

# Boost: Improving Mindfulness, Thinking, and Diversity

Peter H. Huang

---

## Repository Citation

Peter H. Huang, *Boost: Improving Mindfulness, Thinking, and Diversity*, 10 Wm. & Mary Bus. L. Rev. 139 (2018), <https://scholarship.law.wm.edu/wmblr/vol10/iss1/4>

# BOOST: IMPROVING MINDFULNESS, THINKING, AND DIVERSITY

PETER H. HUANG\*

## ABSTRACT

*Many important decisions can be difficult; require focused, cognitive attention; produce delayed, noisy feedback; benefit from careful and clear thinking; and quite often trigger anxiety, stress, and other strong, negative emotions. Much empirical, experimental, and field research finds that we often make decisions leading to outcomes we judge as suboptimal. These studies have contributed to the popularity of the idea of nudging people to achieve better outcomes by changing how choices and information are framed and presented (also known as choice architecture and information architecture). Although choice architecture and information architecture can nudge people into better outcomes, choice architecture and information architecture also assume implicitly or explicitly that people's decision-making competencies are immutable or too costly to improve and, therefore, choice architecture and information architecture fail to improve people's decision-making competencies.*

*This Article advocates boosts to improve mindfulness, thinking, and diversity. Boosts differ from nudges in that boosts aim to improve decision-making competencies, instead of just decision-making outcomes. Mindfulness involves paying attention to life in an intentional way as it unfolds moment to moment. Mindfulness improves decision-making through many pathways, including by reducing stress and negative emotions. Recent economic research demonstrates that many cognitive biases exemplify lack*

---

\*Professor and DeMuth Chair of Business Law, University of Colorado Law School. JD, Stanford Law School; PhD, Harvard University; AB, Princeton University. Thanks for helpful comments, discussions, and suggestions to Lauren Willis and audiences from the Western Economic Association International conference, Ethics Scholar in Residence presentation of the Academy of Legal Studies in Business conference, the University of Colorado Department of Psychology and Neuroscience Social Psychology Brown Bag, the Southern Economic Association conference, and the University of Colorado Law School.

*of mindfulness about particular aspects of life. Thinking boosts include thinking technologies and diversity. Thinking technologies involve computer or digital technologies to assist people in their thinking. Examples of novel, fun thinking technologies include a financial entertainment computer video game 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. Diversity creates bonuses for organizations by improving decision-making, creativity, innovation, prediction, problem-solving, and productivity.*

TABLE OF CONTENTS

INTRODUCTION ..... 142

I. HOW TO IMPROVE DECISION-MAKING ..... 148

*A. Problems with Improving Decision-Making from Experience* ..... 149

*B. Nudging or Steering People’s Decision Outcomes*..... 153

*C. Boosting People’s Decision-Making Competencies*..... 157

*D. Soft Paternalism versus Positive Parentonomics* ..... 167

*E. Intellectual Virtues* ..... 170

II. MINDFULNESS ..... 172

*A. Cognitive Biases as Forms of Mindlessness*..... 173

*B. How Mindfulness Can Improve Decision-Making*..... 176

III. THINKING BOOSTS..... 182

*A. Thinking Technologies*..... 183

*B. Diversity* ..... 190

CONCLUSION ..... 194

## INTRODUCTION

In a notable scene from the well-known movie *Indiana Jones and the Last Crusade*,<sup>1</sup> a Nazi soldier chooses poorly resulting in his death, while Indiana Jones chooses wisely by practicing mindfulness and careful thinking resulting in saving Indiana Jones' father's life. Mindlessness and careless thinking often cause people to choose poorly in life and fiction, resulting in tragedy.<sup>2</sup> All of us often face choices that are complex, stressful, and require careful thinking.<sup>3</sup>

Examples of such choices include choices about health, healthcare, love, spending, investing, and retirement savings and planning.<sup>4</sup> Many empirical, experimental, and field studies in behavioral economics find that choice contexts often unconsciously influence people's choices.<sup>5</sup> This research underlies the currently popular idea of nudging people's choices,<sup>6</sup> through choice architecture, which designs choice contexts to influence people's choices, and information architecture, which designs information presentation to influence people's choices.<sup>7</sup> Behavioral economics also finds that people often choose poorly due to unconscious cognitive biases.<sup>8</sup> Nudges incorporate or take advantage of people's cognitive biases to nudge people's choices to different outcomes.<sup>9</sup> The 2017 award of the Sveriges Riksbank Prize in economic sciences

---

<sup>1</sup> YouTube Duck Channel 120, *Indiana Jones 3 Holy Grail Scene*, YOUTUBE (May 20, 2016), <https://www.youtube.com/watch?v=A0TalLrtZ24> [<http://perma.cc/J33W-FSVC>] (displaying video-clip from *INDIANA JONES AND THE LAST CRUSADE* (Paramount Pictures 1989)).

<sup>2</sup> See Creagan Dow, *Horror Movie: It's What You Do—GEICO Commercial*, YOUTUBE (Jan. 30, 2015), <https://www.youtube.com/watch?v=uQ-hlcux66s> [<http://perma.cc/4G96-SUXV>] (depicting horror movie characters choosing poorly).

<sup>3</sup> See RICHARD H. THALER & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* 74 (1st ed. 2008).

<sup>4</sup> See, e.g., THALER & SUNSTEIN, *supra* note 3.

<sup>5</sup> See DANIEL KAHNEMAN, *THINKING, FAST AND SLOW* 109–265 (1st ed. 2011) (surveying this research).

<sup>6</sup> THALER & SUNSTEIN, *supra* note 3, at 4 (introducing nudges); Pierre Schlag, *Nudge, Choice Architecture, and Libertarian Paternalism*, 108 MICH. L. REV. 913, 913 (2010) (reviewing and critiquing the book *NUDGE*).

<sup>7</sup> THALER & SUNSTEIN, *supra* note 3, at 3; Schlag, *supra* note 6, at 916.

<sup>8</sup> See THALER & SUNSTEIN, *supra* note 3, at 30.

<sup>9</sup> *Id.* at 26.

in memory of Alfred Nobel to behavioral economist Richard Thaler has focused more public attention on, and popular press coverage of, nudges.<sup>10</sup>

This Article analyzes and advocates *boosts* that aim to enhance people's decision-making competencies,<sup>11</sup> such as risk or statistical literacy education,<sup>12</sup> identifying and teaching people a limited core of domain-specific factual and procedural knowledge,<sup>13</sup> and designing and disseminating simple cognitive heuristic strategies that support better decision-making.<sup>14</sup> This Article advocates policies to foster people adopting growth mindsets,<sup>15</sup> as opposed to fixed mindsets, about their decision-making skills to create a learning society<sup>16</sup> and a learning economy,<sup>17</sup> which are both inherently linked to democracy.<sup>18</sup> Being optimistic about one's ability to change and learn facilitates learning.<sup>19</sup> Conversely, being pessimistic about one's ability to change and learn impedes learning.<sup>20</sup>

<sup>10</sup> Richard H. Thaler, Award Recipient, Prize Lecture: From Cashews to Nudges: The Evolution of Behavioral Economics at Stockholm University (Dec. 8, 2017), [https://www.nobelprize.org/nobel\\_prizes/economic-sciences/laureates/2017/thaler-lecture.html](https://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2017/thaler-lecture.html) [<http://perma.cc/AN5D-K2ZW>].

<sup>11</sup> Till Grüne-Yanoff & Ralph Hertwig, *Nudge Versus Boost: How Coherent are Policy and Theory?* 26 MINDS & MACHINES 149, 156 (2016) [hereinafter Grüne-Yanoff & Hertwig, *Nudge Versus Boost*]; Ralph Hertwig, *When to Consider Boosting: Some Rules for Policy-Makers*, 1 BEHAV. PUB. POL'Y 143, 144, 146 (2017); Ralph Hertwig & Till Grüne-Yanoff, *Nudging and Boosting: Steering or Empowering Good Decisions*, 12 PERSP. PSYCHOL. SCI. 973, 974 (2017) [hereinafter Hertwig & Grüne-Yanoff, *Nudging and Boosting*].

<sup>12</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 158–59, 166; Hertwig & Grüne-Yanoff, *Nudging and Boosting*, *supra* note 11, at 977, 979.

<sup>13</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 159–60.

<sup>14</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 162; Hertwig & Grüne-Yanoff, *Nudging and Boosting*, *supra* note 11, at 979.

<sup>15</sup> CAROL DWECK, MINDSET: THE NEW PSYCHOLOGY OF SUCCESS ix (1st ed. 2007).

<sup>16</sup> See generally JOSEPH E. STIGLITZ & BRUCE C. GREENWALD, CREATING A LEARNING SOCIETY: A NEW APPROACH TO GROWTH, DEVELOPMENT, AND SOCIAL PROGRESS 457–72 (2014) (explaining that learning is a way to change mindsets which leads to a society's growth and development).

<sup>17</sup> See generally *id.* at 47–87 (exploring how to create an economy that supports learning).

<sup>18</sup> *Id.* at 466.

<sup>19</sup> RICHARD E. NISBETT, INTELLIGENCE AND HOW TO GET IT: WHY SCHOOLS AND CULTURES COUNT 143 (2d ed. 2010).

<sup>20</sup> Miles Kimball, *There's one key difference between kids who excel at math and those who don't*, QUARTZ (Oct. 27, 2013), <http://qz.com/139453/theres-one>

One reason that people choose poorly is a lack of thinking carefully and clearly, which in turn makes people vulnerable to impulsiveness, short-sightedness, neglect of probabilities, and many other cognitive biases.<sup>21</sup> This Article advocates a human developmental approach to law and economics that draws upon biological, cognitive, neurological, psychological, and social theories of human development.<sup>22</sup> Humans can develop abilities, competencies, and virtues<sup>23</sup> to realize their full potentials.<sup>24</sup>

There are many reasons why American society should boost people's decision-making competencies.<sup>25</sup> First, an effective and well-functioning democracy requires educating individuals about how to make good civic and governance decisions.<sup>26</sup> Second, educating people to make better economic and political decisions reduces economic inequalities and political inequities.<sup>27</sup> Third, when 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.<sup>28</sup> Such negative externalities provide a well-known justification for government intervention.<sup>29</sup> Fourth, effective decision-making skills are public goods with positive externalities (such as better citizenship, voting, marriages, parenting, physical health, mental health,

---

-key-difference-between-kids-who-excel-at-math-and-those-who-dont/ [http://perma.cc/B7Q7-SUXD].

<sup>21</sup> Jonathan Baron & Rex V. Brown, *Why Americans Can't Think Straight*, in *TEACHING DECISION-MAKING TO ADOLESCENTS* 1, 2–3 (Jonathan Baron & Rex V. Brown eds., 1st ed. 1991).

<sup>22</sup> John F. Tomer, *Smart Persons and Human Development: The Missing Ingredient in Behavioral Economics*, in *HANDBOOK OF BEHAVIOURAL ECONOMICS AND SMART DECISION-MAKING: RATIONAL DECISION-MAKING WITHIN THE BOUNDS OF REASON* 137, 138 (Morris Altman ed., 1st ed. 2017).

<sup>23</sup> *Id.* at 149–51.

<sup>24</sup> *Id.* at 152.

<sup>25</sup> See THALER & SUNSTEIN, *supra* note 3.

<sup>26</sup> See Martha Minow, *Education and Democracy*, HARV. L. REV. BLOG (Oct. 17, 2017), <https://blog.harvardlawreview.org/education-and-democracy/> [http://perma.cc/NN8K-AQCF].

<sup>27</sup> *See id.*

<sup>28</sup> See Colin Camerer et al., *Regulation for Conservatives: Behavioral Economics and the Case for "Asymmetric Paternalism"*, 151 U. PA. L. REV. 1211, 1212 (2003).

<sup>29</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 149.

and well-being) and correspondingly ineffective decision-making skills are public bads with negative externalities (for example, when governments have to use tax dollars to deal with the individual and societal consequences of ineffective individual decision-making).<sup>30</sup> Fifth, the private sector may not have enough incentive to improve people's decision-making skills because often businesses can profit more from exploiting people's cognitive biases<sup>31</sup> than mitigating them, and/or businesses cannot capture all of the benefits from improving people's decision-making competencies because some of those benefits are uncertain, delayed, and spillover into many other wide-ranging domains.<sup>32</sup> Sixth, even if businesses can profit from improving people's decision-making competencies, there are issues of access, affordability, equity, and fairness about whether empowering people to make better decisions should be left to just (not necessarily competitive) market forces.<sup>33</sup> Seventh, public and private boosts can coexist as they do with many other subjects.<sup>34</sup> Eighth, because people will form decision-making habits and maintain decision-making routines, boosts can and should begin as early as possible with children.<sup>35</sup>

The difference between a nudge and a boost is concretely illustrated in the context of eating.<sup>36</sup> In his 2017 economics Nobel Prize lecture,<sup>37</sup> Thaler tells the well-known story about how everybody thanked him when he was a graduate student at a party when he took a bowl of cashews into the kitchen after about half the nuts had been eaten.<sup>38</sup> His moving the nuts is an example of

---

<sup>30</sup> See JESSICA LAHEY, *THE GIFT OF FAILURE: HOW THE BEST PARENTS LEARN TO LET GO SO THEIR CHILDREN CAN SUCCEED* xxvii (1st ed. 2015); THALER & SUNSTEIN, *supra* note 3, at 74; Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 149, 175; Minow, *supra* note 26.

<sup>31</sup> GEORGE AKERLOF & ROBERT SHILLER, *PHISHING FOR PHOOLS: THE ECONOMICS OF MANIPULATION AND DECEPTION* 1–2 (1st ed. 2015).

<sup>32</sup> See generally *id.* (explaining how competition leads to the benefits of consumer decisions being spread out throughout the free market).

<sup>33</sup> See generally *id.* (explaining how the free market can both help and hurt consumers, but how consumer impact will reach equilibrium naturally through the market).

<sup>34</sup> THALER & SUNSTEIN, *supra* note 3, at 71.

<sup>35</sup> See Hertwig & Grüne-Yanoff, *Nudging and Boosting*, *supra* note 11, at 978–79.

<sup>36</sup> Thaler, *supra* note 10.

<sup>37</sup> *Id.*

<sup>38</sup> *Id.*

a nudge because it changed people's choice environment in a way that was easy for people to reverse.<sup>39</sup>

Those nuts were now in the kitchen.<sup>40</sup> People could still eat them if they just went to the kitchen.<sup>41</sup> The reason Thaler moved them is because he correctly believed most people would not walk to the kitchen to eat the nuts.<sup>42</sup> When the nuts were in front of people, many people ate those nuts mindlessly.<sup>43</sup>

A boost alternative to mindless eating is to teach people to manage their lifestyle differently, make changes in food choices, increase aerobic activity, and reduce stress through mindfulness meditation, yoga, guided imagery, breathing, and relaxation exercises.<sup>44</sup> This boost changes people's decision-making competencies.<sup>45</sup> It also has benefits that spill over into other domains besides eating.<sup>46</sup> This boost can help people to focus on what is important, develop self-belief, self-efficacy, self-confidence, and self-compassion.<sup>47</sup> The nudge of removing tempting food is a short-term intervention that changes people's decision-making environment.<sup>48</sup> The mindful eating boost is a long-term intervention that changes people's decision-making competencies.<sup>49</sup> The mindful eating boost has higher costs (in terms of effort, time, and money) and higher benefits (in terms of spillovers, self-confidence, and self-efficacy) than the moving tempting food nudge.<sup>50</sup> The costs and benefits of boosts and nudges can vary across people

<sup>39</sup> *Id.*

<sup>40</sup> *Id.*

<sup>41</sup> *Id.*

<sup>42</sup> *Id.*

<sup>43</sup> *Id.*

<sup>44</sup> *Learn to be Lean Program*, MASS. GEN. HOSP. CORRIGAN MINEHAN HEART CTR., [http://www.massgeneral.org/heartcenter/cardiac\\_metabolicsyndrome\\_program.aspx?display=learn-to-be-lean](http://www.massgeneral.org/heartcenter/cardiac_metabolicsyndrome_program.aspx?display=learn-to-be-lean) [<http://perma.cc/6T44-2NU9>].

<sup>45</sup> *See id.*

<sup>46</sup> Terry Byrne, *Prevention Priority: Emphasis on Wellness Grows*, MASS. GEN. HOSP. MAG., <https://giving.massgeneral.org/disease-prevention-as-priority/> [<http://perma.cc/8T9D-VJ35>].

<sup>47</sup> *Id.* (reporting that participants learn to eat mindfully, focus on "making healthy lifestyle choices" and "shift their mindset toward healthy behavior over the long term. It's ... an approach to healthy eating.").

<sup>48</sup> *See* Thaler, *supra* note 10.

<sup>49</sup> Hertwig, *supra* note 11, at 155.

<sup>50</sup> *See id.* at 157; Byrne, *supra* note 46.

and time. Nudges and boosts are not mutually exclusive.<sup>51</sup> Nudges and boosts can be complements or substitutes.<sup>52</sup> Boosts respect and foster people's abilities to develop and learn decision-making competencies.<sup>53</sup> Nudges assume that people's abilities to develop and learn decision-making competencies are lacking or not worth engaging.<sup>54</sup>

This Article advocates that societies can and should promulgate boosts. This Article focuses on these boosts: (1) practicing mindfulness and (2) thinking boosts, including thinking technologies and diversity. There are three audiences to which this Article is addressed. First, this Article offers a guide to law students, law professors, lawyers, judges, regulators, and indeed anyone interested in how to improve their decision-making competencies in order to make better decisions. Second, this Article is directed at federal and state policymakers to engage with and complement an existing literature about nudging. Third, this Article is aimed at policymakers and the public in advocating that societies empower people through boosts that improve decision-making competencies.

