsuperscript{430} Shlomo Benartzi with Roger Lewin, \textsc{Save More Tomorrow: Practical Behavioral Finance Solutions to Improve 401(K) Plans} 140 (2012).
\textsuperscript{431} \textit{Id.} at 140-58.
\textsuperscript{434} Benartzi \& Lewin, supra note 430, at 77.
\textsuperscript{435} \textit{Id.} at 77.
new thinking technology involving age morphing digital technology applied to people’s faces helped people’s current selves identify and empathize with their future selves. Four experimental studies found that people who interacted with realistic age-morphed virtual computer renderings of their future selves were willing to hold out for larger, later monetary rewards instead of accepting smaller, immediate ones.

More generally, virtual reality simulations can improve the accuracy of people’s perceptions of their future selves by helping people learn how their current decisions and behavior shape their future selves. Behavioral economist Colin Camerer suggested that “computer morphing of a body image could be used to show a person, for example, what they would look like in one year if they continue their steady diet of fast food or, oppositely, if they stuck with their personal trainer three times a week for a year.” So, regulators could mandate that fast food restaurants provide a hologram projection of what a customer would look like in the future if they regularly ate healthy versus unhealthy items.

Experimental studies have found evidence of a phenomenon that is known as the Proteus effect, where people infer their expected behaviors and attitudes based upon observing their avatar’s appearance, and conform their online behavior to their digital self-representations independent of how others perceive them. In one study, people assigned to more attractive avatars in immersive virtual environments engaged in more self-disclosure than subjects assigned to less attractive avatars. In another study, those assigned taller avatars behaved more confidently in negotiating than others assigned shorter avatars. The effects found in these studies have been found to extend to an actual online community and subsequent face-to-face interactions.

In the movie WarGames, a United States military supercomputer known as WOPR (War Operation Plan Response), that is also nicknamed Joshua, famously asks a young hacker named David Lightman: “Shall we play a game?” It is well-known that playing video games can have educational benefits. Playing video games can improve children’s problem solving abilities. Neuroscientist Richard Davidson, founder of the Center for Investigating Healthy

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436 Id. at 77, 78-93, 86, Figure 3-1.
442 WARGAMES (United Artists 1983).
443 Dnid, Shall We Play A Game?, YOUTUBE (Sept. 21, 2007), https://www.youtube.com/watch?v=ecPeSmF_ike.
445 Agne Suziedelyte, Media and Human Capital Development: Can Video Game Playing Make You Smarter?
Minds, and Kurt Squire, director of the Games Learning Society Initiative, are designing and testing prototypes of two kinds of games “to help eighth graders develop beneficial social and emotional skills — empathy, cooperation, mental focus, and self-regulation” with the first game focusing on “improving attention and mental focus, likely through breath awareness” and the second game focusing “on social behaviors such as kindness, compassion, and altruism.” In a version of the second game called Crystals of Kaydor, a player is “an advanced robot created to explore and learn, who crash lands on an alien planet” discovering “flora, fauna, and local residents” helping “them solve problems by interpreting body language and nonverbal cues” such as facial expressions and body language. The game “[m]issions reward cooperation and generosity to facilitate the development of prosocial behavior.”

Playing video games can help children learn to think in novel ways. “Epistemology is the study of what it means to know something” or “the study of knowledge.” In this entrepreneurial and technological age of global knowledge-based economies, it is crucial for societies to “develop the tools to help young people learn the epistemologies of creative innovation. One way to do this is through epistemic games: games that are fundamentally about learning to think in innovative ways.” Professor of educational psychology David Shaffer believes that we should move away from thinking about education in terms of the ways traditional schools are organized. His book is organized around chapters that present different epistemic games to illustrate the following concepts. 1) Epistemology: what it means to learn to think; 2) Knowledge: what it means to know something and the kind of knowledge that innovative thinkers in the digital age require; 3) Skills: how computers empower humans to be more productive and enable learning by simulating tasks that professionals do; 4) Values: “how thinking and working like a professional means learning to value things a professional

