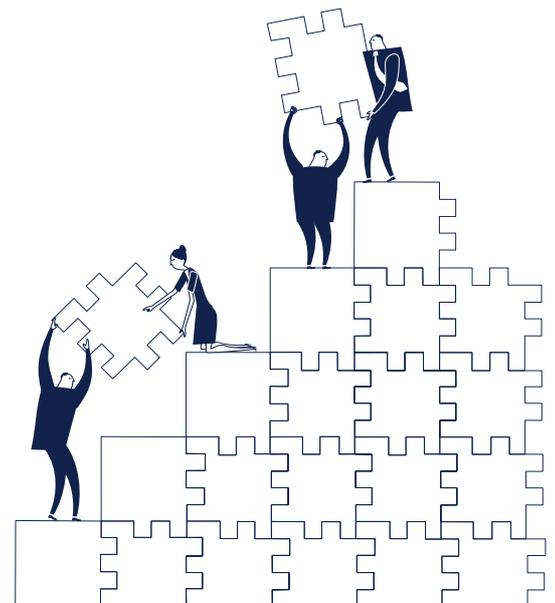

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Nudge: Manager as Choice Architect

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Abstract

In this paper I discuss the role of manager as choice architect. The notion of nudging and choice architecture has received significant interest in law, economics and public policy. But the behavioral insights from this literature also have important implications for managers, HR professionals and organizations. In essence, employees are consumers of choice and are constantly confronted with a large array and interface of options, and this interface can be designed so as to maximize individual welfare and organizational outcomes.

I first discuss the theoretical foundations of the nudge idea and then highlight how managers can design effective choice architectures for the management of human capital. By way of illustration, I specifically focus on four practical areas: 1) nudge hiring, 2) nudge training and development, 3) nudge human capital and organization, and 4) nudge strategy and innovation. Throughout the paper I also point out comparative differences in decision making between contexts (e.g., consumer choice versus decision making in organizations), including implied debates, and also highlight novel opportunities for future research in management and strategy. I particularly focus on the possibilities associated with nudges and choice architectures at the nexus of organizations, crowds and aggregate decision making.

Key words: nudge, decision making, human capital and resources, management

Introduction

The notions of “nudge” and “choice architecture” have recently received significant interest in law, economics and public policy (Jolls et al., 1998; Thaler & Sunstein, 2008; Shafir, 2013). The central intuition behind this literature is that behavioral insights about human nature—for example, an understanding of different biases and heuristics (Tversky & Kahneman, 1974)—can help decision makers to design nudges and choice architectures that improve both individual and collective welfare.

A choice architecture represents the interface—menu, ordering and structure—of options that are available for individuals. How choices are listed or presented, or even generated in the first place, has much to do with decision quality. For example, default settings—opting in versus opting out—for organ donation have obvious large-scale consequences for behavior and societal outcomes (Whyte et al., 2012). Or to provide a more trivial example, the default settings on printers (say, one or two-sided) can have a large-scale environmental impact (Eghebark & Ekstrom, 2013; cf. Croson & Treich, 2014). While there are debates about the underlying coerciveness and even morality of “nudging”—or “shoving”—people in this fashion (e.g., Blumenthal-Barby & Burroughs, 2012; Gigerenzer, 2014; McKenzie et al., 2006; Sunstein, 2014a), nonetheless the possibilities associated with small nudges and big outcomes are intriguing. In public policy circles the nudge idea has led to large-scale research programs and interventions to try to shape environmental policy, public health, race and gender discrimination in society, consumer behavior, stock market dynamics, poverty, and voting behavior (for a recent overview, see Shafir, 2012). These discussions are intriguing as they are highly interdisciplinary (implicating such disciplines as law, economics, psychology and sociology). They have also become a hot topic that bridges scholarship, practitioners and public policy in interesting ways.

The notion of nudging and choice architecture has received little attention in the domain of management and strategy research (with some notable exceptions, which I will discuss). This is surprising as nudge-related experimental insights are highly relevant for managers and organizations. The specific emphasis in the nudge and choice architecture literature is, after all, on how small evidence-based interventions can translate into large-scale individual and collective benefits—a topic

of inherent interest to managers and organizational scholars. Thus the purpose of this article is to delineate management's role in nudging and setting up choice architectures that shape the welfare of employees and the performance of organizations. I will particularly focus on how nudging and choice architecture implicate the management of human capital and resources, thus in essence treating CEOs, managers and HR professionals as the relevant choice architects.

This essay is structured as follows. I will first provide a primer on nudge and choice architectures, particularly as these relate to management and human capital.¹ I will review some central insights about human nature, insights that provide the impetus and enabling structure for nudging and choice architectures. I will then discuss how various nudges might be utilized in the context of organizations and human capital. While many domains could be discussed, I specifically focus on four areas that seem particularly promising: 1) nudge hiring, 2) nudge training and development, 3) nudge human capital and organization, and 4) nudge strategy and innovation. I will also concurrently seek to highlight linkages between nudge and related literatures, as well as existing management research. Throughout the article I also delineate intriguing opportunities for future research, particularly focusing on nudging as it relates to the aggregation of information and aggregate decision making.