The rest of this Article is organized as follows. Part I analyzes how to improve decision-making. Part II analyzes how mindfulness can improve people's processes of making decisions in any situation by more consciously, deliberatively, and thoughtfully responding instead of automatically, reflexively, and unconsciously reacting. Part II extends a recent novel application of real-options theory<sup>55</sup> analyzing how improving mindfulness fosters legal ethics and professionalism.<sup>56</sup> Part II also analyzes other ways in which mindfulness can improve people's decision-making. Part III analyzes two kinds of thinking boosts: thinking technologies that build on behavioral research about how people think and

---

<sup>51</sup> See Hertwig & Grüne-Yanoff, *Nudging and Boosting*, *supra* note 11, at 979.

<sup>52</sup> *Id.*

<sup>53</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 156.

<sup>54</sup> *Id.* at 153.

<sup>55</sup> Peter H. Huang, *A New Options Theory for Risk Multipliers of Attorney's Fees in Federal Civil Rights Litigation*, 73 N.Y.U. L. REV. 1943, 1946–47 (1998) (discussing examples of real options).

<sup>56</sup> Peter H. Huang, *How Improving Decision-Making and Mindfulness Can Improve Legal Ethics and Professionalism*, 21 J.L. BUS. & ETHICS 35, 68–71 (2015).

behave on digital screens,<sup>57</sup> and diversity that builds on complex systems research about how groups make decisions.<sup>58</sup>

### I. HOW TO IMPROVE DECISION-MAKING

The quality of people's choices can be assessed according to multiple criteria.<sup>59</sup> Two established criteria are<sup>60</sup>: (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.<sup>61</sup> A final possible criterion asks if people's choices are socially desirable.<sup>62</sup> This Article focuses on the personal goal attainment and social desirability criteria of assessing people's choices.

Utilizing the criteria of subjective goal attainment and social desirability, choosing poorly is costly.<sup>63</sup> Increases in information (and noise), time pressure constraints, simultaneous decision-making, globalization, and information-based economies all imply that choosing poorly 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."<sup>64</sup> In

---

<sup>57</sup> See, e.g., SHLOMO BENARTZI WITH JONAH LEHRER, *THE SMARTER SCREEN: SURPRISING WAYS TO INFLUENCE AND IMPROVE ONLINE BEHAVIOR* (1st ed. 2015).

<sup>58</sup> See, e.g., SCOTT E. PAGE, *THE DIFFERENCE: HOW THE POWER OF DIVERSITY CREATES BETTER GROUPS, FIRMS, SCHOOLS, AND SOCIETIES* 24–25, 50 (rev. ed. 2008).

<sup>59</sup> See Philip T. Dunwoody, *Theories of Truth as Assessment Criteria in Judgment and Decision-making*, 4 *JUDGMENT & DECISION-MAKING* 116, 123 (2009); Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 162. See generally KENNETH R. HAMMOND, *HUMAN JUDGMENT AND SOCIAL POLICY: IRREDUCIBLE UNCERTAINTY, INEVITABLE ERROR, UNAVOIDABLE INJUSTICE* 95–106 (2000) (defining and providing examples of the criteria of coherence and correspondence).

<sup>60</sup> See HAMMOND, *supra* note 59, at 95–106 (defining and providing examples of the criteria of coherence and correspondence).

<sup>61</sup> Dunwoody, *supra* note 59, at 123.

<sup>62</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 162.

<sup>63</sup> See Dunwoody, *supra* note 59, at 123; Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 162.

<sup>64</sup> Katherine L. Milkman et al., *How Can Decision-making Be Improved?*, 4 *PERSP. PSYCHOL. SCI.* 379, 379 (2009).

addition to monetary costs of choosing poorly, there are psychological and emotional costs to choosing poorly.<sup>65</sup>

Given that people often consider themselves as choosing suboptimally, societies face a fundamental question: how can and should societies respond to people's choosing suboptimally? The answer 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.<sup>66</sup> Making decisions can be difficult and stressful, even with help from others.<sup>67</sup> There is a decision-making information marketplace consisting of advice, books, courses, online services, planning, and software among other products.<sup>68</sup> Law can and should help decision makers who are not experts, which is all of us in some area(s) or domain(s).<sup>69</sup> The question is how to do this. This Article analyzes three policies. The first is a laissez-faire policy of doing nothing based on a belief that people can learn from their experience to improve decision-making.<sup>70</sup> The second is the by now well-known intervention of nudges designed to improve the outcomes of people's decision-making by changing their decision-making environments.<sup>71</sup> The third is the more recent innovation of boosts that aim to improve people's decision-making competencies.<sup>72</sup>

#### *A. Problems with Improving Decision-Making from Experience*

A possible response to people making suboptimal choices is for governments to do nothing based upon a belief that over time and with repeated experience people will improve their decision-making.<sup>73</sup> One problem with this reaction is that many decisions (such as marriage and retirement) are infrequent, entail large

---

<sup>65</sup> See THALER & SUNSTEIN, *supra* note 3, at 33–34.

<sup>66</sup> Richard A. Epstein, *Behavioral Economics: Human Errors and Market Corrections*, 73 J. U. CHI. L. REV. 111, 111 (2006).

<sup>67</sup> See *id.*

<sup>68</sup> See THALER & SUNSTEIN, *supra* note 3, at 255–62 (giving examples of a variety of sources to further understand decision-making).

<sup>69</sup> See *id.* at 3.

<sup>70</sup> *Id.* at 83.

<sup>71</sup> Hertwig & Grüne-Yanoff, *Nudging and Boosting*, *supra* note 11, at 973.

<sup>72</sup> *Id.* at 974.

<sup>73</sup> THALER & SUNSTEIN, *supra* note 3, at 6.

personal and social costs if incorrectly decided, and provide delayed, limited, and noisy feedback.<sup>74</sup> An analogous philosophy in the realm of parenting, called autonomy-supportive parenting,<sup>75</sup> advocates parents let their kids fail so their kids can learn from such experiences.<sup>76</sup>

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.<sup>77</sup> 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 interventions and that are important to the individual’s development of effective decision-making skills and strategies.”<sup>78</sup> They are concerned that paternalistic policies may restrict learning opportunities and introduce noise into, or mute feedback signals in, learning environments.<sup>79</sup> They are also concerned that paternalistic policies can become self-fulfilling for both laypeople and regulators, leading to further demand for additional future paternalism.<sup>80</sup> They base their analysis upon developmental psychological research indicating “that individuals improve their decision-making skills over time through a ‘learning by doing’ process”<sup>81</sup> and psychologist James Byrnes’ self-regulation model of decision-making.<sup>82</sup> Klick and Mitchell are justified to be concerned that paternalistic interventions and

---

<sup>74</sup> *Id.* at 73–76.

<sup>75</sup> LAHEY, *supra* note 30, at xxi–xxii; Greg Toppo with Jessica Lahey, *New Book Suggests Parents Learn to Let Kids Fail*, USA TODAY (Aug. 12, 2015), <http://usat.ly/1Tsg9wn> [<http://perma.cc/9N89-FE8U>].

<sup>76</sup> See MARK D. WHITE, *THE MANIPULATION OF CHOICE: ETHICS AND LIBERTARIAN PATERNALISM* 119–23 (2013).

<sup>77</sup> See *id.* at 119.

<sup>78</sup> Jonathan Klick & Gregory Mitchell, *Government Regulation of Irrationality: Moral and Cognitive Hazards*, 90 MINN. L. REV. 1620, 1626 (2006).

<sup>79</sup> See *id.* at 1633.

<sup>80</sup> See *id.* at 1638–41; WHITE, *supra* note 76, at 122.

<sup>81</sup> Klick & Mitchell, *supra* note 78, at 1626.

<sup>82</sup> See JAMES P. BYRNES, *THE NATURE AND DEVELOPMENT OF DECISION-MAKING: A SELF-REGULATION MODEL* 109–10 (1998); James P. Byrnes et al., *Learning to Make Good Decisions: A Self-Regulation Perspective*, 70 CHILD DEV. 1121, 1124 (1999).

nudges may hinder people from having opportunities to learn from experience about how to make better decisions.<sup>83</sup> In fact, even in the absence of paternalistic interventions, learning how to make better decisions is difficult.<sup>84</sup>

More recently, Byrnes examines motivational reasons for why people do not apply the effort and time required to engage in critical-analytic thinking.<sup>85</sup>

Although the idea that people can and should learn from their experiences of choosing poorly is intuitively plausible and seems quite reasonable, there are many difficulties with people learning from their experiences of choosing poorly.<sup>86</sup> Some of these difficulties are intrinsic to experience and some are intrinsic to people.<sup>87</sup> Learning from experiences is difficult for humans in part because of the cognitive biases and heuristics that are part of human behavior.<sup>88</sup> 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 experience, and noisiness of experience.<sup>89</sup> Decision-making researcher James March concluded that the bottom line about learning from experience is: “[e]xperience may possibly be the best teacher, but it is not a particularly good teacher.”<sup>90</sup> 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.<sup>91</sup> In addition to difficulties in learning from direct experiences, there are many other difficulties in learning from others’ experiences.<sup>92</sup>

---

<sup>83</sup> See Klick & Mitchell, *supra* note 78, at 1625–26.

<sup>84</sup> *Id.* at 1626.

<sup>85</sup> See James P. Byrnes & Kevin N. Dunbar, *The Nature and Development of Critical-Analytical Thinking*, 26 EDUC. PSYCHOL. REV. 477, 477 (2014).

<sup>86</sup> See *id.* at 489.

<sup>87</sup> See *id.* at 483, 486.

<sup>88</sup> See KAHNEMAN, *supra* note 5, at 109–265 (surveying this research).

<sup>89</sup> See JAMES MARCH, THE AMBIGUITIES OF EXPERIENCE 100–01 (2010) (examining problems inherent with the process of learning from experience).

<sup>90</sup> *Id.* at 115.

<sup>91</sup> See PAUL L. HARRIS, TRUSTING WHAT YOU’RE TOLD: HOW CHILDREN LEARN FROM OTHERS 60 (2012) (examining the importance of how children and also adults learn primarily from others instead of first-hand experience).

<sup>92</sup> See Jerker Denrell, *Vicarious Learning, Undersampling of Failure, and the Myths of Management*, 14 ORG. SCI. 227, 227 (2003).

We learn indirectly from memories of experiences as opposed to directly from ephemeral experiences.<sup>93</sup> Experiences are fleeting and momentary by their very nature.<sup>94</sup> Learning from experience is problematic due to the incomplete and selective nature of people's memories of their experiences.<sup>95</sup> Psychological research has found that ex post memories coincide with ex ante predictions instead of interim experiences.<sup>96</sup> The convergence between memories and expectations means that instead of learning from experience, people learn from selectively reconstructed memories of experiences.<sup>97</sup> People often make similar mistakes repeatedly due to imperfect learning and not seeing reality clearly for what it is.<sup>98</sup> As musician and pop star Taylor Swift states,<sup>99</sup> "But you'll come back each time you leave, [c]ause darling I'm a nightmare dressed like a daydream."

Even if people manage to learn from experience, there is the question of whether people can transfer whatever is learned across domains.<sup>100</sup> Empirical research has also found that many people, including MBA students, have difficulties with transferring lessons

<sup>93</sup> See HARRIS, *supra* note 91, at 105.

<sup>94</sup> See 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, 143 (2011) (proposing this explanation and providing supporting empirical data in the context of luxury cars).

<sup>95</sup> See Peter H. Huang, *Torn Between Two Selves: Should Law Care More About Experiencing Selves or Remembering Selves?*, 17 S.M.U. SCI. & TECH. L. REV. 263 (2014).

<sup>96</sup> See Schwarz & Xu, *supra* note 94, at 144.

<sup>97</sup> See Huang, *supra* note 95, at 295.

<sup>98</sup> *Id.* at 308.

<sup>99</sup> TAYLOR SWIFT, BLANK SPACE (Kobalt Music Publishing Ltd., Sony/ATV Music Publishing LLC) (2014); see Taylor Swift, Blank Space, TaylorSwiftVEVO, *Taylor Swift—Blank Space (Official Video)*, YOUTUBE (Nov. 10, 2014), <https://www.youtube.com/watch?v=e-ORhEE9VVg>.

<sup>100</sup> See Dedre Gentner et al., *Reviving Inert Knowledge: Analogical Abstraction Supports Relational Retrieval of Past Events*, 33 COGNITIVE SCI. 1343, 1355 (2009); Diane F. Halpern, *Teaching Critical Thinking for Transfer Across Domains: Dispositions, Skills, Structure Training, and Metacognitive Monitoring*, 53 AM. PSYCH. 449, 451 (1998); Jeffrey Loewenstein et al., *Analogical Encoding Facilitates Knowledge Transfer in Negotiation*, 6 PSYCHONOMIC BULL. & REV. 586, 592 (1999); Leigh Thompson et al., *Avoiding Missed Opportunities in Managerial Life: Analogical Training More Powerful Than Individual Case Training*, 82 ORG. BEHAV. & HUM. DECISION PROCESSES 60, 61 (2000).

that they have learned in one context to analogous yet novel contexts.<sup>101</sup> Some law students have similar difficulties with reasoning by analogy to case precedents in the common law.<sup>102</sup>

The above discussion presents the case that people will have difficulties with improving their decision-making utilizing a particular form of learning, namely learning from experiences of choosing poorly.<sup>103</sup> This Article therefore advocates other forms of learning to improve people's decision-making, namely learning about mindfulness, thinking architecture, and thinking technologies.<sup>104</sup>

### *B. Nudging or Steering People's Decision Outcomes*

A nudge is “any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives.”<sup>105</sup> As this definition makes clear, the target of nudges is behavior.<sup>106</sup> More recently, Sunstein distinguishes between educative and non-educative nudges based on whether a nudge provides information.<sup>107</sup> The most famous examples of non-educative nudges are defaults.<sup>108</sup>

Examples of educative nudges include disclosure requirements, nutrition labels, warning labels, and reminders.<sup>109</sup> Both educative and non-educative nudges steer people's behavior by utilizing cognitive biases or taking advantage of motivational deficiencies.<sup>110</sup> Even though an educative nudge is educative in the sense of providing information, an educative nudge does not

---

<sup>101</sup> See Gentner et al., *supra* note 100, at 1373–74.

<sup>102</sup> See Peter H. Huang, *Tiger Cub Strikes Back: Memoirs of an Ex-Child Prodigy About Legal Education and Parenting*, 1 BRIT. J. AM. LEGAL STUD. 297, 309 (2012) (discussing anecdotes that are related to the dangers of drawing the wrong lessons from case-based reasoning).

<sup>103</sup> *Id.* at 346.

<sup>104</sup> *Id.*

<sup>105</sup> THALER & SUNSTEIN, *supra* note 3, at 6.

<sup>106</sup> See CASS R. SUNSTEIN, *THE ETHICS OF INFLUENCE: GOVERNMENT IN THE AGE OF BEHAVIORAL SCIENCE* (2016).

<sup>107</sup> See *id.* at 6.

<sup>108</sup> *Id.* at 26–27, 34–37.

<sup>109</sup> *Id.* at 26.

<sup>110</sup> *Id.* at 42.

educate in the sense of improving people's cognitive or motivational competencies.<sup>111</sup>

The philosophy underlying nudging is “that the same factors that lead us to make a mindless suboptimal or unhealthy choice can often be reversed to help us make a mindless better choice.”<sup>112</sup> Marketing professor Brian Wansink and his co-authors have demonstrated in many studies that people often eat more than they think because they eat mindlessly.<sup>113</sup> An obvious response to mindless eating is to practice mindful eating.<sup>114</sup> Wansink believes that “[f]or 90 [percent] of us, the solution to mindless eating is not mindful eating—our lives are just too crazy and our willpower's too wimpy.”<sup>115</sup> Instead, Wansink advocates nudges or self-nudges to modify food environments.<sup>116</sup>

Wansink's 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.<sup>117</sup> For such matter over mind strategies to succeed, people must be mindful at the 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.<sup>118</sup> As Gretchen Rubin observes, “[h]abits are freeing and energizing because they eliminate decision and self-control.”<sup>119</sup>

<sup>111</sup> *Id.* at 32.

<sup>112</sup> Eric J. Johnson et al., *Beyond Nudges: Tools of Choice Architecture*, 23 *MARKETING LETTERS* 487, 500 (2012).

<sup>113</sup> See, e.g., BRIAN WANSINK, *MINDLESS EATING: WHY WE EAT MORE THAN WE THINK* (2007); see also *MINDLESS EATING*, <http://mindlesseating.org/> [<https://perma.cc/2R93-6KF6>].

<sup>114</sup> See, e.g., THICH NHAT HANH, *SAVOR: MINDFUL EATING, MINDFUL LIFE* (2011); see also *THE CENTER FOR MINDFUL EATING*, <http://www.thecenterformindfuleating.org> [<https://perma.cc/MGU6-DXT7>].