446 http://www.investigatinghealthyminds.org/.
447 http://www.gameslearningsociety.org/.
449 Id.
450 Id. See also Daphne Bavelier & Richard J. Davidson, Brain Training: Games to Do You Good, 494 NATURE 425, 525-26 (2013); Tobias Greitemeyer et al., Playing Prosocial Video Games Increases Empathy and Decreases Schadenfreude, 10 EMOTION 796, 796 (2010).
451 GLSCenter, Crystals of Kaydor – Gameplay Video, YOUTUBE (Sept. 22, 2014), https://www.youtube.com/watch?v=kKwGZJgJknk
453 Id. at 9.
454 Id. at 10.
455 Id. at 10.
456 Id. at 11.
457 Id. at 12-13.
458 Id. at 12, 73-103.
Intriguingly, playing video games may help improve people’s financial confidence, decision-making, knowledge, self-efficacy, and initiating financial actions. In one video game, Bite Club, a player takes on the role of a vampire who manages a bar for other vampires and saves money for their own retirement. A randomized control trial found that Bite Club players learned as much financial knowledge as those who had been assigned to read an informational pamphlet. Other financial video games include: Celebrity Calamity, where players take on the role of a money manager who tries to keep a Hollywood starlet happy by keeping her out of debt; Farm Blitz, where players take on the role of harvesting crops from a farm while staving off ravenous rabbits which represent debt, and Refund Rush, where players take on the role of a financial advisor who helps clients decide what to do with their tax refunds. Only imagination limits the possible video games that can draw upon popular culture to teach players decision-making principles and financial concepts.

Serious games are games that “have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement.” A literature review of empirical evidence about players aged 14 or above playing computer games and serious games found a diverse range of positive affective, behavioral, cognitive, motivational, and perceptual impacts. A quasi-experimental study of teams of 8th grade students playing serious mobile games found that players had higher perceptions of their own collaboration skills, higher perceptions of their own capacities for executing plans, and better perceptions about science than non-players.

Some professions have begun to explore the use of serious games to teach contextualized decision-making skills. For example, a medical simulation computer video game, JDoc, “immerses the player in the believable world of a busy hospital at night and educates them as to the diagnostic procedures and medical criteria required while working on-call in a hospital.”

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462 Id. at 12-13, 105-34.
463 Id. at 13, 135-66.
464 Id. at 13, 167-93.
ward."

JDoc intends to provide an engaging way for junior doctors to learn communication skills, decision-making skills, diagnostic and medical procedures, interpersonal skills, and medical information. Another virtual environment serious game, DREAD-ED (Disaster Readiness through Education), is a cooperative multi-player game designed to teach communication and group decision-making skills to emergency management personnel. A company called Knack develops app-based video games that provide various measures of a player’s character, decision-making, emotional/social intelligence, leadership, mindset, and thinking. Human resources departments can utilize such information to avoid cognitive biases in their hiring processes. People can utilize such information to increase their self-awareness and choose professions that fit their strengths.

Several research groups have designed serious games that train players to recognize and mitigate cognitive biases in decision-making. A group designed a video adventure game called Missing: The Pursuit of Terry Hughes, that has a noir feel and combines the rich, immersive qualities of entertainment software with a host of training activities on cognitive bias recognition and mitigation incorporated into game play. One study found that playing Missing effectively trained adults to identify and mitigate these three cognitive biases: confirmation bias (“the tendency to seek out or focus on information that confirms a hypothesis while overlooking or discounting evidence that might disconfirm that hypothesis”), fundamental attribution error (“assuming that another person’s behavior must stem from personal characteristics while overlooking the potential impact of situational influences”), and bias blind spot (“the tendency to recognize bias in others but not in oneself”). Missing consists of “three episodes, during which the player completes a series of tasks and interactions with game characters, all in the pursuit of resolving the mystery at the center of the story.” Players “can examine different objects, meet and question non-player characters, use a smartphone to take pictures and communicate, and navigate in the scenario.”

A player is

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472 Id. at 132.


478 Symborski et al. *supra* note 477, at 3.

479 Id. at 2.

480 Id. at 2.

481 Id. at 2.

482 Id. at 3.

483 Id. at 3.
“exposed to specific bias-provoking situations in the form of ‘bias vignettes,’ where cognitive biases exhibited by the player are measured. After each episode is played, there is an After Action Review that teaches about specific biases, offers feedback on game performance, and reinforces the point with a story.”