Choice Architecture and Human Nature: Some Foundations

Employees are consumers and users of choice. A choice architecture essentially is the interface—menu, ordering and structure of options—that is made available to employees within an organization. Employees are constantly engaged with an interface of choices related to their personal welfare (e.g., whether to participate in retirement savings or stock option plans; cf. Thaler & Benartzi, 2004) as well as choice architectures that shape how they do their work: who they interact with and what they work on and how they work on it.

In their simplest form choice architectures can be as trivial (yet consequential) as the physical surroundings of an employee. For example, the actual layout and functional affordances

¹ While there are recent “handbooks” and primers on nudging and choice architectures (e.g., Ly et al., 2013; Soll et al., 2013; Thaler et al., 2013), none of these specifically focuses on employees, human capital, management and organizations. That said, it is worth noting that the notion of nudge of course is an extremely broad term, and thus implicates and builds on research that has long been done by scholars in areas such as psychology and organizational behavior.

of an office represent an implied choice architecture that shapes attention and the decisions that employees make, with cascading implications for behavior, welfare and even organizational performance. This type of work, on how space shapes decisions and behavior, has in fact recently been done in the context of civic engagement and public spaces (e.g., John et al., 2013).

Similar to physical spaces, the way that choices are presented, designed and ordered on other interfaces has consequences for outcomes. For example, restaurant menus and grocery store shelves direct our attention and feature implicit nudges toward certain products—with very direct implications for consumer behavior and practical outcomes such as weight loss or gain (e.g., Dayan & Hillel, 2011). In behavioral medicine, for example, scholars indeed have highlighted how food choices can be “constructed” and presented in such a fashion as to increase healthy choices and outcomes (Sobal & Bisogni, 2012; cf. Chapman et al., 2010). For better or worse, marketers and scholars of consumer behavior of course are also well aware of the power of these types of nudges and choice architectures (e.g., Carlson et al., 2006; Goldstein et al., 2008; Johnson et al., 2012; Milkman et al., 2010). But choice architectures also have important implications for how employees behave, interact and perform in organizations.

The design and construction of choices can involve a number of considerations. These include: which options are made salient (and how), which options are made available in the first place, the nature of default options, the order of the options, how the options are framed or made salient, what information is available about each option, which options are incentivized, and so forth. The choice architects decisions about each of these questions—and many more—has material consequences for the outcomes that are observed. Thus managers and HR professionals need to be cognizant of how options are “marketed” or presented to employees within the organization.

Stepping back, the central impetus for the need to nudge in the first place comes from findings in psychology related to human nature—of natural inclinations, modes of thought and behavior that need potential correction or some form of enablement or inducement. Understanding “baseline” human tendencies and nature (both on average as well as individual differences) is important as it then, in turn, can inform and contour the interventions and nudges and further suggest

possibilities for which interventions might be effective, for whom, and which not. A particular emphasis in the nudge literature has been placed on the prevalence of various cognitive biases in decision making and the opportunity to correct these in relatively simple ways (Thaler & Sunstein, 2008). This literature can be seen as building on a longer tradition of work on the “boundedness” of rationality (Simon, 1955), specifically where individuals are known to have natural cognitive and attentional limitations that shape their behavior and decision making. These limitations can lead to errors in judgment and behavior—errors that simple nudges may be able to correct.

Another important finding related to human nature and decision making is the human propensity toward decision fatigue and ego depletion (e.g., Baumeister et al., 1998; Vohs et al., 2008). That is, individuals who are faced with a number of choices become exhausted and mentally fatigued—in essence, depleting their will. An awareness of this tendency suggests possible remedies in creating automated or default responses for more trivial decisions and utilizing scarce cognitive resources more effectively in more strategic decision making situations.

Some of the cognitive biases are certainly more relevant to managerial and organizational settings and thus have of course been the subject of attention in management research as well (e.g., Heath et al., 1998; Hodgkinson et al., 1999; Hodgkinson et al., 2011; Powell et al., 2011; Tetlock, 2000). At the individual level the set of relevant biases might include the status quo bias, anchoring, representativeness, availability cascades, hyperbolic discounting, confirmation bias, framing effect, endowment effect, recency effect, mere exposure effect, and stereotyping. At the interactional or social level the set of biases includes such factors as herding or the propensity to following crowds, deindividuation, illusory superiority, fundamental attribution error, social comparison, and social desirability.