<sup>115</sup> BRIAN WANSINK, *SLIM BY DESIGN: MINDLESS EATING SOLUTIONS FOR EVERYDAY LIFE* 7 (2014).

<sup>116</sup> See *SLIM BY DESIGN*, <http://www.slimbydesign.org/> [<https://perma.cc/6LVG-ABS7>].

<sup>117</sup> Angela Duckworth et al., *Situational Strategies for Self-Control*, 11 *PERSP. PSYCH. SCI.* 35, 35 (2016).

<sup>118</sup> See *id.* at 40.

<sup>119</sup> Interview by Cassie Mogilner with Gretchen Rubin (July 17, 2015) <http://knowledge.wharton.upenn.edu/article/how-good-habits-can-make-you-happier>

Recently, there has been a backlash against nudges.<sup>120</sup> Professor Lauren Willis provides evidence that outside the automatic enrollment retirement context, defaults may fail to stick and those opting out of defaults would have benefited the most from the defaults.<sup>121</sup> Nudges defaulting employees into retirement plans have been demonstrated to lead to regret,<sup>122</sup> “may encourage irresponsible spending or early withdrawals of retirement money (with penalties) to cover debts,”<sup>123</sup> and can lead to learning less about financial matters and sharing less financial information with friends and families.<sup>124</sup> Experimental research finds that email reminders to donate to charities can backfire by annoying recipients to unsubscribe from such email lists.<sup>125</sup>

An explicit or implicit assumption of choice architecture and information architecture 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.<sup>126</sup> Choice architecture and information architecture are often contrasted with

---

*?utm\_source=kwn\_newsletter&utm\_medium=email&utm\_campaign=2015-07-22*; see also CHARLES DUHIGG, *THE POWER OF HABIT: WHY WE DO WHAT WE DO IN LIFE AND BUSINESS* 20 (2012); GRETCHEN RUBIN, *BETTER THAN BEFORE: MASTERING THE HABITS OF OUR EVERYDAY LIVES* 4–5 (2015).

<sup>120</sup> See Bruce Bower, *Nudge Backlash*, 191 *SCI. NEWS* 18, 19 (2017) (discussing some downsides of nudging).

<sup>121</sup> See Lauren E. Willis, *When Nudges Fail: Slippery Defaults*, 80 *U. CHI. L. REV.* 1155, 1155 (2013).

<sup>122</sup> See *id.* at 19–20; Jeffrey R. Brown et al., *Decision-Making Approaches and the Propensity to Default: Evidence and Implications*, 121 *J. FIN. ECON.* 477, 489 (2016) (finding employees nudged into default retirement plans had the most regret over their past pension choices).

<sup>123</sup> Bower, *supra* note 120, at 20.

<sup>124</sup> See *id.* at 20–21; Bruce Ian Carlin et al., *Libertarian Paternalism, Information Production, and Financial Decision-making*, 26 *REV. FIN. STUD.* 2204, 2220–21 (2013) (proving in an economic model that those nudged into retirement defaults may acquire less financial information and share less financial information with their friends and families).

<sup>125</sup> See Bower, *supra* note 120, at 19, 22; see also Mette Trier Damgaard & Christina Gravert, *The Hidden Cost of Nudging: Experimental Evidence on Reminders and Unsubscriptions*, 157 *J. PUB. ECON.* 15, 15–16 (2018) (documenting in two field experiments the hidden costs of charitable donation email reminder nudges in terms of annoyance and unsubscribing).

<sup>126</sup> See Shlomo Benartzi et al., *Should Government Invest More in Nudging?*, 28 *PSYCHOL. SCI.* 1051, 1057 (2017).

and touted as being cheaper than and requiring less effort of laypeople and policymakers than educating people or traditional economic policies.<sup>127</sup> For example, psychologists Elke Weber and Eric Johnson state: “standard economic analysis suggests rather expensive government interventions (such as tax incentives) or effortful (for both provider and recipient) public education.”<sup>128</sup> Although choice architecture and information architecture are low-cost or low-effort interventions,<sup>129</sup> they also are low-benefit or low-reward interventions in the sense of not producing learning benefits and rewards that can potentially spill over to many other choice situations.<sup>130</sup>

In a helpful user’s guide to debiasing,<sup>131</sup> professors Jack B. Soll, Katherine L. Milkman, and John W. Payne divide paths to improving decisions into 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.”<sup>132</sup> 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.”<sup>133</sup> Educating people about practicing mindfulness and utilizing thinking tools illustrates the first approach.<sup>134</sup>

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

---

<sup>127</sup> *Id.*

<sup>128</sup> Elke U. Weber & Eric J. Johnson, *Mindful Judgment and Decision-making*, 60 ANN. REV. PSYCHOL. 53, 75 (2009).

<sup>129</sup> See Benartzi et al., *supra* note 126, at 1051.

<sup>130</sup> *Id.* at 1042.

<sup>131</sup> Jack B. Soll et al., *A User’s Guide to Debiasing*, in I THE WILEY BLACKWELL HANDBOOK OF JUDGEMENT AND DECISION-MAKING 924, 924 (Gideon Keren & George Wu eds., 2016).

<sup>132</sup> *Id.* at 943.

<sup>133</sup> *Id.* at 925–26.

<sup>134</sup> See Peter H. Huang, *Achieving American Retirement Prosperity by Changing Americans’ Thinking About Retirement*, 22 STAN. J.L., BUS. & FIN. 189, 243–55 (2017).

accepts there is a bias and strives to create situations in which that bias is irrelevant or more commonly useful.”<sup>135</sup> Professor Shlomo Benartzi recently proposed the idea of “digital nudging, which seeks to identify online designs that help people make smarter choices.”<sup>136</sup>

Choice architecture and information architecture exemplify the second approach and often harness or take advantage of a cognitive bias to mitigate another cognitive bias.<sup>137</sup>

Modifying decision makers involves more optimism about people’s abilities and motivations to learn decision-making skills than modifying decision environments.<sup>138</sup> Finally, some interventions are classifiable as modifying decision makers and/or modifying decision environments.<sup>139</sup> For example, Soll, Milkman, and Payne describe checklists as examples of both modifying decision makers and modifying decision environments through nudges to induce reflection.<sup>140</sup>

### *C. Boosting People’s Decision-Making Competencies*

Boosts can enhance, establish, or foster many competencies.<sup>141</sup> Risk literacy boosts improve understanding statistical information in such areas as climate, health, personal finance, politics, and safety. Examples of risk literacy boosts are: (1) training of math skills in general, such as math story time with parents,<sup>142</sup> (2) brief training in converting opaque risk representations, such as single-event probabilities, into transparent risk representations, such as frequency-based representations,<sup>143</sup> (3)

---

<sup>135</sup> *Id.* at 925.

<sup>136</sup> Shlomo Benartzi, *How Digital Tools and Behavioral Economics Will Save Retirement*, HARV. BUS. REV. (2017) <https://hbr.org/2017/12/how-digital-tools-and-behavioral-economics-will-save-retirement> [<https://perma.cc/64PN-KZFF>].

<sup>137</sup> *See id.* at 2.

<sup>138</sup> *See* Michael Bond, *Risk School*, 461 NATURE 1189, 1189–92 (2009) (reporting about educating people versus nudging them).

<sup>139</sup> *Id.* at 1191.

<sup>140</sup> *See* Soll et al., *supra* note 131, at 924, 934.

<sup>141</sup> Hertwig & Grüne-Yanoff, *Nudging and Boosting*, *supra* note 11, at 979.

<sup>142</sup> *See* Talia Berkowitz et al., *Math at home adds up to achievement in school*, 350 SCI. MAG. 196, 198 (2015).

<sup>143</sup> *See generally* Peter Sedlmeier & Gerd Gigerenzer, *Teaching Bayesian Reasoning in Less Than Two Hours*, 130 J. EXPERIMENTAL PSYCHOL. 380, 380 (2001).

graphical risk representations,<sup>144</sup> (4) experienced-based instead of purely description-based representations of risk,<sup>145</sup> and (5) representations of risk, such as absolute instead of relative frequencies, that avoid biasing framing effects.<sup>146</sup> Uncertainty management boosts are procedural rules to make assessments, decisions, and predictions in the face of uncertainty when risk information is not available.<sup>147</sup> Examples of uncertainty management boosts are: (1) fast and frugal decision trees, procedural routines, and simple heuristics,<sup>148</sup> (2) simple actuarial inference methods,<sup>149</sup> and (3) simple rules of collective intelligence.<sup>150</sup> Motivational boosts

---

<sup>144</sup> See Annamaria Lusardi et al., *Visual Tools and Narratives: New Ways to Improve Financial Literacy*, 16 J. PENSION ECON. & FIN. 297, 301 (2017); David Spiegelhalter et al., *Visualizing Uncertainty About the Future*, 333 SCI. 1393, 1394 (2011); Elisabeth M. Stephens et al., *Communicating Probabilistic Information from Climate Model Ensembles: Lessons from Numerical Weather Prediction*, 3 WILEY INTERDISCIPLINARY REV.: CLIMATE CHANGE 409, 418 (2012).

<sup>145</sup> See Robin M. Hogarth & Emre Soyer, *Providing Information for Decision-making: Contrasting Description and Simulation*, 4 J. APPLIED RES. MEMORY & COGNITION 221, 223 (2015); see also Robin M. Hogarth & Emre Soyer, *Communicating Forecasts: The Simplicity of Simulated Experience*, 68 J. BUS. RES. 1800, 1802 (2015); Christine Kaufmann et al., *The Role of Experience Sampling and Graphical Displays on One's Investment Appetite*, 59 MGMT. SCI. 323, 325 (2013).

<sup>146</sup> See Gerd Gigerenzer et al., *Helping Doctors and Patients to Make Sense of Health Statistics*, 8 PSYCHOL. SCI. PUB. INT. 53, 63 (2007); David Spiegelhalter, *Risk and Uncertainty Communication*, 4 ANN. REV. STAT. APPLICATION 31, 53 (2017); Spiegelhalter et al., *supra* note 144, at 1394.

<sup>147</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 152, 156.

<sup>148</sup> HEURISTICS: THE FOUNDATIONS OF ADAPTIVE BEHAVIOR chs. 29, 31, 32, 34, 36, 39 (Gerd Gigerenzer et al. eds., 2011); see Alejandro Drexler et al., *Keeping it Simple: Financial Literacy and Rules of Thumb*, 6 AM. ECON. REV.: APPLIED ECON. 1, 2 (2014); Ralph Hertwig & Stefan M. Herzog, *Fast and Frugal Heuristics: Tools of Social Rationality*, 27 SOC. COGNITION 661, 661–62 (2009). See generally Mirjam A. Jenny et al., *Simple Rules for Detecting Depression*, 2 J. APPLIED RES. MEMORY & COGNITION 150 (2013).

<sup>149</sup> See Robyn M. Dawes et al., *Clinical Versus Actuarial Judgment*, 243 SCI. 1668, 1673 (1989); see also John A. Swets et al., *Psychological Science Can Improve Diagnostic Decisions*, 1 PSYCHOL. SCI. PUB. INT. 1, 5 (2000).

<sup>150</sup> See Stefan M. Herzog & Ralph Hertwig, *Harnessing the Wisdom of the Inner Crowd*, 18 TRENDS COGNITIVE SCI. 504, 505 (2014); Ralf H. J. M. Kurvers et al., *Detection Accuracy of Collective Intelligence Assessments for Skin Cancer Diagnosis*, 151 J. AM. MED. ASS'N DERMATOLOGY 1346 (2015); see also Ralf H. J. M. Kurvers et al., *Boosting Medical Diagnostics by Pooling Independent Judgments*, 113 PROC. NAT'L ACAD. SCI. 8777, 8777 (2016); Max Wolf et al.,

enhance the competence of autonomously adjusting cognitive control, motivation, and self-control.<sup>151</sup> Examples of motivational boosts are: (1) attention training and attention state training,<sup>152</sup> (2) psychological connectedness training,<sup>153</sup> (3) expressive writing,<sup>154</sup> (4) growth mindset or sense-of-purpose exercises,<sup>155</sup> (5) reward-bundling exercises,<sup>156</sup> (6) training in pre-commitment strategies,<sup>157</sup> (7) training in self-control strategies,<sup>158</sup> and (8) harnessing simple implementation intentions.<sup>159</sup>

Boosts are related to the simple heuristics (SH) research program,<sup>160</sup> which “has aimed to explore the cognitive mechanisms

*Collective Intelligence Meets Medical Decision-Making: The Collective Outperforms the Best Radiologist*, 10(8) PLOS ONE (e0134269), 1–3 (2015).

<sup>151</sup> See Yi-Yuan Tang & Michael I. Posner, *Attention Training and Attention State Training*, 13 TRENDS COGNITIVE SCI. 222, 224 (2009) (explaining the effectiveness of mindfulness training).

<sup>152</sup> Terrie E. Moffitt et al., *A Gradient of Childhood Self-Control Predicts Health, Wealth, and Public Safety*, 108 PROC. NAT'L ACAD. SCI. 2693, 2693 (2011); *id.* at 222; Yi-Yuan Tang et al., *Brief Meditation Training Induces Smoking Reduction*, 110 PROC. NAT'L ACAD. SCI. 13971, 13972 (2013).

<sup>153</sup> Hal E. Hershfield et al., *Increasing Saving Behavior Through Age-Progressed Renderings of the Future Self*, 48 MARKETING RES. S23, S24 (2011); Lisa Zaval et al., *How Will I Be Remembered? Conserving the Environment for the Sake of One's Legacy*, 26 PSYCHOL. SCI. 231, 231 (2015).

<sup>154</sup> Sian L. Beilock & Erin A. Maloney, *Math Anxiety: A Factor in Math Achievement Not to Be Ignored*, 2 POL'Y INSIGHTS BEHAV. & BRAIN SCI. 4, 8–9 (2015).

<sup>155</sup> David Paunesku et al., *Mind-Set Interventions Are A Scalable Treatment for Academic Underachievement*, 26 PSYCHOL. SCI. 784, 785 (2015); Aneeta Rattan et al., *Leveraging Mindsets to Promote Academic Achievement: Policy Recommendations*, 10 PERSPECTIVES PSYCHOL. SCI. 721, 722 (2015).

<sup>156</sup> GEORGE AINSLIE, PICOECONOMICS: THE STRATEGIC INTERACTION OF SUCCESSIVE MOTIVATIONAL STATES WITHIN THE PERSON 10 (1992); George Ainslie, *Specious Reward: A Behavioral Theory of Impulsiveness and Impulse Control*, 82 PSYCHOL. BULL. 463, 487 (1975).

<sup>157</sup> Thomas C. Schelling, *Self-Command in Practice, in Policy, and in a Theory of Rational Choice*, 74 AM. ECON. REV. 1, 5 (1984).

<sup>158</sup> Ayelet Fishbach & Luxi Shen, *The Explicit and Implicit Ways of Overcoming Temptation*, in DUAL PROCESS THEORIES IN THE SOCIAL MIND, 454, 459 tbl. 30.1 (Jeffrey W. Sherman et al. eds., 2014).

<sup>159</sup> Peter M. Gollwitzer, *Implementation Intentions: Strong Effects of Simple Plans*, 54 AM. PSYCHOLOGIST 493, 495 (1999).

<sup>160</sup> See, e.g., GERD GIGERENZER ET AL., SIMPLE HEURISTICS THAT MAKE US SMART 22 (1999); Norbert Donner-Banzhoff et al., *How Can Better Evidence Be Delivered?*, in BETTER DOCTORS, BETTER PATIENTS, BETTER DECISIONS:

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.”<sup>161</sup> The SH program is grounded in ecological rationality theory,<sup>162</sup> which posits “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.”<sup>163</sup>

The SH research program differs from the well-known 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.”<sup>164</sup> Psychologist Gary Klein, 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 counter-productive. They reflect a sort of hyper-rationality bias.<sup>165</sup>

While the SH research program “does not deny that people sometimes make poor decisions.”<sup>166</sup> Unlike the H&B program,

---

ENVISIONING HEALTH CARE 2020, 215, 231 (Gerd Gigerenzer & J.A. Muir Gray eds., 2011).

<sup>161</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 151.

<sup>162</sup> Peter M. Todd & Gerd Gigerenzer, *Environments That Make Us Smart: Ecological Rationality*, 16 CURRENT DIRECTIONS PSYCHOL. SCI. 167, 167–68 (2007); Peter M. Todd, *How Much Information Do We Need?*, 177 EUR. J. ORG. RES. 1317, 1317 (2006).

<sup>163</sup> John M. Flach et al., *Approaches to Cognitive Bias in Serious Games for Critical Thinking*, 56 PROC. HUM. FACTORS & ECON. SOC. ANN. MEETING 272, 274 (2012).

<sup>164</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 150.

<sup>165</sup> Flach et al., Professor, Wright State University, Proceedings of the Human Factors and Ergonomics Society 56th Annual Meeting: Approaches to Cognitive Bias in Serious Games for Critical Thinking (2012).