This game “allows players to generalize their learning across different problems and portions of the game to other biases.” This game moves a player through these four instructive phases: 1) eliciting a target cognitive bias in a naturalistic scenario, 2) examining a player’s actions or asking a player questions to determine if a cognitive bias happened, 3) providing feedback to a player about whether a player avoided or exhibited a cognitive bias, and 4) reinforcing a player’s understanding of a cognitive bias by providing other examples that highlight similar cognitive bias aspects and contexts. This game incorporates an engaging storyline about Terry, “a gregarious, well-liked figure with an extravagant social life” who goes missing. Terry’s brother Chris becomes worried when she disappears and asks her neighbor, the player of the game, to look around Terry’s apartment for clues about why Terry is missing.

An independent validation and verification team unaffiliated with the authors of the article conducted an external test campaign on two groups: college students and intelligence analysts. It should be unsurprising that learning to recognize and mitigate cognitive biases are crucial skills for intelligence analysts being effective. Players of this game achieved statistically significant immediate increases in their knowledge about cognitive biases, by 37% for students and 44% for analysts. The immediate bias mitigation effects were improvements of 25% for students and 27% for analysts. Of the players who completed follow-up testing after eight weeks, cognitive bias knowledge retention decreased from 37% to 25% among students and from 39% to 26% among analysts, while bias mitigation decreased from 29% to 28% among students and from 27% to 20% among analysts. This game was significantly more effective at teaching students and analysts to recognize mitigate cognitive biases when compared to control groups that watched an educational video about cognitive biases. Of the players who completed follow-up testing after eight weeks, this effect continued for students and not for analysts.

Another version of the game, Missing: The Final Secret was designed to teach players to recognize and mitigate three different cognitive biases: anchoring bias (“overweighting the first
information primed or considered in subsequent judgment (497), social projection bias ("assuming others’ emotions, thoughts, and values are similar to one’s own") (498), and representativeness bias ("using the similarity of an outcome to a prototypical outcome to judge its probability") (499). This version followed a similar genre, narrative arc, and structure as Missing: The Pursuit of Terry Hughes. Players of this version “exonerate their employer of a criminal charge and uncover the criminal activity of her accusers.” (500) Playing this version of Missing produced immediate medium to large debiasing effects that persisted at least 2 months later and greater effects than watching instructional videos immediately and 2 months later. These “effects were domain-general: bias reduction occurred across problems in different contexts, and problem formats that were taught and not taught in the interventions.” (501)

Another group of researchers designed Hueristica, (502) a 3D immersive serious game in which players compete to be the commander of a space station where there is tension between androids and humans, also to teach players to recognize and mitigate cognitive biases. (503) Researchers found that Hueristica players improved their abilities to learn and mitigate confirmation bias, fundamental attribution error, and bias blind spot. (504) Researchers also found that Hueristica players improved their abilities to learn and mitigate these additional three cognitive biases: anchoring effect, representativeness bias, and social projection bias. (505) Hueristica, which is based on Gigerenzer and Todd’s work on simple heuristics, focuses on training players to recognize situational cues, such as ambiguous information and limited information, rather than warning players about each bias. Because Hueristica occurs in an outer space setting, its training should apply to general audiences. A third group of researchers designed a single-player, 30-minute puzzle serious game, CYCLES Training Center, (506) also to teach players to recognize and mitigate cognitive biases. (507) It would be interesting to analyze whether any of these above serious games or modifications of them would also be effective for other populations, such as teenagers, medical students, law students, lawyers, and judges.

To sum up part III of this Article, people can improve their decision-making by utilizing such thinking architecture as Chip Heath and Dan Heath’s WRAP procedure and Shlomo

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497 Id. at 11.
498 Id. at 11-12.
499 Id. at 11.
500 Id. at 20.
501 Id. at 2.
504 Elizabeth S. Veinott at al., The Effect of Camera Perspective and Session Duration on Training Decision Making in a Serious Video Game, GAMES INNOVATION CONF. 2013 IEEE 256, 256-62 (2013).
Benartzi’s GPS process. People can also improve their decision-making by employing various thinking technologies, including thinking apps, financial entertainment games, and serious games.