The above (and much longer) lists provide an opportunity for a lifetime of work on how each of these biases—in isolation and in the aggregate, and in individual and social contexts—might play out in organizational settings and how they might be corrected. The present list of biases, heuristics and disparate effects is long. Thus a full discussion of all of these biases, as noted by many, is

impossible (no single paper offers a comprehensive catalogue).² However, these biases and heuristics are often divided into individual, social and memory-related categories. Others have argued that they might be divided into motivation-related categories of verification biases, simplification biases and regulation biases (Oreg & Bayazit, 2009). Another helpful meta-distinction, closely related to biases, is the notion of system 1 versus system 2 dual processing (Evans, 2008; Sloman, 1996). The former focuses on more automatic, quick and unconscious processing and choices that are made and the latter on more deliberative, rational and explicit decision making. Both types of processing and bias can be nudged in disparate ways (cf. Alter et al., 2013).

It is worth making some brief observations about this quickly accruing and growing list of cognitive biases. First, some have raised important questions about whether these biases in fact are irrational or simply rational human responses to uncertain and information-saturated environments (e.g., Todd & Gigerenzer, 1999; Krueger, 2011). This literature on “heuristics” has highlighted how many of the seeming biases in fact are effective rules of thumb due to informational, temporal and cognitive limitations. Thus rationality—or the correct choice—is only an artificial, posthoc norm (e.g., derived from an ability to mathematically compute the right choice) rather than ecologically valid or general (Krueger, 2009; Stanovich, 2011; also see Chater & Oaksford, 2012). Second, the full set of biases has many seeming contradictions. For example, in some situations individuals are said to be prone to gather too much information and in others they are said to not gather enough information. This has further suggested a need to articulate how biases map onto and relate to each other, with some seeking to develop taxonomies of biases that appear related (e.g., Hilbert, 2012).

A third concern with biases is that any general statements about biases and human nature of course fail to account for the vast heterogeneity that exists in people’s propensities to succumb to various biases, depending on situational factors or individual differences (cf. Budescu et al., 1997; Stanovich & West, 2000, 2008). In other words, biases are based on averages and central tendencies, thus not recognizing the vast heterogeneity that exists across individuals. The notion of individual differences, as I will discuss, of course provides a highly intriguing opportunity for further study in the context of organizations, strategy and management. Fourth and finally, many of these biases have

² A relatively comprehensive (though growing) list of cognitive biases can be found on Wikipedia: http://en.wikipedia.org/wiki/List_of_cognitive_biases

been studied in a-contextual settings where the specific effect, through random assignment, is pinpointed, thus raising questions of ecological validity and pragmatic generalizability. Most of us, after all, make decisions in highly complex social environments, including organizations, and more generally self-select into decision making situations (cf. Todd & Gigerenzer, 2003).

However, we can partly set aside the above debates (for now) by recognizing the opportunity to identify and target particular biases that in fact do plague organizations (or specific individuals within organizations), and then design evidence-based interventions to correct these. From this, more pragmatic, perspective it isn't necessary to take sides on whether a certain bias in fact suggests irrationality or not, or whether they indeed are efficient heuristics. From a managerial perspective it simply is important to understand these human propensities (including their potential situational triggers, and situational manifestations), which ones might manifest themselves within particular settings in the organization, and then to design interventions that might correct behavior and improve both employee welfare and collective outcomes. As I will discuss, in many consequential situations, employees can indeed be “nudged” in the appropriate ways to make the correct choices, both for them and their organizations, thus reducing decision fatigue and leading to better individual and organizational outcomes.

Before proceeding, I might note that the idea that choices can be shaped of course is scarcely new. The literature on “priming” and unconscious processing highlights how unrelated associations or situational factors can play a powerful role in determining the choices made by individuals. For example, merely holding a warm cup—which can be seen as an implicit “nudge”—can lead one to judge another person as warm and thus worth hiring (Williams and Bargh, 2008). Or, simply touching a teddy bear can increase prosocial behaviors (Tai et al., 2011). There is of course also an older, classic literature in social psychology about how individual perceptions, judgments and decisions are shaped by various social factors (e.g., Asch, 1948, 1952; Latane & Darley, 1970; Michel et al., 1972; Sherif & Hovland, 1961).

In all, the practical implications from much of this research is that individuals can be nudged by constructing the appropriate choice architectures that naturally enable the correction of particular biases or the enablement of heuristics. The basic intuition behind nudging, again, is that how choices

are presented, ordered and structured—essentially, the interface provided to employees—can powerfully impact outcomes. These insights further build on simple intuition related to human perception, how certain features of the environment can be made more salient to decision makers (cf. Hoffman & Singh, 1997), directing the attention of individuals to certain factors (and perhaps away from others), in hopes of better decisions. The salience of different options, for example, can be manipulated by making them more visible or attractive or primary, thus leading to their choice.

Concerns about manipulating individuals to make certain choices are perhaps somewhat lessened in organizational and managerial settings. Specifically, employee-employer relationships tend to be voluntary and thus there is some sense that employees cede some level of control of decision making and their environments to managers and the organization. But concerns about manipulation are of course important here as well. But, as I will discuss, employees can be enlisted in the process of identifying potential biases, associated correctives, desired outcomes and feasible solutions. More foresighted managers and organizations can work jointly with their employees to create an environment that nudges decision making in ways that are jointly identified and discussed. For these reasons, the notions of nudge and choice architecture are even more applicable for managerial contexts than the public policy settings from which they originate.