<sup>166</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 151.

however, it does not attribute these behaviors to profoundly flawed mental software.<sup>167</sup> Instead, it presents a vision of bounded rationality according to which human reasoning and decision-making can be modeled in terms of SH ....<sup>168</sup> 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.”<sup>169</sup>

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.”<sup>170</sup> In contrast, under the SH research program, “policies should aim to extend the decision-making competencies of laypeople and professionals alike.<sup>171</sup> To this end, interventions can target the individual’s skills and knowledge, the available set of decision tools, or the environment in which decisions are made.”<sup>172</sup> Nudging assumes that “people tend to be somewhat mindless, passive decision makers.”<sup>173</sup> 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.”<sup>174</sup> Therefore although many boosts aim to modify decision makers,<sup>175</sup> some boosts aim to modify decision environments.<sup>176</sup>

The SH research program does “not deny that people are not perfect thinkers and, at times, make bad decisions (for a variety of reasons).<sup>177</sup> However, the difference to the H&B program

---

<sup>167</sup> *Id.*

<sup>168</sup> *Id.*

<sup>169</sup> *Id.*

<sup>170</sup> *Id.* at 152.

<sup>171</sup> *Id.*

<sup>172</sup> *Id.*

<sup>173</sup> THALER & SUNSTEIN, *supra* note 3, at 37.

<sup>174</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 152.

<sup>175</sup> Soll et al., *supra* note 131, at 926.

<sup>176</sup> *Id.*

<sup>177</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 163.

is that these difficulties are not assumed to be so impervious to change that they have to be exploited rather than overcome.”<sup>178</sup> 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”<sup>179</sup> or more precisely better outcomes being nudged on 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.<sup>180</sup> Even when boosts and nudges overlap, the causal mechanisms underlying the rationales for those policies differ.<sup>181</sup> In the case of defaults, proponents of nudges explain how effective defaults are by “inertia, status-quo bias, or the ‘yeah, whatever heuristic’”<sup>182</sup> and in so doing are “revealing the policy to be *re*biasing.”<sup>183</sup> 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 *de*biasing.”<sup>184</sup>

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.<sup>185</sup> Nudging does not assume that people have awareness or controllability of cognitive errors, while boosting assumes that people can detect and mitigate cognitive errors.<sup>186</sup> Nudging assumes that policymakers have information about people’s goals or the distribution of people’s goals

---

<sup>178</sup> *Id.*

<sup>179</sup> *Id.*

<sup>180</sup> *Id.*

<sup>181</sup> *Id.*

<sup>182</sup> THALER & SUNSTEIN, *supra* note 3, at 83.

<sup>183</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 163.

<sup>184</sup> *Id.*

<sup>185</sup> *Id.* at 164, tbl. 1.

<sup>186</sup> *Id.* at 164–65.

in the presence of goal heterogeneity, while boosting does not require such strong informational assumptions.<sup>187</sup> Nudging assumes that policymakers are less cognitively error prone than laypeople and are benevolent, while boosting does not make such assumptions about policymakers' cognition or motivation.<sup>188</sup> 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.<sup>189</sup>

Philosopher Till Grüne-Yanoff and psychologist Ralph Hertwig compare to what degree the H&B and SH research programs about bounded rationality support the above necessary underlying policy assumptions of nudges and boosts respectively.<sup>190</sup> Grüne-Yanoff and Hertwig conclude 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.<sup>191</sup> They also conclude that "criticism that nudge[s] policies infringe on human autonomy and dignity do not apply (or applies less) to boost policies."<sup>192</sup>

Nudges and boosts differ in their assumptions about people's cognitive architecture, which is the infrastructure of how people process information.<sup>193</sup> Cognitive architecture includes such mental hardware as memory structures for storing knowledge, beliefs, and goals.<sup>194</sup> Cognitive architecture also includes such functional processes that operate on mental hardware as cognitive algorithms, reasoning processes, and heuristics.<sup>195</sup> Nudges assume that people have a dual system cognitive architecture of system 1 versus 2,<sup>196</sup> while boosts do not assume that people

---

<sup>187</sup> *Id.* at 165–66.

<sup>188</sup> *Id.* at 166–67.

<sup>189</sup> *Id.* at 167–68.

<sup>190</sup> *Id.* at 168–74.

<sup>191</sup> *Id.* at 174–75.

<sup>192</sup> *Id.* at 176.

<sup>193</sup> Hertwig & Grüne-Yanoff, *Nudging and Boosting*, *supra* note 11, at 979.

<sup>194</sup> *Id.*

<sup>195</sup> *Id.*

<sup>196</sup> *Id.* at 980.

have a particular cognitive architecture.<sup>197</sup> Boosts assume that whatever people's cognitive architecture is, that cognitive architecture is "malleable and worth developing."<sup>198</sup> In particular, boosts assume people's current mental tools can be enhanced or that people can learn to utilize new procedural rules.<sup>199</sup> Boosts focus on fostering people's competencies, including redesigning people's external environments or teaching people how to redesign their external environments.<sup>200</sup>

An empirical and pragmatic difference between boosts and nudges is their permanence or reversibility.<sup>201</sup> Because boosts aim to enhance people's existing cognitive and motivational competencies or establish new cognitive and motivational competencies, those competencies should persist, meaning their consequences on behavior should also be stable and permanent over time after the boost stops.<sup>202</sup> Because nudges change the choice architecture and do not alter people's existing cognitive and motivational competencies, those competencies do not improve, meaning that behavior will revert back if a nudge is eliminated.<sup>203</sup> A nudge can transform into a boost if that nudge unintentionally improves cognitive and motivational competencies.<sup>204</sup>

Hertwig proposes these six rules to help guide policymakers in determining to employ boosts or nudges.<sup>205</sup> First, when people do not have the cognitive capacities or motivation to develop new competencies or skills, nudge instead of boost.<sup>206</sup> Second, when policymakers are unsure about people's goals, when there is a lot of diversity over society in goals, or when a person has conflicting goals, boosts are less prone to errors than nudges.<sup>207</sup> Third, when nudging requires nontransparency or invisibility to those who are nudged, nudging is paternalistic because it fails

---

<sup>197</sup> *Id.* at 975–76, 980.

<sup>198</sup> *Id.* at 980.

<sup>199</sup> *Id.*

<sup>200</sup> *Id.*

<sup>201</sup> *Id.* at 980–81.

<sup>202</sup> *Id.*

<sup>203</sup> *Id.* at 981.

<sup>204</sup> *Id.*

<sup>205</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 149.

<sup>206</sup> *Id.*

<sup>207</sup> *Id.* at 151.

the easy reversibility criterion.<sup>208</sup> Fourth, when governments are not always benevolent, or when governments allow private actors to create toxic choice architectures, boosts protect people better than nudges.<sup>209</sup> Fifth, when policymakers endeavor to foster permanent behavioral changes and generalizable across many choice architectures, boost instead of nudge.<sup>210</sup> Sixth, when there are significant risks of unanticipated or unpredictable consequences of a boost or nudge, consider its respective alternative.<sup>211</sup>

To Hertwig's helpful rules, this Article adds these additional rules. Seventh, when people face the same or similar decisions in one context repeatedly, boost instead of nudge because an effective boost is one-time as opposed to nudges that have to be repeated.<sup>212</sup> Eighth, when people face similar decisions across different settings, boost instead of nudge because an effective boost is a one-time intervention as opposed to having to make multiple nudges across settings.<sup>213</sup> Ninth, when people face decisions that are likely to change over time, boost instead of nudge because an effective one-time boost will enable people to adapt internally to changes as opposed to nudges that have to be changed externally over time.<sup>214</sup> Tenth, when people face decisions that are personal or private, boost instead of nudge because a boost is more likely to lead to reflection and introspection.<sup>215</sup> Eleventh, when people face decisions that are irreversible or costly to reverse, boost instead of nudge because a boost is more likely to engage in people taking care and paying attention. Twelfth, utilize a boost when that boost involves play and fun because that boost is likely to become self-motivating and self-sustaining through adrenaline, dopamine, engagement, excitement, harnessing competitive instincts, positive emotions, and stimulating brain reward centers.<sup>216</sup>

---

<sup>208</sup> *Id.* at 152.

<sup>209</sup> *Id.* at 154.

<sup>210</sup> *Id.* at 155.

<sup>211</sup> *Id.* at 149.

<sup>212</sup> *Id.* at 155.

<sup>213</sup> *Id.*

<sup>214</sup> *Id.*

<sup>215</sup> Hertwig & Grüne-Yanoff, *Nudging and Boosting*, *supra* note 11, at 982.

<sup>216</sup> Hersh Shefrin, BORN TO SPEND? HOW NATURE AND NURTURE IMPACT SPENDING AND BORROWING HABITS 20, 22 (Chase Blueprint Apr. 2013) [https://dlshowonline.com/wp-content/uploads/2014/12/Born\\_to\\_Spend\\_Hersh\\_On\\_money\\_personality.pdf](https://dlshowonline.com/wp-content/uploads/2014/12/Born_to_Spend_Hersh_On_money_personality.pdf) [<https://perma.cc/3H4T-X4DL>].

This Article advocates boosting people’s decision-making competencies by practicing mindfulness and utilizing thinking tools. Mindfulness and thinking tools are 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).”<sup>217</sup> All the boosts that this Article advocates aim to transform people into better decision makers by expanding their portfolios of decision-making abilities, decision-making information, and decision-making tools.<sup>218</sup> While Grüne-Yanoff and Hertwig advocate teaching financial literacy,<sup>219</sup> 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,”<sup>220</sup> this Article advocates novel 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<sup>221</sup> and utilizing serious games to help people learn about cognitive biases and improve their decision-making.<sup>222</sup> The play aspect of both of these types of games may also make it more likely that people are both able to acquire trained skills and motivated to utilize trained skills.<sup>223</sup> 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.<sup>224</sup>

This Article advocates boosts that enable people to improve decision-making competencies by thinking more mindfully, systematically, and effectively.

---

<sup>217</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 156.

<sup>218</sup> Hertwig, *supra* note 11, at 143.

<sup>219</sup> Grüne-Yanoff & Hertwig, *Nudge Versus Boost*, *supra* note 11, at 162.

<sup>220</sup> Daniel Fernandes et al., *Financial Literacy, Financial Education and Downstream Financial Behaviors*, 60 MGMT. SCI. 1861, 1861 (2014).

<sup>221</sup> Huang, *supra* note 134, at 245.

<sup>222</sup> *Id.*

<sup>223</sup> STUART BROWN & CHRISTOPHER VAUGHN, PLAY: HOW IT SHAPES THE BRAIN, OPENS THE IMAGINATION, AND INVIGORATES THE SOUL 34 (2009).

<sup>224</sup> Peter H. Huang, *Can Practicing Mindfulness Improve Lawyer Decision-Making, Ethics, and Leadership?*, 55 HOUS. L. REV. 66, 125–26 (2017).

*D. Soft Paternalism versus Positive Parentonomics*

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.<sup>225</sup> Defaulting people into 401(k) retirement plans exemplifies the idea of what is known as soft paternalism,<sup>226</sup> which includes libertarian paternalism that preserves freedom of choice, while influencing choices to make people better off;<sup>227</sup> asymmetric paternalism that produces large benefits for those prone to decision-making errors, while imposing small costs on those not so prone;<sup>228</sup> cautious paternalism that requires policymakers to determine precise conditions under which benefits outweigh costs;<sup>229</sup> and light paternalism that enhances individual choice without restricting it.<sup>230</sup>

All the above types of soft paternalism share the common feature of modifying the decision-making contexts that people face

---

<sup>225</sup> Sumit Agarwal et al., *The Age of Reason: Financial Decisions over the Life Cycle with Implications for Regulation*, in BROOKINGS PAPERS ON ECONOMIC ACTIVITY, Fall 2009, 51, 55–78 (providing medical, psychological, and financial evidence of older Americans' vulnerability to financial decision errors); *id.* at 80–90 (discussing nine possible regulatory responses); Tibor Besedeš et al., *Age Effects and Heuristics in Decision-making*, 94 REV. ECON. & STAT. 580, 581 (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 Besedeš 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).

<sup>226</sup> Jim Holt, *The New, Soft Paternalism*, N.Y. TIMES, Dec. 3, 2006, at E15.

<sup>227</sup> Cass R. Sunstein & Richard H. Thaler, *Libertarian Paternalism Is Not an Oxymoron*, 70 U. CHI. L. REV. 1159, 1162 (2003); Richard H. Thaler & Cass R. Sunstein, *Libertarian Paternalism*, 93 AM. ECON. REV. 175, 175 (2003).

<sup>228</sup> Colin Camerer et al., *Regulation for Conservatives: Behavioral Economics and the Case for "Asymmetric Paternalism"*, 151 U. PA. L. REV. 1211, 1212 (2003).

<sup>229</sup> Ted O'Donoghue & Mathew Rabin, *Procrastination in Preparing for Retirement*, in BEHAVIORAL DIMENSIONS OF RETIREMENT ECONOMICS 125, 129, 150 (Henry J. Aaron ed., 1999).

<sup>230</sup> George Loewenstein & Emily Celia Harris, *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).

in order to improve the outcomes resulting from people's unmodified, existing decision-making.<sup>231</sup> 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 thus 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.<sup>232</sup>

A new type of soft paternalism, known as autonomy-enhancing paternalism (AEP), aims to “support individuals’ ability to make autonomous decisions,”<sup>233</sup> defining autonomy<sup>234</sup> as “the capacity of a person ... to reflect upon, and then attempt to accept or change his or her preferences, desires, values, and ideals.”<sup>235</sup> 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.”<sup>236</sup> AEP advocates “using behavioral insights to modify the choice architecture in a way that promotes critical reflection”<sup>237</sup> 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 to other forms

---

<sup>231</sup> See Holt, *supra* note 226, at E16.

<sup>232</sup> Jeremy Waldron, *It's All for Your Own Good*, N.Y. REV. BOOKS (Oct. 9, 2014), <http://www.nybooks.com/articles/archives/2014/oct/09/cass-sunstein-its-all-your-own-good/> [<http://perma.cc/4QD7-QDJF>] (reviewing CASS R. SUNSTEIN, *WHY NUDGE? THE POLITICS OF LIBERTARIAN PATERNALISM* (2014)).

<sup>233</sup> Martin Binder & Leonhard K. Lades, *Autonomy-Enhancing Paternalism*, 68 KYKLOS 3, 4 (2015).

<sup>234</sup> RONALD DWORKIN, *THE THEORY AND PRACTICE OF AUTONOMY* 48 (Sydney Shoemaker et al. eds., 1988).

<sup>235</sup> Binder & Lades, *supra* note 233, at 5 (quoting DWORKIN, *supra* note 234, at 48).

<sup>236</sup> *Id.* at 4.

<sup>237</sup> *Id.* at 6.

of soft paternalism that aim to improve the *outcomes* of decision-making processes without concerning themselves with how the decisions come about.”<sup>238</sup> AEP entails “interventions that change the choice architecture to help individuals to become good decision-makers, who are able to ... make critically reflected decisions.”<sup>239</sup> AEP realizes that “interventions can influence individuals’ abilities to learn about both their cognitive biases and their preferences<sup>240</sup> ... [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 other[s] ...”<sup>241</sup> 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.”<sup>242</sup> AEP transforms choice contexts with a goal of improving people’s decision-making processes.<sup>243</sup>

This Article focuses on additional ways to improve decision-making competencies by democratizing practicing mindfulness and thinking tools.<sup>244</sup> This Article advances the notion of *positive parentonomics*,<sup>245</sup> extending *positive parentalism*,<sup>246</sup> an original regulatory proposal advocating that policymakers “develop[ ] institutions ... [to] help enable [people,] ... communities[, and societies] to flourish and thrive.”<sup>247</sup> Instead of negative and gendered connotations that come with paternalism and the idea of “father knows best,” positive parentalism entails positive and gender-neutral notions of parenting in fostering people to choose

---

<sup>238</sup> *Id.*

<sup>239</sup> *Id.*

<sup>240</sup> *Id.*

<sup>241</sup> *Id.* at 5 (quoting DWORKIN, *supra* note 234, at 48).

<sup>242</sup> *Id.*

<sup>243</sup> *Id.*

<sup>244</sup> Richard P. Larrick, *Debiasing*, in BLACKWELL HANDBOOK OF JUDGMENT AND DECISION-MAKING 316, 317, 323–31 (Derek J. Koehler & Nigel Harvey eds., 2004).

<sup>245</sup> See generally Peter H. Huang et al., *Positive Institutions: Organizations, Laws, and Policies*, in OXFORD HANDBOOK OF POSITIVE PSYCHOLOGY (C.R. Snyder, Shane J. Lopez, Lisa M. Edwards, and Susana C. Marques eds., forthcoming) (providing additional details about positive parentonomics).

<sup>246</sup> Jeremy A. Blumenthal & Peter H. Huang, *Positive Parentalism*, NAT’L L.J. (Jan. 26, 2009), <https://www.law.com/nationallawjournal/almID/1202427700551/positive-parentalism/> [<http://perma.cc/XD23-8UZH>].