**CONCLUSIONS**

This Article advocates three categories of policy responses to people having difficulties with making decisions. First, societies can and should facilitate the practice of mindfulness to provide people with real options to exercise their autonomy and improve their decision-making. Second, societies can and should facilitate people employing thinking architecture to improve their decision-making. Third, societies can and should facilitate people utilizing thinking technologies to improve their decision-making. Societies can and should facilitate people practicing mindfulness, employing thinking architecture, and utilizing thinking technologies by educating people about and providing people with opportunities to directly experience first-hand mindfulness and thinking tools. Offering people opportunities to warm up to or warm onto mindfulness and thinking tools are likely to convince many people of the benefits and efficacy of mindfulness and thinking tools in empowering people to choose wisely in many situations across many domains.

All three proposals exemplify promulgating learning architectures\(^\text{508}\) that allow people to better learn how to think and make decisions. All three proposals do not have societies force or make adults do anything. All three proposals can All three proposals also differ from choice architecture and nudges in explicitly focusing on and analyzing how to effectively improve people’s decision-making processes. Instead of assuming or believing that people’s decision-making abilities are fixed or too expensive to improve, this Article adopts and advocates that societies and people adopt growth mindsets about people’s decision-making skills.

The rationales for government interventions to empower people to choose wisely by improving their decision-making processes are many. First are standard rationales based on good decision-making skills being public goods that have positive externalities and bad decision-making skills being public bads that have negative externalities. Second, private actors may not have enough incentive to improve people’s decision-making skills either because private actors can profit more from people making bad decisions than teaching people to make good decisions or private actors can not capture all of the spillover benefits to people making better decisions across many disparate domains. Third, even if private actors can profit from improving people’s decision-making processes, there remain issues of access, equity, and fairness about whether empowering people to make better decisions should be left to just market forces. Fourth, public and private education about mindfulness, thinking architecture, and thinking technologies can co-exist as they do with many other subjects. Fifth, because people can form and maintain good habits about practicing mindfulness, employing thinking architecture, and utilizing thinking technologies, government should educate children as early as possible about mindfulness, thinking architecture, and thinking technologies.

This Article advocates that government should fund additional basic and applied research

\(^{508}\) The phrase learning architecture pays homage and tribute to the phrase choice architecture from THALER & SUNSTEIN, supra note 3. The difference in the two phrases is due to a difference in emphasis on the process of learning versus the act of choice.
about how, when, why, and under what conditions various forms of mindfulness, particular instances of thinking architecture and specific versions of thinking technologies can improve people’s decision-making. There is already widespread interest about the practice of mindfulness among businesses and the public. What is novel in this Article is the perspective that mindfulness provides real options to exercise autonomy and improve people’s decision-making processes.

Mindfulness is not expensive to practice and so can be accessible to many people. Concerns exist over how large the benefits to mindfulness are, whether there are drawbacks or downsides to mindfulness practice for some, and if a secularized version of mindfulness lacks a crucial ethical component. Thinking architecture is also inexpensive to employ and so can also be accessible to many people. Decision researchers can empirically investigate whether different populations who learn about thinking architectures, such as the Heath brothers’ WRAP process or Shlomo Benartzi’s GPS procedure, improve decision-making in sustainable ways across different situations. Thinking technologies vary from inexpensive mobile apps to expensive virtual reality simulators. Government can subsidize the development, dissemination, and consumer adoption of serious games designed to teach the public to recognize and mitigate cognitive biases.

Ideally, societies will one day teach all kids in primary schools about mindfulness, thinking architecture, and thinking technologies. Societies should continue teaching students in secondary schools more in depth about mindfulness, thinking architecture, and thinking technologies. Until that day and possibly even after then, colleges, business schools, law school, medical schools, other professional schools, executive master’s programs, and continuing professional education programs can teach their students about how to apply mindfulness, thinking architecture, and thinking technologies in particular areas of specialization and professional decision-making domains.509