The set of possible nudge and choice architecture-related insights and applications for management and HR professionals are extremely large. Thus I focus on four, broad contexts where the possibilities seem promising: 1) nudge hiring, 2) nudge training and development, 3) nudge human capital and organization, and 4) nudge strategy and innovation. I discuss both the application and research-oriented possibilities associated with these four areas.

Nudge Hiring

One of the immediate implications of the biases literature is the opportunity to create nudges and interventions that might correct biases in the context of hiring. After all, attracting the right talent to organizations is arguably among the most central capabilities of an organization, with obvious implications for organizational performance (Cappelli & Keller, 2014; Felin & Hesterly, 2007). The set of biases and heuristics that might hamper or enable the recruitment of talent into organizations include ones that can be applied to the recruits themselves, as well as the process of the evaluation of

recruits and any associated recruiter or organizational biases and heuristics. I first discuss relevant concerns associated with recruits themselves, such as self-assessment, along with potential nudges, and then discuss recruiter biases, heuristics and correctives.

Individuals struggle to objectively assess themselves and thus are prone to a host of biases such as illusory superiority (Hoorens, 1993). Illusory superiority is the propensity toward an over-inflated self-conception, specifically where 90% of people rate themselves as “above average” on a number of dimensions. This can further be compounded by the problem that incompetence in an assessed domain is coupled with the lack of ability to self-assess and even recognize one’s lack of incompetence (Kruger & Dunning, 1999). In some cases there is an illusion of inferiority (Moore, 2007). But more generally self-assessments and portrayals of the self tend to be inflated, which of course can further be compounded in recruiting situations where individuals have every incentive to portray their best possible self (cf. Swift et al., 2013). Thus other relevant biases related to prospective employees include a tendency toward unwarranted over-confidence (Moore & Healy, 2008) or a self-serving bias where any negative information about one’s self is rejected (Campbell & Sedikes, 1999) as well as a more general egocentric bias (Ross & Sicoly, 1979). Though self-enhancement is a general tendency observed in a number of settings, it can however be corrected by asking people to anchor to a norm (see Krueger, 1998; cf. Schultz et al., 2007). Furthermore, naturally no manager solely relies on information provided by candidates, instead trying to triangulate skills and talent through references, objective testing and comparison, interviewing and so forth. Though, interviews also can introduce a new set of biases (McDaniel, 1994).

The findings on individual differences related to biases, including the ones listed above, provide an opportunity to perhaps assess candidates related to their propensity toward engaging in biased behavior. For example, increased competence in particular domains is also correlated with more realistic self-assessment (Stanovich, 2011). Some have a propensity to even underestimate their skills and influence (cf. Bohns & Flynn, 2013). Hiring organizations might themselves assess candidates on their likelihood to succumb to certain, work-related biases. Tests like the Big Five personality test have of course long been utilized in recruiting and selection, and adding relevant bias-related materials might also enable further evidence-based insights into the hiring and selection

process. Identifying individual differences related to specific biases and heuristics could allow firms to identify relevant decision making skills. More generally, a particularly fruitful opportunity exists in mapping the set of relevant biases and heuristics with job related activities (cf. Rynes et al., 2002).

An equally actionable opportunity exists in identifying the set of biases and heuristics that might plague or enable organizations as they solicit applications and screen and compare candidates. The opportunities here start with the identification and solicitation of a pool of candidates. While the available pool of candidates is often implicitly assumed to be fixed—provided by the “market” (for example, based on an advertisement)—naturally the set of candidates that apply for a position is strongly shaped by the set of individuals within the informal networks and relationships of individuals already in the organization (cf. Granovetter, 1995). Thus there can be an implicit bias in that the pool is somehow independent of the individuals within the organization—though of course there is a natural, strong propensity to hire people that already are somehow linked to the organization, through informal networks or other ties. This of course is a perfectly rational outcome in many situations, in small fields where experts are likely to be linked and know each other through professional conferences and other external engagements.

But existing social ties can be both an effective heuristic as well as a source of bias in hiring and selection, and thus these ties can lend themselves to both corrective nudging and more enabling practices. Relatively widespread practices such as employee referral programs are an effort to tap into the informal networks of employees. As recently summarized by Burks et al (2013), prospective recruits referred by employees are more likely to accept job offers, less likely to leave the company, more productive, and generate more profit for the company. Firms thus can tap into the “social capital” of their employees by enlisting a richer pool of candidates that might fit well with the organization (Fernandez et al., 2000). Though, some evidence suggests that referred employees may not necessarily be more productive, per se, but simply more likeable—highlighting how seemingly objective assessment of performance and merit is in fact biased by existing social ties (Schwed & Kalev, 2014).