<sup>247</sup> *Id.*

wisely across many different choice settings.<sup>248</sup> Positive parentonomics is 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 happier and more meaningful lives.<sup>249</sup> 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 and employing thinking boosts, including thinking technologies and diversity.<sup>250</sup>

### *E. Intellectual Virtues*

Many boosts involve teaching and learning different mindsets or ways of thinking to improve decision-making competencies.<sup>251</sup> While such boosts differ in details, they share the common feature of being more likely to be successful if people are motivated and engaged to learn.<sup>252</sup> Loyola Marymount University philosophy professor, Jason Baehr, defines intellectual virtues to be “deep personal qualities or character strengths required for good thinking and learning.”<sup>253</sup> Baehr proposes these nine foundational intellectual virtues<sup>254</sup>: curiosity, intellectual autonomy, intellectual humility, attentiveness, intellectual carefulness, intellectual thoroughness, open-mindedness, intellectual courage, and intellectual tenacity. Baehr divides these intellectual virtues into three groups.<sup>255</sup> First are intellectual virtues necessary to motivate the process of learning and towards the right direction: curiosity, intellectual autonomy, and intellectual humility.<sup>256</sup> Second are intellectual virtues necessary to maintain the process of learning on

---

<sup>248</sup> Blumenthal & Huang, *supra* note 246.

<sup>249</sup> DACHER KELTNER, BORN TO BE GOOD: THE SCIENCE OF A MEANINGFUL LIFE 11–13 (2009).

<sup>250</sup> Blumenthal & Huang, *supra* note 246.

<sup>251</sup> See Hertwig & Grüne-Yanoff, *Nudging and Boosting*, *supra* note 11, at 146.

<sup>252</sup> See JASON BAEHR, CULTIVATING GOOD MINDS: A PHILOSOPHICAL & PRACTICAL GUIDE TO EDUCATING FOR INTELLECTUAL VIRTUES 93 (2015).

<sup>253</sup> *What Are Intellectual Virtues?*, EDUCATING FOR INTELLECTUAL VIRTUES, <http://intellectualvirtues.org/what-are-intellectual-virtues/> [<http://perma.cc/AJS8-3CKB>].

<sup>254</sup> *Master Virtues*, INTELLECTUAL VIRTUES ACADEMY, <http://www.ivalongbeach.org/academics/master-virtues> [<http://perma.cc/79W8-5XHH>].

<sup>255</sup> BAEHR, *supra* note 252, at 57–58.

<sup>256</sup> *Id.* at 57.

the right path: attentiveness, intellectual carefulness, and intellectual thoroughness.<sup>257</sup> Third are intellectual virtues necessary to surmount learning challenges and obstacles: open-mindedness, intellectual courage, and intellectual tenacity.<sup>258</sup>

Curiosity is a source of intrinsic intellectual motivation and consists of wondering, pondering, and asking why questions. Intellectual autonomy entails an active willingness, courage, and ability to think for yourself.<sup>259</sup> Intellectual humility means an alertness towards, and a willingness to admit, intellectual limitations, mistakes, and weaknesses.<sup>260</sup> Attentiveness involves being present, active listening, and focused observation about important details.<sup>261</sup>

Intellectual carefulness facilitates “avoiding intellectual errors or mistakes, [such as] false beliefs and ignorance.”<sup>262</sup> Intellectual thoroughness means a disposition to probe for deeper meaning and understanding in acquiring and communicating knowledge.<sup>263</sup> Open-mindedness is a willingness and ability to consider alternative viewpoints, revise beliefs, and think outside the proverbial box.<sup>264</sup> Intellectual courage is readiness to take intellectual risks by persisting in thinking when there is fear of embarrassment or failure.<sup>265</sup> Intellectual perseverance is a “tendency [and willingness] to embrace intellectual challenge and struggle.”<sup>266</sup>

In a 563-page resource guide,<sup>267</sup> Baehr provides an overview about intellectual virtues,<sup>268</sup> in addition to a closer examination of each intellectual virtue, with examples of each from history (e.g., Copernicus and Galileo) and literature (e.g., Jane Eyre and Hermione Granger), that includes discussion questions: curiosity,<sup>269</sup> intellectual autonomy,<sup>270</sup> intellectual humility,<sup>271</sup> attentiveness,<sup>272</sup>

---

<sup>257</sup> *Id.* at 57–58.

<sup>258</sup> *Id.* at 57.

<sup>259</sup> *Id.* at 70.

<sup>260</sup> *Id.* at 80.

<sup>261</sup> *Id.* at 94–95.

<sup>262</sup> *Id.* at 104.

<sup>263</sup> *Id.* at 117.

<sup>264</sup> *Id.* at 126.

<sup>265</sup> *Id.* at 139.

<sup>266</sup> *Id.* at 150.

<sup>267</sup> *Id.* at 150.

<sup>268</sup> *Id.* at 16–54.

<sup>269</sup> *Id.* at 57–68.

<sup>270</sup> *Id.* at 70–77.

<sup>271</sup> *Id.* at 79–91.

<sup>272</sup> *Id.* at 93–102.

intellectual carefulness,<sup>273</sup> intellectual thoroughness,<sup>274</sup> open-mindedness,<sup>275</sup> intellectual courage,<sup>276</sup> and intellectual tenacity.<sup>277</sup> Baehr offers a number of practices to foster intellectual virtues outside classroom settings<sup>278</sup> and inside classroom settings.<sup>279</sup> Baehr also discusses how to measure growth in intellectual virtues.<sup>280</sup>

## II. MINDFULNESS

Much of the current interest and popularity about being more mindful among athletes,<sup>281</sup> businesses<sup>282</sup> (such as Google<sup>283</sup>), law schools and lawyers,<sup>284</sup> organizations<sup>285</sup> (such as the military<sup>286</sup>), and laypeople<sup>287</sup> is due to psychological and neuroscience

<sup>273</sup> *Id.* at 104–15.

<sup>274</sup> *Id.* at 117–24.

<sup>275</sup> *Id.* at 126–37.

<sup>276</sup> *Id.* at 139–48.

<sup>277</sup> *Id.* at 150–61.

<sup>278</sup> *Id.* at 164–271.

<sup>279</sup> *See id.* at 274–495.

<sup>280</sup> *See id.* at 524–41.

<sup>281</sup> GEORGE MUMFORD, *THE MINDFUL ATHLETE: SECRETS TO PURE PERFORMANCE* (2015); Interview with George Mumford, *The Lakers Meditate?*, *MINDFUL* (Apr. 15, 2011), <http://www.mindful.org/the-lakers-meditate/> [<http://perma.cc/R4HY-SY2M>]; Christine Yu, *Mindfulness for Athletes: The Secret to Better Performance?*, *LIFE BY DAILY BURN* (June 10, 2014), <http://dailyburn.com/life/fitness/mindfulness-techniques-athletes/> [<http://perma.cc/6VA4-RLFP>].

<sup>282</sup> *See, e.g.*, Antonia Macaro & Julian Baggini, *Business on the Mindfulness Bandwagon*, *FIN. TIMES MAG.* (Mar. 13, 2015), <http://www.ft.com/cms/s/0/ee65c5e4-c82f-11e4-8fe2-00144feab7de.html> [<http://perma.cc/S22M-FJS5>].

<sup>283</sup> CHADE-MENG TAN, *SEARCH INSIDE YOURSELF: THE UNEXPECTED PATH TO ACHIEVING SUCCESS, HAPPINESS (AND WORLD PEACE)* 3 (2012).

<sup>284</sup> Jacob Gershman, *Lawyers Go Zen, With Few Objections*, *WALL ST. J.* (June 18, 2015), <http://www.wsj.com/articles/lawyers-go-zen-with-few-objections-1434586250> [<http://perma.cc/J2RG-6EBJ>].

<sup>285</sup> Jacqueline Carter, *Mindfulness as a Foundation for Organizational Effectiveness*, *HUFFINGTON POST* (Jan. 17, 2014), [http://www.huffingtonpost.com/jacqueline-carte/corporate-based-mindfulness\\_b\\_4597952.html](http://www.huffingtonpost.com/jacqueline-carte/corporate-based-mindfulness_b_4597952.html) [<http://perma.cc/PF8R-WBB4>].

<sup>286</sup> *See, e.g.*, Alena Hall, *How Mindfulness Practices Can Help Prepare Military Members for Future Combat*, *HUFFINGTON POST* (Mar. 10, 2015), [http://www.huffingtonpost.com/2015/03/10/mindfulness-in-the-military\\_n\\_6833402.html](http://www.huffingtonpost.com/2015/03/10/mindfulness-in-the-military_n_6833402.html) [<http://perma.cc/4QSG-VZQ8>].

<sup>287</sup> Frances Weaver, *The Mainstreaming of Mindfulness Meditation*, *WEEK* (Apr. 5, 2014), <http://theweek.com/articles/448250/mainstreaming-mindfulness-meditation> [<http://perma.cc/2UW7-GHAQ>].

studies finding that being more mindful improves physical health, mental health, and well-being,<sup>288</sup> cultivates emotional intelligence,<sup>289</sup> reduces anxiety and stress,<sup>290</sup> and improves focus and productivity.<sup>291</sup>

Whether mindfulness leads to more ethical behavior depends upon one's precise definition of mindfulness and exactly what one is mindful about.<sup>292</sup> If mindfulness is defined as paying attention in a caring, discerning, and open-hearted way, with kind 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.<sup>293</sup> People can also be narrow or wide in the scope of what people are mindful about.<sup>294</sup>

#### A. Cognitive Biases as Forms of Mindlessness

People often choose poorly when they act mindlessly or without much awareness, as if acting on automatic pilot.<sup>295</sup> It is cognitively too demanding to pay attention to all the stimuli that people receive because attention is a finite, scarce resource.<sup>296</sup> To what we pay attention is very often unconsciously determined.<sup>297</sup> Psychology professors Christopher Chabris and Daniel Simons' famous "invisible gorilla experiment"<sup>298</sup> illustrates that people can exhibit

---

<sup>288</sup> *Benefits of Mindfulness*, HARV. HEALTH PUBLICATIONS, <http://www.helpguide.org/harvard/benefits-of-mindfulness.htm> [<http://perma.cc/E45P-FAYG>].

<sup>289</sup> Carolyn Gregoire, *Why Mindfulness Is The Foundation Of Emotional Intelligence*, HUFFINGTON POST (Oct. 31, 2014), [http://www.huffingtonpost.com/2014/10/31/search-inside-yourself\\_n\\_6061586.html](http://www.huffingtonpost.com/2014/10/31/search-inside-yourself_n_6061586.html) [<http://perma.cc/KPT7-GNE6>].

<sup>290</sup> Debra S. Austin, *Killing Them Softly: Neuroscience Reveals How Brain Cells Die from Law School Stress and How Neural Self-Hacking Can Optimize Cognitive Performance*, 59 LOY. L. REV. 791, 838–42 (2013) (discussing the benefits of mindfulness).

<sup>291</sup> Peter H. Huang, *Happiness Studies and Legal Policy*, 6 ANN. REV. L. & SOC. SCI. 405, 420–22 (2010) (analyzing benefits of mindfulness meditation and loving-kindness meditation).

<sup>292</sup> Huang, *supra* note 56, at 54, 59.

<sup>293</sup> *Id.* at 59–61.

<sup>294</sup> *Id.* at 64–65.

<sup>295</sup> *Id.* at 59.

<sup>296</sup> CHRISTOPHER CHABRIS & DANIEL SIMONS, *THE INVISIBLE GORILLA AND OTHER WAYS OUR INTUITIONS DECEIVE US* 6–7, 38 (2010).

<sup>297</sup> *Id.* at 230–31.

<sup>298</sup> *Id.* at 5–7; Christopher Chabris & Daniel Simons, *Gorilla Experiment*, *INVISIBLE GORILLA* (2010), [http://www.theinvisiblegorilla.com/gorilla\\_experiment.html](http://www.theinvisiblegorilla.com/gorilla_experiment.html) [<https://perma.cc/KC2G-DL6U>].

inattentional blindness resulting from paying selective attention. It is not possible to always be mindful of everything due to finite cognition.<sup>299</sup> People can learn to choose to be mindful in their mindlessness.<sup>300</sup> 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 a baby locked in your car on a hot day because you will have to get your shoe before or immediately upon leaving your car.<sup>301</sup>

Economics professor Xavier Gabaix proposes a tractable model of bounded rationality based on the theme of people having limited attention.<sup>302</sup> In his model, people (just like economists) create simplified models of the world and think about reality via their models.<sup>303</sup> People's models necessarily entail a representation of reality that is sparse,<sup>304</sup> in the sense that only very few of the many possible parameters and variables of reality are represented as being nonzero.<sup>305</sup> People only choose to pay attention to, or think about, those variables to which people assign nonzero values.<sup>306</sup> In Gabaix's model, people choose how much attention to pay to aspects of reality by balancing the benefits and costs of thinking.<sup>307</sup> To avoid the infinite regress problem of thinking optimally about how much to think, Gabaix's model makes the simplifying assumption that people's utility losses from inattention are linear-quadratic functions.<sup>308</sup> The underlying intuition of Gabaix's model is that people pay more attention to things that are more volatile, matter more for their decisions, entail big losses if they make imperfect decisions, and if the psychic cost of paying attention is

---

<sup>299</sup> CHABRIS & SIMONS, *supra* note 296, at 38; Peter H. Huang, *Meta-Mindfulness: A New Hope*, 19 RICH. J.L. PUB. INT. 303, 316 (2016).

<sup>300</sup> Huang, *supra* note 299, at 314, 316.

<sup>301</sup> See Melanie Payne, *Shoe Trick Will Prevent Child Deaths in Hot Cars*, NEWS-PRESS (June 20, 2014), <https://www.news-press.com/story/news/investigations/melanie-payne/2014/06/20/tell-mel-neverleft-campaign/11102697/> [<https://perma.cc/KNZ4-2N67>].

<sup>302</sup> Xavier Gabaix, *A Sparsity-Based Model of Bounded Rationality*, 129 Q.J. ECON. 1661, 1661, 1663 (2014).

<sup>303</sup> *Id.* at 1662.

<sup>304</sup> *Id.* at 1662–63.

<sup>305</sup> *Id.*

<sup>306</sup> *Id.* at 1669, 1673.

<sup>307</sup> *Id.* at 1670.

<sup>308</sup> *Id.* at 1699–1700.

low.<sup>309</sup> The overarching idea of mindfulness is to develop the ability to be able to pay attention to those aspects of reality that matter in any given situation.<sup>310</sup> Learning how to discern what matters is part of practicing mindfulness and meta-mindfulness.<sup>311</sup>

Gabaix analyzes how numerous cognitive biases in behavioral economics reflect a particular form of inattention,<sup>312</sup> such as inattention to true prices and the shrouding of add-on costs,<sup>313</sup> inattention to taxes,<sup>314</sup> neglected risks,<sup>315</sup> hyperbolic discounting being global inattention to the future,<sup>316</sup> prospect theory being inattention to true probabilities,<sup>317</sup> overconfidence being inattention to one's true ability,<sup>318</sup> believing one's beliefs to be more accurate than they are being inattention to the precision of one's signals,<sup>319</sup> underestimating the correlation between strategies in a game being attention to conditional probability,<sup>320</sup> projection bias being local inattention to future circumstances by anchoring on present circumstances,<sup>321</sup> base-rate neglect being inattention to base probabilities,<sup>322</sup> correlation neglect being inattention to correlation of random variables,<sup>323</sup> insensitivity to sample size being inattention to sample size,<sup>324</sup> over- and under-reaction to news being inattention to autocorrelation of a stochastic time

---

<sup>309</sup> *Id.* at 1671–72.

<sup>310</sup> Huang, *supra* note 299, at 313–14.

<sup>311</sup> *Id.* at 314, 317.

<sup>312</sup> Gabaix, *supra* note 302, at 1695; Xavier Gabaix, *Behavioral Inattention*, in HANDBOOK OF BEHAVIORAL ECONOMICS (Douglas Bernheim, Stefano DellaVigna & David Laibson eds., forthcoming) (draft chapters at 9–16).

<sup>313</sup> Xavier Gabaix, *supra* note 312, at draft chapters 10, 22, 24, 27 tbl.1).

<sup>314</sup> *Id.* at 10, 21–22, 27 tbl.1.

<sup>315</sup> *Id.* at 10–11.

<sup>316</sup> *Id.* at 11, 22.

<sup>317</sup> *Id.* at 11–12.

<sup>318</sup> *Id.* at 13.

<sup>319</sup> Gabaix, *supra* note 312, at 13.

<sup>320</sup> *Id.*

<sup>321</sup> Gabaix, *supra* note 302, at Online Appendix, 44–45; Gabaix, *supra* note 312, at 13.

<sup>322</sup> Gabaix, *supra* note 302, at Online Appendix, 43–44; Gabaix, *supra* note 312, at 13.

<sup>323</sup> Gabaix, *supra* note 312, at 13–14.

<sup>324</sup> Gabaix, *supra* note 302, at Online Appendix, 45–46; Gabaix, *supra* note 312, at 14.

series,<sup>325</sup> left-digit bias being inattention to non-leading digits,<sup>326</sup> exponential growth bias being inattention to compounding of interest rates,<sup>327</sup> and insensitivity to predictability, misconceptions of regression to the mean, and illusion of validity all being forms of inattention to the stochasticity of the world.<sup>328</sup>

### *B. How Mindfulness Can Improve Decision-Making*

Experimental research finds that practicing mindfulness reduces these cognitive biases: affective impact bias,<sup>329</sup> implicit age bias,<sup>330</sup> implicit race bias,<sup>331</sup> and sunk-cost bias.<sup>332</sup> In addition, practicing mindfulness can reduce racially discriminatory behavior<sup>333</sup> and reduce pursuing personally costly vengeance or revenge in ultimatum games.<sup>334</sup> More generally, practicing mindfulness can decrease the impact of cognitive biases by improving people's decision-making through improving people's moods and reducing people's anxiety and negative affect.<sup>335</sup>

Co-founder of the Civility Project at Johns Hopkins, Professor Forni, memorably states that “[m]istakes are bad choices we make when we are not ready to make good ones.”<sup>336</sup> Soll, Milkman,

---

<sup>325</sup> Gabaix, *supra* note 312, at 14–15, 24–26, 27 tbl.1.

<sup>326</sup> *Id.* at 15, 23–24, 27 tbl.1.

<sup>327</sup> *Id.* at 15.

<sup>328</sup> Gabaix, *supra* note 302, at Online Appendix, 45; Gabaix, *supra* note 312, at 14.

<sup>329</sup> Amber S. Emanuel et al., *The Role of Mindfulness Facets in Affective Forecasting*, 49 PERSONALITY & INDIVIDUAL DIFFERENCES 815, 816–18 (2010).

<sup>330</sup> 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, 287–89 (2015).

<sup>331</sup> *Id.*

<sup>332</sup> Andrew C. Hafenbrack et al., *Debiasing the Mind Through Meditation: Mindfulness and the Sunk-Cost Bias*, 25 PSYCHOL. SCI. 369, 369, 374 (2014).

<sup>333</sup> Adam Lueke & Bryan Gibson, *Brief Mindfulness Meditation Reduces Discrimination*, 3 PSYCHOL. CONSCIOUSNESS: THEORY, RES. & PRAC. 34, 39 (2016).

<sup>334</sup> Ulrich Kirk et al., *Interoception Drives Increased Rational Decision-Making in Meditators Playing the Ultimatum Game*, 5 FRONTIERS NEUROSCI. 1, 9–10 (2011).

<sup>335</sup> Greta B. Raglan & Jay Schulkin, *Decision-making, Mindfulness, and Mood: How Mindfulness Techniques Can Reduce the Impact of Biases and Heuristics Through Improved Decision-making and Positive Affect*, 4 J. DEPRESSION & ANXIETY 168, 172–73 (2014).

<sup>336</sup> PIER M. FORNI, *THE THINKING LIFE: HOW TO THRIVE IN THE AGE OF DISTRACTION* 87 (2011).

and Payne introduce a concept of decision readiness,<sup>337</sup> in which a person's System Two thinking<sup>338</sup> is ready to monitor a person's System One thinking,<sup>339</sup> interrupt wrong judgments, and avoid wrong decisions. Being mindful facilitates decision readiness.<sup>340</sup>

A 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.<sup>341</sup> Another way that mindfulness meditation can improve decision-making is if mindfulness meditation reduces anxiety and stress<sup>342</sup> because there is evidence that "anxiety increases threat perception, which, in turn, results in self-interested unethical behaviors."<sup>343</sup> 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,<sup>344</sup> perhaps as the result of reducing self-reported anxiety and fatigue.<sup>345</sup> 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 notes.<sup>346</sup>

Professors Natalia Karelaia and Jochen Reb analyze how and when mindfulness can improve people's decision-making.<sup>347</sup> They divided up the process of decision-making into these four stages<sup>348</sup>:

---

<sup>337</sup> Soll et al., *supra* note 131, at 929–30.

<sup>338</sup> KAHNEMAN, *supra* note 5, at 13.

<sup>339</sup> *Id.* at 13.

<sup>340</sup> *Id.* at 930; Raglan & Schulkin, *supra* note 335, at 172–73.

<sup>341</sup> Fadel Zeidan et al., *Mindfulness Meditation Improves Cognition: Evidence of Brief Mental Training*, 19 CONSCIOUSNESS & COGNITION 597, 603–04 (2010).

<sup>342</sup> Madhav Goyal et al., *Meditation Programs for Psychological Stress and Well-being: A Systematic Review and Meta-analysis*, 174 J. AM. MED. ASS'N INTERNAL MED. 357, 361, 364 (2014).

<sup>343</sup> Maryam Kouchaki & Sreedhari D. Desai, *Anxious, Threatened, and Also Unethical: How Anxiety Makes Individuals Feel Threatened and Commit Unethical Acts*, 100 J. APPLIED PSYCHOL. 360, 360 (2015).

<sup>344</sup> Zeidan et al., *supra* note 341, at 597, 602–04.

<sup>345</sup> *Id.* at 601, 603.

<sup>346</sup> Raglan & Schulkin, *supra* note 335, at 172–73; Zeidan et al., *supra* note 341, at 603–04.

<sup>347</sup> Natalia Karelaia & Jochen Reb, *Improving Decision-making through Mindfulness*, in MINDFULNESS IN ORGANIZATION: FOUNDATION, RESEARCH, AND APPLICATIONS 163, 164–65 (Jochen Reb & Paul W. B. Atkins eds., 2015).

<sup>348</sup> *Id.* at 165, fig.7.1.

(1) Decision Framing, (2) Information Gathering and Processing, (3) Making Conclusions, and (4) Learning from Feedback.

Karelaia and Reb point out how mindfulness could hamper decision-making if additional options lead to cognitive overload, delay choice, or in the limit cause choice paralysis.<sup>349</sup> The focusing of attention to the present moment that mindfulness entails may also result in prioritizing immediate as opposed to long-term goals.<sup>350</sup> A counterpoint is that practicing mindfulness helps people realize that their current thoughts, feelings, and bodily sensations are only fleeting and temporary.<sup>351</sup> This realization should lead people to appreciate that their present goals are likely to change in unpredictable ways.<sup>352</sup> Being more mindful about, empathetic with, and sensitive to people's future selves may also help people choose wisely regarding their future selves.<sup>353</sup>

Being mindful can also help people discern the difference between important and necessary versus unimportant and unnecessary decisions.<sup>354</sup> 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 micromanaging their lives.<sup>355</sup> Judiciously focusing on choices that matter also lowers the anxiety from being overwhelmed by having to make too many choices.<sup>356</sup>

Mindfulness can help people realize when they should choose to stop continuing a plan of action.<sup>357</sup> A correlational and three experimental studies<sup>358</sup> found that increased mindfulness meditation reduces irrational escalation of commitment by reducing the related sunk-cost bias,<sup>359</sup> in which people continue a course of

<sup>349</sup> *Id.* at 168.

<sup>350</sup> *Id.*

<sup>351</sup> *Id.* at 178.

<sup>352</sup> *Id.* at 175.

<sup>353</sup> *Id.* at 175.

<sup>354</sup> *Id.* at 168–69.

<sup>355</sup> *Id.* at 169.

<sup>356</sup> *Id.*

<sup>357</sup> *Id.* at 170.

<sup>358</sup> Hafenbrack et al., *supra* note 332, at 370–74 (presenting these studies).

<sup>359</sup> Hal R. Arkes & Catherine Blumer, *The Psychology of Sunk Cost*, 35 *ORG. BEHAV. & HUM. DECISION PROCESSES* 124, 124 (1985) (presenting a field study and questionnaire studies finding the sunk-cost effect); Hafenbrack et al., *supra* note 332, at 374.

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.<sup>360</sup> Karelaia and Reb believe that another reason that mindfulness reduces irrational escalation of commitment is that mindfulness reduces ego involvement and personal attachment to past choices and uncomfortable feelings that result from criticism of past choices.<sup>361</sup>

Economics Nobel laureate Herbert Simon<sup>362</sup> 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.<sup>363</sup>

Mindfulness may result in less extensive information search because mindfulness itself entails heightened utilization of the limited cognitive resource of attention.<sup>364</sup> 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.<sup>365</sup>

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

---

<sup>360</sup> Terrance Odean, *Are Investors Reluctant to Realize Their Losses?*, 53 J. FIN. 1775, 1777–78 (1998) (providing empirical evidence that investors hold losing investments too long).

<sup>361</sup> Karelaia & Reb, *supra* note 347, at 170.

<sup>362</sup> *Herbert A. Simon Facts*, NOBEL PRIZE, <https://www.nobelprize.org/prizes/economics/1978/simon/facts/> [<https://perma.cc/LU2L-D73K>]; *Nobel Laureates and Research Affiliations*, NOBEL PRIZE, <https://www.nobelprize.org/prizes/lists/nobel-laureates-and-research-affiliations/> [<https://perma.cc/D93K-7XX9>].

<sup>363</sup> Herbert A. Simon, *Designing Organizations for an Information-Rich World*, in *COMPUTERS, COMMUNICATIONS, AND THE PUBLIC INTEREST* 40–41 (Martin Greenberger ed., 1971).

<sup>364</sup> Karelaia & Reb, *supra* note 347, at 172.

<sup>365</sup> *Id.*

thoughts.<sup>366</sup> 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.<sup>367</sup> Mindfulness can lead people to realize if they engage in excessive information search and redirect their efforts more productively elsewhere.<sup>368</sup> Mindfulness can reduce illusory pattern detection, which is particularly likely when people feel a lack of control.<sup>369</sup> Mindfulness practice can mitigate many of the difficulties of learning from experience that this Article detailed earlier,<sup>370</sup> if Karelaia and Reb are correct that “mindful decision makers are more likely to *learn from feedback* and importantly, learn the right lessons.”<sup>371</sup>

Mindfulness can lead to compassion and self-compassion.<sup>372</sup> Leah Weiss teaches a course at the Stanford University Graduate School of Business titled *Leading with Mindfulness and Compassion*.<sup>373</sup> The course “is based on the theory that a compassionate attitude can significantly reduce the distress people feel in difficult situations, as well as make you a better leader.”<sup>374</sup> Compassionate business leaders can change toxic work environments.<sup>375</sup> There is recent evidence that self-compassion improves problem-solving, resilience after failure, and quality of life, while it decreases anxiety, depression, and stress.<sup>376</sup>

Finally, and importantly for law,<sup>377</sup> practicing mindfulness can lead to individual development and societal reform.<sup>378</sup>

<sup>366</sup> *Id.* at 175.

<sup>367</sup> *Id.* at 175.

<sup>368</sup> *Id.*

<sup>369</sup> *Id.* at 175–76; Jennifer A. Whitson & Adam D. Galinsky, *Lacking Control Increases Illusory Pattern Perception*, 322 *SCI.* 115, 115 (2008) (presenting data from six experiments).

<sup>370</sup> *See supra* Section I.A.

<sup>371</sup> Karelaia & Reb, *supra* note 347, at 182.

<sup>372</sup> Huang, *supra* note 224, at 96, 97, 112, 120, 125, 129, 130.

<sup>373</sup> Melinda Sacks, *Chief Kindness Officers?* *STAN. MAG.* (Dec. 15, 2017), <https://medium.com/stanford-magazine/compassion-class-at-the-graduate-school-of-business-62fbcdb37c2c> [<http://perma.cc/9PMG-PE6M>].

<sup>374</sup> *Id.*

<sup>375</sup> *Id.*

<sup>376</sup> *Id.*

<sup>377</sup> *See, e.g.*, Angela Harris, Margareta Lin, & Jeff Selbin, *From ‘The Art of War’ to ‘Being Peace’: Mindfulness and Community Lawyering in a Neoliberal Age*, 95 *CAL. L. REV.* 2073 (2007).

<sup>378</sup> GRETCHEN KI STEIDLE, *LEADING FROM WITHIN: CONSCIOUS SOCIAL CHANGE AND MINDFULNESS FOR SOCIAL INNOVATION* (2017).

Gretchen Ki Steidle believes that personal transformation and social change are both crucial for a just society.<sup>379</sup> Steidle is the founder<sup>380</sup> and president<sup>381</sup> of Global Grassroots,<sup>382</sup> an international non-profit organization whose defining “mission is to catalyze women and girls as leaders of Conscious Social Change in their communities.”<sup>383</sup> The phrase Conscious Social Change refers to “a design methodology that employs mindfulness throughout the process of designing a social solution.”<sup>384</sup> Conscious Social Change<sup>385</sup> consists of these five capacities and associated guiding questions<sup>386</sup>:

- 1) Cultivating Presence: What is happening?<sup>387</sup>
- 2) Becoming Whole: What is True?<sup>388</sup>
- 3) Ensuring Well-Being: What is needed?<sup>389</sup>
- 4) Engaging Mindfully: What is helpful?<sup>390</sup>
- 5) Leading from Within: What is possible?<sup>391</sup>

Steidle reviews the neuroscience and psychotherapeutic evidence demonstrating the benefits of mindfulness.<sup>392</sup> Steidle details how mindfulness helps people to become better change agents and leaders, who are able to create more sustainable solutions, forge stronger relationships, and inspire change in others.<sup>393</sup> Steidle

<sup>379</sup> *Id.*

<sup>380</sup> *Our Founder*, GLOBAL GRASSROOTS NETWORK, <http://www.globalgrassroots.org/founder.html> [<https://perma.cc/8GSE-N4SC>].

<sup>381</sup> *Board of Directors*, GLOBAL GRASSROOTS NETWORK, <http://www.globalgrassroots.org/board.html> [<https://perma.cc/9ZDY-JT5F>].

<sup>382</sup> *Who We Are*, GLOBAL GRASSROOTS NETWORK, [http://www.globalgrassroots.org/who\\_we\\_are.html](http://www.globalgrassroots.org/who_we_are.html) [<https://perma.cc/VU83-4CEE>].

<sup>383</sup> *Mission and Vision*, GLOBAL GRASSROOTS NETWORK, [http://www.globalgrassroots.org/mission\\_vision.html](http://www.globalgrassroots.org/mission_vision.html) [<https://perma.cc/ZW4V-QCBL>].

<sup>384</sup> *Id.*; STEIDLE, *supra* note 378, at 37–44.

<sup>385</sup> SOCIAL CONSCIOUS CHANGE, <http://www.conscioussocialchange.org/> [<https://perma.cc/RX7K-H4CH>].

<sup>386</sup> STEIDLE, *supra* note 378, at xx, 40.

<sup>387</sup> *Id.* at 45–63.

<sup>388</sup> *Id.* at 65–109.

<sup>389</sup> *Id.* at 111–34.

<sup>390</sup> *Id.* at 135–92.

<sup>391</sup> *Id.* at 193–203.

<sup>392</sup> *Id.* at 1–35.

<sup>393</sup> *Mindfulness: Why Being Present Can Make You a Better Manager*, KNOWLEDGE@WHARTON (Feb. 5, 2018), <http://knowledge.wharton.upenn.edu/ar>

lists and describes organizations that integrate mindfulness into social change.<sup>394</sup> Steidle presents mindfulness practices for individuals and groups.<sup>395</sup>

### III. THINKING BOOSTS

This part of the Article analyzes structured ways to think better and more systematically by utilizing thinking tools that people may be unfamiliar with, namely thinking architecture and thinking technologies.<sup>396</sup> Pen, paper, stylus, and tablet are familiar thinking tools.<sup>397</sup> As a humorous television commercial states, though: “[t]he wrong tools can only take you so far.”<sup>398</sup> There should be less resistance towards efforts at increasing people’s thinking because few people should claim that they are just not thinking people.<sup>399</sup> In the movie, *Bridge of Spies*,<sup>400</sup> a character says: “Sometimes people think wrong. People are people.” Shlomo Benartzi and John Payne introduce the phrase “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.”<sup>401</sup> Thinking architecture differs from traditional checklists<sup>402</sup> as each step in thinking architecture “is designed to deal with a particular behavioral challenge or mental blind spot ... to fortify the weakest

---

title/mindfulness-how-being-present-can-make-you-a-better-manager/ [https://perma.cc/NHJ3-3CN6].

<sup>394</sup> STEIDLE, *supra* note 378, at 209–13.

<sup>395</sup> *Id.* at xv–xvi, 7, 30–35, 57–63, 174–92, 202–03.

<sup>396</sup> Keith Oatley & Maja Djikic, *Writing as Thinking*, 12 REV. OF GEN. PSYCHOL. 9, 9–10, 12 (2008).

<sup>397</sup> *Id.*

<sup>398</sup> Blake Ebel, *PowerShares QQQ “Uphill battle”*, YOUTUBE (Nov. 26, 2014), <https://www.youtube.com/watch?v=iyrl26nztKI> [http://perma.cc/ZUX2-SSBD].

<sup>399</sup> *Id.*

<sup>400</sup> *Bridge Of Spies* (Amblin Entertainment 2015).

<sup>401</sup> SHLOMO BENARTZI WITH ROGER LEWIN, THINKING SMARTER: SEVEN STEPS TO YOUR FULFILLING RETIREMENT ... AND LIFE 5 (2015); *see also* BENARTZI WITH LEHRER, *supra* note 57, at 197–98.

<sup>402</sup> KAHNEMAN, *supra* note 5, at 226–27 (explaining the virtues of simple algorithms and checklists). *See generally* ATUL GAWANDE, THE CHECKLIST MANIFESTO: HOW TO GET THINGS RIGHT (2011) (extolling on the virtues of checklists).

parts of the mind.”<sup>403</sup> In a sense, thinking architecture is a low technology version of thinking technology.<sup>404</sup>

There is experimental evidence that even a twenty-five-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.<sup>405</sup> 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,<sup>406</sup> whether the performance of group members can be predicted from the performance of one of its members,<sup>407</sup> choosing which of two colleges to attend,<sup>408</sup> hiring an actress for the lead in a Broadway play,<sup>409</sup> how to determine if you like Chinese food,<sup>410</sup> and how to figure out if you like vacations.<sup>411</sup>

#### A. *Thinking Technologies*

This part of the Article considers various engaging and fun technologies that can help people think better and in so doing improve their decision-making. 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.<sup>412</sup> 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

---

<sup>403</sup> BENARTZI WITH LEWIN, *supra* note 401, at 5.