The more general social structure of relationships—who is in one’s network in the first place—is important to understand as it naturally shapes who is in the applicant pool. Understanding

the tendency toward homophily in social relationships is central, as this homophily has both bias and heuristic-related implications for hiring and organizations. Homophily is the human propensity to identify with and inherently like and be drawn to and befriend self-similar individuals. In short, homophily is a well-established finding in the social sciences (McPherson et al., 2001) and highlights the widespread self-similarity in most of our social interactions—who we associate with, befriend or unfriend. These similarities relate to both value (religion, political outlook, etc) and demographic (education, race, gender, etc) characteristics. Organizations more broadly can be seen as driven by this self-similarity, where similar individuals are attracted to, selected by and retained by organizations (Schneider, 1987).

But there are of course biases and pathologies associated with hiring based on referrals and self-similar networks.³ For example, existing patterns of gender or race bias can be reinforced through referral programs (Cohen et al., 1998; Fernandez et al., 2000). If an organization already is homogeneous on certain dimensions, then these patterns are likely to be further reinforced as the pool of referred candidates is likely to include a high number of individuals with self-similar characteristics.

Thus simple nudges—whether incentives or otherwise—to signal the need for diversity can help the organization improve its hiring processes and disrupt any pathologies associated with self-similar hiring (Fernandez & Weinberg, 1997; Rubineau & Fernandez, 2013). Hiring diverse candidates can become both an ethical and performance-related imperative for organizations (Herring, 2009; Page, 2007). More generally, the climate of the organization can signal that diverse individuals are welcome, or not (Nishii, 2012).

Another simple nudge related to biased hiring is to focus on and spotlight any extant successes or “positive deviance” that might exist within the organization (cf. Marsh et al., 2004). The notion of finding successes within the organization, rather than imposing outside interventions, can nudge behaviors in the right direction. In other words, a powerful nudge can be created by

³ The human propensity toward homophily—interaction and befriending of self-similar individuals—was aptly illustrated by Ingram and Morris (2007) in a clever experiment. They tracked the movement of individuals at a networking event, to see who interacted with whom, for how long. While individuals stated that their ex ante goal in attending the event was to meet new people, interaction was primarily structured around previous friendships and self-similarity.

highlighting hiring behaviors and decisions that already are accomplishing the right outcomes, and then scaling these into the rest of the organization.

Other well-known biases associated with hiring have to do with the human propensity to inherently like or prefer others based on their outward appearance, for example their physical attractiveness (Marlowe et al., 1996; Sharon & Mizzi, 2014). People tend to make implicit and automatic associations between physical attractiveness (or gender or race) and competence (cf. Landy, 2008), which of course can be further reinforced through subsequent interactions with not just co-workers but customers as well (Hekman et al., 2010). These types of biases can readily be corrected and nudged through awareness and through choice architectures that make the key skills, rather than bias-inducing factors, salient to decision makers. For example, managers can make job performance more salient. For example, joint versus separate evaluation of candidates can lead to less biased hiring outcomes (Bohnet et al., 2012).

Another intriguing hiring-related bias is a seeming “preference for potential” over preference for actual achievement (Tormala et al., 2012). This bias is intriguing as it both appears irrational but also highlights some potential competitive and strategic implications of hiring. That is, in a competitive hiring context achievement is readily identifiable by others (focal firm’s competitors), and thus the preference for potential bias is perhaps partly rational. Hiring managers may implicitly hope to provide those with potential, versus those with actual achievement, a venue for them to realize that potential. We might speculate that some measure of credit-taking of course may also play a role (on the part of the hiring manager or organization), along with wage differences associated with hiring someone with potential versus someone with actual achievement in the relevant domain.

This raises an intriguing opportunity at the nexus of analytics, bias and hiring. There are a host of collective biases—perhaps held by professions or industries more widely—about which skills and competencies might lead to the best performance. As alluded to by Wolfe et al’s (2006) discussion of *Moneyball* (Lewis, 2004), there are significant opportunities for managers and HR professionals to more carefully analyze the set of skills and competencies that indeed are central for organizations, and those that merely appear to be so—leading to bias. The promise of marrying

insights from analytics and research on cognitive biases and heuristics offers a significant opportunity for both practice and research (cf. Davenport & Harris, 2007).

Nudge Training and Development

The amount of resources spent on training and development in organizations is significant. In the US alone, some \$135 billion is spent each year on training and development (Patel, 2010; Salas et al., 2012). Unfortunately much of this training and development is scarcely evidence-based, or experimental, and the content frequently reflects little more than casual insights from pop psychology (Briner & Rousseau, 2011; e.g., see Locke, 2005).

The notion of nudging and choice architecture, then, links nicely with recent calls for training and development and managerial practice to be more evidence-based (e.g., Bartunek & Rynes, 2010, 2014; Pfeffer & Sutton, 2006; Rousseau, 2012; Rousseau et al., 2008). While there may be some debate about what the relevant “evidence” ought to be, given that scientific arguments scarcely are settled (as illustrated by our discussion of biases versus heuristics), nonetheless the general impetus for more evidence-based and scientific approaches to training is likely to find broad agreement.