<sup>404</sup> *Id.*

<sup>405</sup> 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).

<sup>406</sup> *Id.* at 285–88.

<sup>407</sup> *Id.* at 286.

<sup>408</sup> *Id.* at 287.

<sup>409</sup> *Id.* at 288.

<sup>410</sup> *Id.*

<sup>411</sup> *Id.* at 288–89.

<sup>412</sup> JIM BLASCOVICH & JEREMY N. BALENSON, INFINITE REALITY (2011); INFINITE REALITY, <http://www.infinitereality.org/research.html> [<http://perma.cc/467M-M5BD>].

year.”<sup>413</sup> Regulators could mandate that fast food restaurants provide a hologram projection of what a customer might look like as they age if they regularly ate healthy versus unhealthy items.<sup>414</sup>

Experimental studies have found evidence of a phenomenon 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.<sup>415</sup> 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.<sup>416</sup> In another study, those assigned taller avatars behaved more confidently in negotiating than others assigned shorter avatars.<sup>417</sup> The effects in these studies have been found to extend to an actual online community and subsequent face-to-face interactions.<sup>418</sup>

Serious games are games that “have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement.”<sup>419</sup> Simulation games should be more effective than alternative instructional methods according to interactive cognitive complexity theory because simulation games engage people’s cognitive and affective processes simultaneously.<sup>420</sup> A meta-analysis examining data on 6,476 individuals in 65 studies finds people trained by computer-based simulation games had 20 percent more self-efficacy, 14 percent more skill-based knowledge

---

<sup>413</sup> Colin F. Camerer, *Wanting, Liking, and Learning: Neuroscience and Paternalism*, 73 U. CHI. L. REV. 87, 103 (2006).

<sup>414</sup> *Id.*

<sup>415</sup> Nick Yee & Jeremy Bailenson, *The Proteus Effect: The Effect of Transformed Self-Representation on Behavior*, 33 HUMAN COMM. RES. 271, 271, 285 (2007).

<sup>416</sup> *Id.*

<sup>417</sup> *Id.*

<sup>418</sup> Nick Yee et al., *The Proteus Effect: Implications of Transformed Digital Self-Representation On Online and Offline Behavior*, 36 COMM. RES. 285, 285 (2009).

<sup>419</sup> CLARK C. ABT, *SERIOUS GAMES* 9 (1975); see also DAVID MICHAEL & SANDE CHEN, *SERIOUS GAMES: GAMES THAT EDUCATE, TRAIN, AND INFORM* (2006); *PSYCHOLOGY, PEDAGOGY, AND ASSESSMENT IN SERIOUS GAMES* (Thomas M. Connolly et al. eds., 2014).

<sup>420</sup> Robert D. Tennyson & Robert L. Jorczak, *A Conceptual Framework for the Empirical Study of Games*, in *COMPUTER GAMES AND TEAM AND INDIVIDUAL LEARNING* 3 (2008).

level, 11 percent more factual knowledge level, and 9 percent higher retention rate than people in control groups.<sup>421</sup>

Some professions have begun to explore the use of serious games to teach contextualized decision-making skills. 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 ward.”<sup>422</sup> *JDoc* provides an engaging way for junior doctors to learn communication skills, decision-making skills, diagnostic and medical procedures, interpersonal skills, and medical information.<sup>423</sup> Another virtual environment serious game,<sup>424</sup> *DREAD-ED* (Disaster Readiness through Education), is a cooperative multiplayer game designed to teach communication and group decision-making skills to emergency management personnel.<sup>425</sup> A company called Knack<sup>426</sup> develops app-based video games that provide various measures of a player’s character, decision-making, emotional/social intelligence, leadership, mindset, and thinking.<sup>427</sup> Human resources departments can utilize such information to avoid cognitive biases in their hiring processes.<sup>428</sup> People can utilize such information to increase their self-awareness and choose professions that fit their strengths.<sup>429</sup>

Serious games can train players to recognize and mitigate cognitive biases in decision-making.<sup>430</sup> A video adventure game

---

<sup>421</sup> Traci Sitzmann, *A Meta-Analytic Examination of The Instructional Effectiveness of Computer-Based Simulation Games*, 64 PERSONNEL PSYCHOL. 489 (2011).

<sup>422</sup> Aidan Sliney & David Murphy, *JDoc: A Serious Game for Medical Learning*, PROC. FIRST INT’L CONF. ADVANCES COMPUTER-HUM. INTERACTION 131, 131 (2008).

<sup>423</sup> *Id.* at 132.

<sup>424</sup> Nina Haferkamp et al., *Training Disaster Communication By Means of Serious Games In Virtual Environments*, 2 ENT. COMPUTING 81, 81 (2011).

<sup>425</sup> *Id.*

<sup>426</sup> *Knack Story*, KNACK, <https://www.knack.it/story/> [<http://perma.cc/N95C-Q8B4>].

<sup>427</sup> *Knack Mission*, KNACK, <https://www.knack.it/mission/> [<https://perma.cc/72B6-RW2L>].

<sup>428</sup> Keith Fiveson, *It Takes EQ, Not Just IQ*, HR EXCH. NETWORK (Jan. 4, 2010), <https://www.hrexchangenetwork.com/hr-talent-management/articles/it-takes-eq-not-just-iq> [<http://perma.cc/9BFS-FUB2>].

<sup>429</sup> *Id.*

<sup>430</sup> Benjamin A. Clegg et al., *Gaming Technology for Critical Thinking: Engagement, Usability, and Measurement*, 58 PROC. HUM. FACTORS & ERGONOMICS SOC. ANN. MEETING 2370, 2370 (2014); Flach et al., *supra* note 163, at 272.

called *Missing: The Pursuit of Terry Hughes*<sup>431</sup> incorporates an engaging storyline about Terry, “a gregarious, well-liked figure with an extravagant social life”<sup>432</sup> 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.<sup>433</sup> 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.<sup>434</sup>

It should be unsurprising that learning to recognize and mitigate cognitive biases are crucial skills for intelligence analysts.<sup>435</sup> Players of this game achieved statistically significant immediate increases in their knowledge about cognitive biases, by 37 percent for students and 44 percent for analysts.<sup>436</sup> The immediate bias mitigation effects were improvements of 25 percent for students and 27 percent for analysts.<sup>437</sup> Of the players who completed follow-up testing after eight weeks, cognitive bias knowledge retention decreased from 37 percent to 25 percent among students and from 39 percent to 26 percent among analysts, while bias mitigation decreased from 29 percent to 28 percent among students and from 27 percent to 20 percent among analysts.<sup>438</sup>

---

<sup>431</sup> Carl Symborski et al., *Missing: A Serious Game for the Mitigation of Cognitive Biases*, 1, 1, PROC. INTERSERVICE/INDUSTRY TRAINING, SIMULATION, & EDUC. CONF. (2014), <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.682.9522>; see also Carl Symborski, *Leidos Sirius Missing*, 34–45, <http://www.gametechnology.com/sites/default/files/Rita%20Bush%20Sirius%20Game%20Tech%20presentation%2020140819%20%28all%20panelist%20slides,final%209.pdf> [<https://perma.cc/X69T-XNWB>].

<sup>432</sup> Symborski et al., *supra* note 431, at 5.

<sup>433</sup> *Id.*

<sup>434</sup> *Id.*

<sup>435</sup> RICHARDS J. HEUER JR., *PSYCHOLOGY OF INTELLIGENCE ANALYSIS*, 112–13 (2007).

<sup>436</sup> Symborski et al., *supra* note 431, at 10.

<sup>437</sup> *Id.*

<sup>438</sup> *Id.* at 10–11.

A different version of the game, *Missing: The Final Secret*,<sup>439</sup> taught players about recognizing and mitigating these other cognitive biases: anchoring bias (“overweighting the first information primed or considered in subsequent judgment”<sup>440</sup>), social projection bias (“assuming others’ emotions, thoughts, and values are similar to one’s own”<sup>441</sup>), and representativeness bias (“using the similarity of an outcome to a prototypical outcome to judge its probability”<sup>442</sup>).

Players of this version “exonerate their employer of a criminal charge and uncover the criminal activity of her accusers.”<sup>443</sup> Players of this game experienced immediate medium to large debiasing effects that persisted at least two months later and 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.”<sup>444</sup>

Recent research with an experimental empathy training video game, *Crystals of Kaydor*, found that adolescents who played daily for two weeks had increased connectivity in their brain networks that are linked to empathy and perspective, with some displaying altered neural networks related to emotion regulation.<sup>445</sup>

University of Denver computer science professor and chair, Scott Leutenegger,<sup>446</sup> and University of Denver electronic media art & design and digital media studies professor Rafael Fajardo<sup>447</sup>

---

<sup>439</sup> Carey K. Morewedge et al., *Debiasing Decisions: Improved Decision-making with a Single Training Intervention*, 2 POL’Y INSIGHTS. & BRAIN SCI. 129, 134 (2015).

<sup>440</sup> *Id.* at 132.

<sup>441</sup> *Id.*

<sup>442</sup> *Id.*

<sup>443</sup> *Id.* at 137.

<sup>444</sup> *Id.*

<sup>445</sup> Tammi R. A. Kral et al., *Neural Correlates of Video Game Empathy Training in Adolescents: A Randomized Trial*, 13 NPJ SCI. LEARNING 1, 3–7 (2018); *Video Game Can Change the Brain, May Improve Empathy in Middle School Children*, CTR. FOR HEALTHY MINDS (Aug. 7, 2018), [https://centerhealthyminds.org/news/video-game-changes-the-brain-and-may-improve-empathy-in-middle-school-children?utm\\_source=Center+for+Healthy+Minds&utm\\_campaign=c124d11a15-EMAIL\\_CAMPAIGN\\_2018\\_03\\_27\\_COPY\\_01&utm\\_medium=email&utm\\_term=0\\_cce2315563-c124d11a15-9218095](https://centerhealthyminds.org/news/video-game-changes-the-brain-and-may-improve-empathy-in-middle-school-children?utm_source=Center+for+Healthy+Minds&utm_campaign=c124d11a15-EMAIL_CAMPAIGN_2018_03_27_COPY_01&utm_medium=email&utm_term=0_cce2315563-c124d11a15-9218095) [https://perma.cc/5TRN-XU6N].

<sup>446</sup> *Scott T. Leutenegger Biography*, U. DENV. FACULTY WEBPAGE, <http://www.cs.du.edu/~leut/> [http://perma.cc/V2XF-F9XE].

<sup>447</sup> FACULTY WEBPAGE, <http://www.rafaelfajardo.com/> [http://perma.cc/U3WZ-G4NC].

coined the phrase “humane games” to encompass (1) games for change, (2) games for health, and (3) games for education.<sup>448</sup> Two examples of humane games simulate opposing cultural realities and perspectives at the United States–Mexico border, specifically at El Paso–Ciudad Juarez: in *Crosser*<sup>TM</sup>,<sup>449</sup> reminiscent of the arcade classic *Frogger*<sup>TM</sup>, a player attempts to illegally cross the river/border and in *La Migra*<sup>TM</sup>,<sup>450</sup> inspired by the arcade classic *Space Invaders*<sup>TM</sup>, a player is a border patrol agent of the United States Immigration and Naturalization Service who attempts to prevent illegal entry. These socially conscious games exemplify video games as “vehicles and venues for cultural commentary and criticism.”<sup>451</sup> Other humane games concern blame shifting back and forth between political parties,<sup>452</sup> rescuing civilians,<sup>453</sup> decimation of numbats in Australia due to the invasive species, the European Red Fox,<sup>454</sup> and the 2009 recession.<sup>455</sup>

Professors Sara Konrath, Brad Bushman, Rich Tolman, and Matthew Winslow utilized evidence-based techniques in creating the Random App of Kindness (RAKi) to increase the development of empathic habits in teenagers (ages ten to seventeen).<sup>456</sup> RAKi is a collection of nine smartphone mini-games.<sup>457</sup> Initially, three

---

<sup>448</sup> HUMANE GAMES, <http://humanegames.tumblr.com/> [<http://perma.cc/YG5N-Q67G>].

<sup>449</sup> *Crosser*, RAFAEL FAJARDO, <http://www.rafaelfajardo.com/projects/crosser.html> [<http://perma.cc/3YUJ-6SNX>].

<sup>450</sup> *La Migra*, RAFAEL FAJARDO, <http://www.rafaelfajardo.com/projects/migra.html> [<http://perma.cc/96MP-7DXR>].

<sup>451</sup> Rafael Fajardo, *Pixels, Politics and Play: Digital Video Games As Social Commentary*, 3 INTELLIGENT AGENT MAG. (Summer/Fall 2003), [http://www.intelligentagent.com/archive/Vol3\\_No2\\_gaming\\_fajardo.html](http://www.intelligentagent.com/archive/Vol3_No2_gaming_fajardo.html) [<https://perma.cc/3U26-LX7H>].

<sup>452</sup> Esanche2, *Pass the Blame*, SCRATCH (Apr. 14, 2009), <https://scratch.mit.edu/projects/488451/> [<http://perma.cc/3M8K-MSJ5>].

<sup>453</sup> Tfushimi, *Iraq rescue*, SCRATCH (Apr. 13, 2009), <https://scratch.mit.edu/projects/487383/> [<http://perma.cc/WCB2-84YR>].

<sup>454</sup> Redokapi, *Foxes and Numbats*, SCRATCH, <https://scratch.mit.edu/projects/487551/> [<http://perma.cc/3XKS-4RBW>].

<sup>455</sup> QusaTalma, *Gauntlet Recessions*, SCRATCH, <https://scratch.mit.edu/projects/487445/> [<http://perma.cc/YB9Z-QYVK>].

<sup>456</sup> Sara Konrath, *Random App of Kindness*, <http://www.rakigame.com/#home/> [<https://perma.cc/LX8S-MXFN>].

<sup>457</sup> *Id.*

games are available to a player: *Match the Emotion* teaches a player to improve recognition of emotions in other people's faces by matching eyes, noses, and mouths on cartoon faces to specific emotions.<sup>458</sup> *Water the Venus Fly Trap* teaches a player to inhibit a dominant response by instructing a player to water an animated plant as quickly as possible and stop as quickly as possible upon being prompted to not water that plant.<sup>459</sup> *Stop the Baby from Crying* teaches a player empathy by figuring out what a crying baby needs and giving it to the baby.<sup>460</sup> Upon completing a mini-game successfully three times, another mini-game is unlocked.<sup>461</sup> *Help the Old Woman across the Street* teaches a player the cognitive form of empathy of role or perspective taking by presenting the visual point of view of an old woman crossing a street.<sup>462</sup> Upon completing another mini-game successfully three times, another mini-game is unlocked.<sup>463</sup> *Dance!* teaches a player to develop pro-sociality by dancing in sync with a character.<sup>464</sup> Upon completing a third mini-game successfully three times, another mini-game is unlocked.<sup>465</sup> *Pet the Dog* teaches a player empathy by gently stroking a dog and cleaning her fur to transform her from being sad to happy.<sup>466</sup> Upon completing a fourth mini-game successfully three times, another mini-game is unlocked.<sup>467</sup> *Tracing Expressions* teaches a player empathy by tracing a character's facial expressions.<sup>468</sup> Upon completing a fifth mini-game successfully three times, another mini-game is unlocked.<sup>469</sup> *Angry Man* teaches a player anger management and impulse control by calmly walking away quickly from an angry man yelling unintelligibly.<sup>470</sup> A bonus

---

<sup>458</sup> *Id.*

<sup>459</sup> *Id.*

<sup>460</sup> *Id.*

<sup>461</sup> Amanda Bindel, *Random App of Kindness Review*, COMMON SENSE MEDIA, <https://www.commonsensemedia.org/app-reviews/random-app-of-kindness> [<https://perma.cc/4ZTJ-UAB8>].

<sup>462</sup> *Id.*

<sup>463</sup> Bindel, *supra* note 461.

<sup>464</sup> *Id.*

<sup>465</sup> *Id.*

<sup>466</sup> *Id.*

<sup>467</sup> *Id.*

<sup>468</sup> *Id.*

<sup>469</sup> *Id.*

<sup>470</sup> *Id.*

game *Balloons* has a player choose between being more prosocial or more self-focused.<sup>471</sup> Preliminary data analyses found teens randomly assigned to play RAKi for two months displayed empathic emotional responses to someone in distress and had less aggressive beliefs and behaviors compared with teens who played a control game for two months.<sup>472</sup> Boys who played RAKi were more than three times more likely to help someone in distress than those who did not.<sup>473</sup> Most girls were, independent of playing RAKi, already willing to help.<sup>474</sup>

Because serious games and humane games are games, they can harness and leverage people's desire to play and effectively reframe learning from being an onerous chore to a fun, enjoyable experience.<sup>475</sup> A similar phenomenon occurs when people are motivated to engage in aerobic exercise by playing video games that involve people moving and becoming physically active.<sup>476</sup>

### *B. Diversity*

Much of the discussion about diversity focuses on identity diversity, that is differences in people's cultural identities, demographic attributes, ethnicities, expertise, geographic locations and/or origins, occupations, race, religion, sexual orientation, physical abilities, socioeconomic status, and training.<sup>477</sup> Identity diversity is correlated with another notion of diversity, namely cognitive diversity, which refers to differences in how people think about and process problems.<sup>478</sup> Cognitive diversity<sup>479</sup> consists of differences in cognitive repertoires,<sup>480</sup> which consist of these five components: information<sup>481</sup> (e.g., data, facts), knowledge<sup>482</sup> (e.g., understanding,

---

<sup>471</sup> *Id.*

<sup>472</sup> *Id.*

<sup>473</sup> *Id.*

<sup>474</sup> *Id.*

<sup>475</sup> See MICHAEL & CHEN, *supra* note 419, at 21.