The basic intuition behind nudging and choice architectures provides a highly fruitful array of content for training and development within organizations. The emphasis on small-scale interventions and nudges, with large-scale consequences, can help with buy-in, feasibility and the likelihood of actual implementation by employees. Managers and HR professionals can thus identify the set of problems faced by employees individually and collectively and then tailor interventions accordingly. More general “self-improvement” advice based on basic principles associated nudging and choice architectures might also be welcomed and lead to novel implementations and “self-nudges” on the part of employees and managers in organizations.

Most employees and managers hope to improve their decision making on some dimensions—whether in daily, personal choices related to food consumption or exercise or the more general use of one’s time. Falling prey to environmental temptations that distract from reaching various goals is of course a common problem, though one where employees can design interventions, nudges and experiments to realize better outcomes. Simply removing access to unwanted choices of course represents a simplistic nudge. Also, various forms of precommitment, social primes and self-

regulation can nudge individuals to make the right choices and reach desired outcomes (Ariely & Wertenboch, 2002; Ashraf et al., 2006; Hofmann et al., 2007; Hofmann et al., 2012). The general “weakness of will” and human impulsiveness can be nudged to ensure better outcomes (cf. Ainslie, 1975; Ainslie, 2001). And the very idea of ego depletion and choice fatigue is highly applicable in any context. Recent studies on action versus inaction toward goals also suggest powerful and simple nudges that can lead to better decisions and outcomes (e.g., Albarracin et al., 2011)

The set of possible biases that might be the basis of training and development of course is extremely large. Perhaps one meta-bias, of sorts, worth singling out in the training and development context is the “bias blind spot.” That is, individuals have a hard time seeing biases in themselves (Pronin, Lin & Ross, 2002). Biases are easily ascribed to others, but there are varying abilities to see these biases in one’s self. Simple tests to highlight employee blindspots to this and other biases, and potential nudges and corrections, can provide highly useful content for training and development. The benefits of nudge-related intuition in the training and development context is that the insights are easily illustrated, both in terms of their nature and payoffs, and the small-scale nature of the nudges is likely to induce adoption by employees. Furthermore, nudge-related insights can be utilized by the organization in an experimental sense, where some groups act as controls for particular nudges or choice architectures. This type of experimentation rarely happens in organizations, though provides a significant opportunity.

Training and development of course can be highly heterogeneous depending on the specific target audience within the organization. For example, those in charge of procurement in an organization might be trained on a host of biases that are likely to impact purchasing decisions: anchoring, confirmation, representativeness and so forth. Knowledge of these biases—and associated nudge and interventions—is also likely to be highly useful for those making strategic decisions on behalf of the organization. Cost-cutting measures in organizations are particularly fruitful places for unobtrusive, small nudges that can result in significant cost savings. Here the research on the power of defaults in decision making can be highly instructive. Simple defaults on printing, travel-related expenditures, or even savings and retirement choices, can have significant individual and collective payoffs (e.g., Carroll et al., 2009; Sunstein, 2014b).

A bias that implicates individuals throughout the organization, and thus is a fruitful target for training and development, is the curse of knowledge (Camerer et al., 1989; Heath & Staudenmayer, 2000). The curse of knowledge is the inability of experts to put themselves into the shoes of novices. The problem is that adding unrelated knowledge or information can lead to a bias of overconfidence about decision making, where related knowledge is ignored (Hall et al., 2007). For example, managers seeking to change organizations may implicitly assume that everyone has the same background information and understands the need for change. Differences in functional background are likely to exacerbate the curse of knowledge, and lead to conflict. Thus the curse of knowledge can lead to broader coordination problems within organizations (Thomas et al., 2014), between disparate departments that have their own language and culture. Here again, awareness of these tendencies, and simple nudges and correctives to overcome them, can lead to beneficial outcomes. For example, perspective taking, making similarities more salient, and simplification can help overcome the curse of knowledge (e.g., Nickerson, 1999; Todd et al., 2011). In all, nudge training and development provides a significant opportunity for practice and research.

Nudge Human Capital and Organization

The set of nudge-related insights related to human capital, and particularly its management and organization are significant. My focus here is specifically on how the organization of human capital can act as a nudge and materially impact both individual and collective performance. In some ways, organizations inherently correct certain types of biases by their very nature (cf. Arrow, 1974), in that they can gather more information and create structures for processing that knowledge (Stinchcombe, 1990). Though, organizations of course can also inadvertently amplify certain types of bias. As the biases literature is relatively individualistic, and often a-contextual, these types of considerations have not received much attention (cf. Heath & Sitkin, 2001; Whetten et al., 2009).

Knowledge of particular biases can help managers structure social interactions and the organization in such a way as to avoid (or lessen) the manifestation of these biases. For example, social interactions can increase one's confidence in decision making, but simultaneously lead to poorer decisions (Heath & Gonzalez, 1995). Or, to provide another example, tendencies toward social comparison and envy can have a powerful, detrimental impact on organizational performance (e.g.,

Nickerson and Zenger, 2008; also see Suls et al., 2002). Combined with the inability of some to accurately estimate their own skills and contributions, social comparison can lead to organizational pathologies where individuals feel they are unfairly treated, or simply leave the organization (Carnahan et al., 2012). Managers can nudge and influence these social interactional and comparison processes by creating mechanisms that properly impute contributions to rewards and more generally where the social comparison is seen as fair. Who one compares oneself to, whose efforts are most salient, also provide an opportunity for nudging.

Another organizationally-relevant bias is the team scaling fallacy (Staats et al., 2012). It is common to assume that simply adding additional people to a project will necessarily translate into better outcomes or faster completion. However, the propensity toward social loafing and free-riding is a well-established finding in a number of settings (Latane et al., 1979). Furthermore, in larger collective settings individuals are likely to “deindividuate” and thus take less responsibility for poor outcomes (Lerner & Tetlock, 1999) and of course larger credit for positive outcomes (cf. Gilbert and Malone, 1995). Organizations can therefore be designed in such a fashion where these types of biases are circumvented in the first place. For example, simple heuristics and rules of thumb about the optimal size of teams and projects can lead to better outcomes.

Perhaps one of the more intriguing opportunities is to study the nature of rationality in the organizational context (cf. Whetten et al., 2009; also see Shafir & LeBoeuf, 2007). Much of management research simply borrows individual-level concepts—about, say, biases—and applies them to organizations (Cappelli & Scherer, 1991; Heath & Sitkin, 2001; Johns, 2006). As I have discussed, undoubtedly many of the same cognitive biases exist in organizations, just as has been found in more a-contextual decision making experiments and settings. However, there is an opportunity to specifically study how the organizational context perhaps amplifies certain biases and perhaps inherently corrects others. Relatively little work has been done on this issue. Organizations, as a context, are unique in that they feature hierarchy, delegated decision rights, incentives and rewards, principal agent relationships and many other features (cf. King et al., 2010). These and other factors are likely to play a big role in how decision making is shaped and the types of nudges that are relevant. The experimental study of bias within organizational and social interactional settings could also

powerfully be done by organizations themselves. Applying this type of experimental, more evidence-based approach to organizations could lead to powerful research-practice linkages.

One, particularly intriguing, finding is that people do somehow think and decide differently when taking on the “role” of an organization (Goffman, 1959; cf. King et al., 2010). This would appear to have both benefits and costs—where taking on the role of the organization might perhaps lead to broader perspective taking, but perhaps also some forms of deindividuation. Individual decision making, then, needs to be studied in the role-based contexts that employees find themselves in. Indeed, individuals make complicated attributions of mind to other social actors and even objects (Epley et al., 2007; also see Waytz et al. 2010) and understanding the implications of this is central for organizations.

Finally, the broader micro-macro links between individual-level and organizational factors deserve significantly more attention (Barney & Felin, 2013). Again, biases in organizational settings do not simply aggregate in linear fashion, but there are complex interactional and social processes that mediate and contour decision making in organizations. Even very basic ideas around how bounded rationality might aggregate have not meaningfully been studied. Furthermore, recent attention on large-scale projects in organizations and social systems, and associated pathologies (e.g., Bartunek et al., 2011; Flyvbjerg, 2009), might further be informed by understanding how more micro decision making and small nudges could circumvent and correct biases that manifest themselves in the aggregate.

Nudge Strategy and Innovation

The notion of nudging and choice architecture also has large-scale implications for strategy and innovation. Scholars have already pointed out how biases and heuristics implicate strategic decision making (e.g., Hodgkinson & Healy, 2011; Powell et al., 2011). Thus I here concentrate on an additional set of considerations, particularly as these relate to human capital in organizations, as well as the aggregation of information.

Strategy and innovation deals with decision making under uncertainty, while the nudge and choice architecture literature (in public policy, law and economics) tends to focus on situations where the desired choices and outcomes are relatively well known, and appropriate nudges toward welfare-

enhancing choices can be designed accordingly. But organizations of course face radical uncertainty and often are making large-scale strategic decisions with little information (Feduzi & Runde, 2014; Felin, Kauffman, Koppl, & Longo, 2014). Existing work has of course pointed out how biases such as over-confidence, representativeness and undue risk-taking can impact strategic decision making in managerial and entrepreneurial settings as well (e.g., Busenitz & Barney, 1997). But my emphasis here is on the need to nudge organizations toward increased variance in the overall choice or possibility sets—from which the organization then might choose the best option. Thus the mechanisms of error- or bias-correction come after nudges are in place for ensuring sufficient variance, where a large number of options are first laid out on the table. The subsequent selection process can include various forms of collective wisdom—tapping into the proverbial wisdom of crowds—which also feature implied nudges and choice architectures.