<sup>476</sup> Huang, *supra* note 95, at 314, n. 397.

<sup>477</sup> SCOTT E. PAGE, THE DIVERSITY BONUS: HOW GREAT TEAMS PAY OFF IN THE KNOWLEDGE ECONOMY 54 (2017).

<sup>478</sup> See *id.*

<sup>479</sup> See PAGE, *supra* note 58, at 314.

<sup>480</sup> PAGE, *supra* note 477, at 52–67.

<sup>481</sup> *Id.* at 56–57.

<sup>482</sup> *Id.* at 57–58.

structure), heuristics or algorithms<sup>483</sup> (e.g., differential diagnosis, recipes), representations,<sup>484</sup> which consist of perspectives<sup>485</sup> (e.g., alphabetical order or chronological order) and categorizations<sup>486</sup> (e.g., west coast, east coast, midwestern, and southern), and mental models (e.g., econometric models, weather forecasting). Fostering cognitive diversity encourages cross-learning and group synergies.<sup>487</sup> Identity diversity is correlated with, and can improve organizational thinking through, cognitive diversity. For example, cultural experimental psychological research finds differences in the cognition, perception, reasoning, and thinking of East Asian cultures compared to western cultures.<sup>488</sup>

Research in complex systems, economics, and political science reveals that diversity can play a myriad of roles in organizations and societies, including providing benefits, such as improved productivity, and creating costs, such as potential miscommunication.<sup>489</sup> Much of this research is the work of Scott Page, the Leonid Hurwicz Collegiate Professor of Complex Systems, Political Science, and Economics at the University of Michigan, Ann Arbor.<sup>490</sup> Page and economist Lu Hong prove several theorems providing conditions under which cognitive diversity improves upon individual ability.<sup>491</sup> In nontechnical language, the diversity prediction theorem implies the prediction of a group of people has to be always at least as good as the average prediction of the group's members.<sup>492</sup> How much better a group's prediction is than

---

<sup>483</sup> *Id.* at 58–59.

<sup>484</sup> *Id.* at 59–63.

<sup>485</sup> *Id.* at 60–62.

<sup>486</sup> PAGE, *supra* note 477, at 62–63.

<sup>487</sup> *See* PAGE, *supra* note 58, at 327, 335.

<sup>488</sup> *See* RICHARD E. NISBETT, *THE GEOGRAPHY OF THOUGHT: HOW ASIANS AND WESTERNERS THINK DIFFERENTLY ... AND WHY* xx–xxi (2004) (describing psychological research experiments about cultural differences in cognition). *But see* PAGE, *supra* note 477, at 145–48 (cautioning that members of any identity category vary in their cognitive repertoires).

<sup>489</sup> *See generally* PAGE, *supra* note 58 (providing a pragmatic defense of diversity practices).

<sup>490</sup> *Scott E. Page Faculty Website*, U. MICH., <https://sites.lsa.umich.edu/scottepage/> [<https://perma.cc/JTW5-ETQG>].

<sup>491</sup> Lu Hong & Scott E. Page, *Groups of Diverse Problem Solvers Can Outperform Groups of High-Ability Problem Solvers*, 101 *PROC. NAT'L ACAD. SCI.* 16385, 16389 (2004) (providing details of this research).

<sup>492</sup> PAGE, *supra* note 477, at 247–49.

the average prediction depends on how much cognitive diversity that group has.<sup>493</sup> A group just as bad at predicting as its average member must not have any cognitive diversity.<sup>494</sup> A group much better at predicting than its average member must have a large degree of cognitive diversity.<sup>495</sup> Cognitive diversity offers a counter to groupthink.<sup>496</sup>

Page demonstrates how cognitive diversity offers everyone the benefits of improved creativity, decision-making, innovation, prediction, problem-solving, and productivity.<sup>497</sup> Page details precisely how and why organizations and societies can benefit from cognitive diversity.<sup>498</sup> Page develops policy implications about how organizations can improve their admissions, appointment, and hiring decisions.<sup>499</sup> In doing so, Page “moves us way beyond accepting diversity as a matter of taste”<sup>500</sup> to “help establish ‘a science of difference.’”<sup>501</sup> Page’s more recent, less mathematical, and more approachable book<sup>502</sup> presents empirical evidence of,<sup>503</sup> and the business case for,<sup>504</sup> diversity bonuses that result from more accurate predictions, more effective problem solving, increased creativity, better verification of truth, improved strategizing, and deeper and broader evaluations.<sup>505</sup>

---

<sup>493</sup> *Id.*

<sup>494</sup> *Id.*

<sup>495</sup> *Id.*

<sup>496</sup> *Id.*

<sup>497</sup> DardenMBA, *Scott Page on Leveraging Diversity, Address at the University of Virginia Darden School of Business*, YOUTUBE (Feb. 4, 2010), <http://www.youtube.com/watch?v=lt9UeknKwZw>; see Claudia Dreifus, *In Professor’s Model, Diversity = Productivity*, N.Y. TIMES (Jan. 8, 2008), <http://www.nytimes.com/2008/01/08/science/08conv.html> (interviewing Page and reporting on this research).

<sup>498</sup> PAGE, *supra* note 58, at 313–35.

<sup>499</sup> *Id.* at 352–70.

<sup>500</sup> Yannis M. Ioannides, *A Review of Scott E. Page’s The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies*, 48 J. ECON. LIT. 108, 120 (2010).

<sup>501</sup> *Id.* at 121.

<sup>502</sup> PAGE, *supra* note 477.

<sup>503</sup> *Id.* at 162–83.

<sup>504</sup> *Id.* at 184–208.

<sup>505</sup> LinkedIn Editors, *Diversity Creates Bonuses. It’s Not Just a Nice Thing To Do*, YOUTUBE (Sept. 20, 2017), <https://www.youtube.com/watch?v=FKCYtzkDEXw>; The Andrew W. Mellon Foundation, *The Diversity Bonus*, YOUTUBE (Sept. 29, 2017), <https://www.youtube.com/watch?v=gvKXtOK6Gyw>.

Diversity bonuses are less likely for manual tasks and routine cognitive tasks.<sup>506</sup> Diversity bonuses are more likely when tasks are cognitive and non-routine.<sup>507</sup> Thus, knowledge economy tasks that are complex, high-dimensional, and indecomposable into simpler components, are very likely to have large diversity bonuses.<sup>508</sup> In her commentary about diversity bonuses, Columbia Business School Paul Calello Professor of Leadership and Ethics Katherine W. Phillips points out how the mere presence of identity diversity can produce diversity bonuses in three additional ways rather than directly through cognitive diversity.<sup>509</sup> First, seeing identity diversity facilitates the consideration and expression of cognitive diversity.<sup>510</sup> Second, identity diversity can reduce conformity with others of the same identity and in doing so result in everybody voicing unique perspectives more confidently.<sup>511</sup> Third, a desire to maintain social ties with similar identity individuals can increase discussion of differing opinions, information, and knowledge.<sup>512</sup>

Research in psychology and neuroscience shows how the social dynamics and forces of competition, cooperation, and power

---

<sup>506</sup> PAGE, *supra* note 477, at 41, fig. 1.12, 42–46.

<sup>507</sup> *Id.* at 46–48.

<sup>508</sup> *Id.* at 46.

<sup>509</sup> *Id.* at 230–36.

<sup>510</sup> *Id.* at 230–34; Katherine W. Phillips & Denise Lewin Loyd, *When Surface and Deep-Level Diversity Collide: The Effects on Dissenting Group Members*, 999 *ORG. BEHAV. & HUM. DECISION PROCESSES* 143, 158 (2006); Samuel R. Sommers, *On Racial Diversity and Group Decision-Making: Identifying Multiple Effects of Racial Diversity on Jury Deliberations*, 90 *J. PERSONALITY & SOC. PSYCHOL.* 597, 597 (2006).

<sup>511</sup> PAGE, *supra* note 477, at 234–35; Vernon L. Allen & David A. Wilder, *Categorization, Belief Similarity, and Intergroup Discrimination*, 32 *J. PERSONALITY & SOC. PSYCHOL.* 971, 971 (1975); Vernon L. Allen & David A. Wilder, *Group Categorization and Attribution of Belief Similarity*, 10 *SMALL GROUP BEHAV.* 73, 73 (1979); Rolf Holtz & Norman Miller, *Assumed Similarity and Opinion Certainty*, 48 *J. PERSONALITY & SOC. PSYCHOL.* 890, 890 (1985); Katherine W. Phillips, *The Effects of Categorically Based Expectations on Minority Influence: The Importance of Congruence*, 29 *PERSONALITY & SOC. PSYCHOL. BULL.* 3, 3 (2003).

<sup>512</sup> PAGE, *supra* note 477, at 234–35; Katherine W. Phillips, Katie A. Liljenquist & Margaret A. Neale, *Is the Pain Worth the Gain? The Advantages and Liabilities of Agreeing with Socially Distinct Newcomers*, 35 *PERSONALITY & SOC. PSYCHOL. BULL.* 336, 336 (2009).

can exacerbate or inhibit discrimination, prejudice, and stereotyping.<sup>513</sup> Much of this research is due to Susan Fiske, the Eugene Higgins Professor of Psychology at Princeton University.<sup>514</sup> It is cognitively less demanding for people to categorize other people particularly by such observable attributes as age, gender, and race than it is for people to learn about other people as individuals because such learning requires motivation.<sup>515</sup> Fiske shows that being members of a team or depending upon another person motivates people to go past stereotyping.<sup>516</sup> Positive psychology suggests how to design legal policies that promote identity diversity,<sup>517</sup> including how courts can facilitate the design of employer antidiscrimination programs to have greater effectiveness.<sup>518</sup> Research in behavioral economics, communication studies, diffusion studies, network systems, social marketing, and psychology can inform the design of policies that increase identity diversity.<sup>519</sup>

#### CONCLUSION

This Article analyzes three policies to improve people's decision-making: doing nothing, nudging, and boosting. This Article focused on three boosts: mindfulness, thinking technologies, and diversity. This Article advocates that societies facilitate the practice of mindfulness to improve people's decision-making competencies. This Article also advocates that societies facilitate people utilizing thinking technologies to make better decisions. This Article finally

---

<sup>513</sup> See generally SUSAN T. FISKE, *ENVY UP, SCORN DOWN: HOW STATUS DIVIDES US* (2012) (examining the neuroscience and psychology of prejudice).

<sup>514</sup> *Susan Fiske Faculty Website*, PRINCETON U. DEP'T PSYCHOL., <http://psych.princeton.edu/psychology/research/fiske/> [<https://perma.cc/C6EZ-J8H2>].

<sup>515</sup> *Id.*

<sup>516</sup> *Id.*

<sup>517</sup> See generally ARE WE BORN RACIST?: NEW INSIGHTS FROM NEUROSCIENCE AND POSITIVE PSYCHOLOGY (Jason Marsh et al. eds., 2010).

<sup>518</sup> See Scott Moss & Peter H. Huang, *How the New Economics Can Improve Employment Discrimination Law, and How Economics Can Survive the Demise of the "Rational Actor"*, 51 WM. & MARY L. REV. 183, 251–53 (2009) (describing antidiscrimination implications of emotional contagion and how positive emotions foster creativity).

<sup>519</sup> See generally ALAN R. ANDREASEN, *MARKETING SOCIAL CHANGE: CHANGING BEHAVIOR TO PROMOTE HEALTH, SOCIAL DEVELOPMENT, AND THE ENVIRONMENT* (1995) (detailing how to change people's behavior); NICK COONEY, *CHANGE OF HEART: WHAT PSYCHOLOGY CAN TEACH US ABOUT SPREADING SOCIAL CHANGE* (2011).

advocates that organizations and societies should foster identity diversity and inclusion. Societies can and should facilitate practicing mindfulness, utilizing thinking technologies, and identity diversity by educating people about and providing people with opportunities to directly experience first-hand mindfulness, thinking technologies, and identity diversity.<sup>520</sup> Offering people opportunities to warm up to or warm onto mindfulness, thinking technologies, and identity diversity are likely to convince many people of the benefits and efficacy of mindfulness, thinking technologies, and identity diversity in improving decision-making competencies in many situations across many domains.<sup>521</sup>

All three proposals exemplify promulgating learning architectures that allow people to better learn how to think about and make decisions.<sup>522</sup> All three proposals do not require, force, or make people do anything.<sup>523</sup> All three proposals also differ from choice architecture and information architecture in explicitly focusing on and analyzing how to effectively teach people to learn how to improve their decision-making processes.<sup>524</sup> 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.<sup>525</sup>

This Article advocates that government should fund additional basic and applied research about how, when, why, and under what conditions various forms of mindfulness, particular thinking technologies, and identity diversity can improve decision-making. There is widespread interest already about mindfulness, thinking technologies, and identity diversity among businesses and the public.<sup>526</sup>

Mindfulness is not expensive to practice and thus is accessible to all.<sup>527</sup> Concerns exist over how large the benefits to

---

<sup>520</sup> *See supra* Introduction.

<sup>521</sup> *Id.*

<sup>522</sup> *Id.*

<sup>523</sup> *Id.*

<sup>524</sup> *Id.*

<sup>525</sup> *Id.*

<sup>526</sup> *See supra* Part II.

<sup>527</sup> TIM RYAN, A MINDFUL NATION: HOW A SIMPLE PRACTICE CAN HELP US REDUCE STRESS, IMPROVE PERFORMANCE, AND RECAPTURE THE AMERICAN SPIRIT xix (2012).

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.<sup>528</sup> Many people who are financially comfortable already have access to some version of and guided training about mindfulness.<sup>529</sup> This Article advocates the democratization of mindfulness to enable people who are disadvantaged, disempowered, or poor to also have access to some version of and guided training about mindfulness. Thinking architecture is also inexpensive to employ and can be accessible to many people.<sup>530</sup> Decision researchers can and should empirically investigate whether different populations who learn about thinking architectures choose wisely in sustainable ways across diverse situations.<sup>531</sup> Thinking technologies vary from inexpensive mobile apps to expensive virtual reality simulators.<sup>532</sup> Government can subsidize the development, dissemination, and consumer adoption of humane games for change, health, and education, and serious games teaching people to recognize and mitigate cognitive biases.<sup>533</sup> As with mindfulness, many people who are financially comfortable already have access to thinking tools for themselves and their kids.<sup>534</sup> This Article advocates the democratization of thinking technologies to enable people who are disadvantaged, disempowered, or poor to also have access to thinking technologies. This Article advocates the dissemination of information about benefits from identity diversity and cognitive diversity in organizations and society.

---

<sup>528</sup> See Brent M. Wilson et al., *Increased False-Memory Susceptibility After Mindfulness Meditation*, 26 PSYCHOL. SCI. 1567, 1567 (2015) (discussing one downside to mindfulness); Tim Lomas, *Recontextualizing Mindfulness: Theravada Buddhist Perspectives on the Ethical and Spiritual Dimensions of Awareness*, 9 PSYCHOL. RELIGION & SPIRITUALITY 209, 209 (2017).

<sup>529</sup> See Claire Adams Spears, *Perceptions of Mindfulness in a Low-Income, Primarily African American Treatment-Seeking Sample*, 8 MINDFULNESS 1532, 1532 (2017).

<sup>530</sup> See BENARTZI WITH LEHRER, *supra* note 57, at 199.

<sup>531</sup> See BENARTZI WITH LEWIN, *supra* note 401, at 2, 5.

<sup>532</sup> JIM BLASCOVICH & JEREMEY N. BAIENSON, INFINITE REALITY (2011); See RANDOM APP OF KINDNESS, <http://www.rakigame.com/#home> [<https://perma.cc/LX8S-MXFN>].

<sup>533</sup> See SUNSTEIN, *supra* note 106, at 32.

<sup>534</sup> See Laura D. Stanley, *Beyond Access: Psychosocial Barriers to Computer Literacy*, 19 INFO. SOC. 407, 407 (2002).

Ideally, societies will one day teach all kids in primary schools about the importance and value of mindfulness, thinking technologies, and identity diversity.<sup>535</sup> Societies should then continue teaching students in secondary schools more in depth about mindfulness, thinking technologies, and identity diversity.<sup>536</sup> Until that day and possibly even after then, colleges, professional schools, and continuing professional education programs can and should teach their students about the benefits of mindfulness, thinking technologies, and identity diversity in particular areas of specialization and professional decision-making domains.<sup>537</sup>

---

<sup>535</sup> *See supra* Introduction.

<sup>536</sup> *Id.*

<sup>537</sup> *Id.*