One way to think about nudge in the context of strategy and innovation is to consider how human capital might be more appropriately utilized to ensure that information is effectively aggregated and that the best decisions are made (cf. Hayton, 2005). While decision making is often conceptualized as a single-actor activity, naturally organizations can benefit from the fact that they are constituted by diverse individuals who can provide valuable signals, opinions and information to the organization (Arrow, 1974). A literature on the “wisdom of crowds” can provide valuable insights on how this activity can be structured (cf. Felin & Zenger, 2011; Yaniv & Milyavsky, 2007).

For example, one powerful way to address individual-level biases in strategic decision making is to enlist everyone in the organization in making judgments about the products or potential strategies of the organization. Companies have effectively utilized practices such as internal prediction markets as a way of gathering information about the potential value and possibilities associated with their products (cf. Wolfers & Zitzewitz, 2004). For example, Google has utilized an internal prediction market as an information aggregation tool (Cowgill et al., 2009). The benefit of prediction market-like practices is that they can provide a much-needed “check” on individual decision making, and the propensity of individuals to escalate commitment and to be overly optimistic about their own projects. A set of independent eyes can provide a helpful, additional signal about the comparative viability or value associated with projects within the organization. Simple voting mechanisms, of course, might

also be beneficial when comparing projects. These prediction markets, intriguingly, have also recently been suggested as a mechanism and way of identifying expertise and talent (Budescu & Chen, 2014).

Structures within organizations also serve as a way of amplifying certain biases and heuristics, with significant implications for strategy and innovation. For example, traditional hierarchies require approvals on projects and initiatives from higher-level managers, and thus these types of structures can amplify a bias toward risk-aversion and status quo (Sah & Stiglitz, 1986; also see Levinthal & Knudsen, 2007). In other words, while managerial fiat and the need for approval indeed does reduce the chance of certain types of bias and error, it introduced another bias in that it decreases the likelihood of introducing novelty and value that might come from pursuing riskier projects. On the other hand, radically flat organizational structures such as polyarchy—where anyone can approve projects and work on them—can lead to much-needed variance, but can also in turn amplify the propensity toward the escalation of commitment, along with amplifying any number of other individual biases.

An intriguing nudge and choice architecture that partly remedies some of these individual and social biases—thus more effectively utilizing human capital—is the use of social thresholds and tipping points in strategic decision making (cf. Felin & Powell, 2014). Scholars have pointed out how self-organization can lead to powerful outcomes where employee self-selection onto projects provides a valuable signal about the opportunities that should be pursued (Foss, 2003). Recently the highly successful software company Valve Corporation has utilized this type of tool by allowing individuals to self-generate and self-select into projects (Valve, 2012). The company relies on a mechanism of self-selection and peer recruiting to organically identify emerging opportunities. The company has specifically developed a nudge and choice architecture of sorts, their “rule of three” (Felin & Powell, 2014). If three people think that a project is worthwhile, and want to engage on it, then they are allowed to do so. The mechanism of recruitment, peer interaction and competing projects creates an internal ecosystem that effectively identifies promising opportunities. Here individual biases are partly checked by the need to attract a quorum of three, and any social biases are partly checked by the promise and lure of alternative projects and possibilities.

Another, highly relevant nudge relates to how individuals are allowed to interact when engaging in brainstorming or other activities that are highly relevant to strategy and innovation. There are well-known biases and productivity losses that occur when brainstorming happens in public or social settings (Diehl & Stroebe, 1991). Individuals are likely to withhold information, socially loaf, anchor on extant answers and engage in a host of other, unproductive activities if brainstorming is done publicly. However, engaging in independent processing and thought can yield far richer possibilities—a highly simple nudge with large-scale consequences. That is, simply requiring independent processing and brainstorming vastly increases individual productivity. The group and organization, then, can effectively be utilized to cull and select the best options. These distinctions, of when the interaction of human capital is warranted and when not, are highly important and consequential for strategy.

Another highly relevant bias to the strategy and innovation context is functional fixedness (Duncker, 1945; McCaffrey, 2012). One assumption in strategy is that factor or product markets are efficiently priced (Barney, 1986), and thus there are no opportunities for the novel utilization of products or factors that might be purchased from the market (Felin et al., 2014). Seeing things as functionally fixed and categorical is biased by present uses and thus there are opportunities to nudge individuals and organizations toward finding new uses for seemingly efficiently priced factors. For example, hiring can play a role in shifting organizational perceptions about fixedness (cf. Franke et al., 2013). And psychology research offers a number of potential nudges that might accomplish this, including reasoning by analogy, the power of serendipity and play, brainstorming, the introduction of novel primes, and so forth. Intriguingly, external evaluators (such as analysts and investors) of course also have biases that may affect how they evaluate, categorize and assess the strategies of companies (Litov et al., 2012), and nudges might also be designed by organizations to ensure more informed decision making by these external stakeholders.

In all, there are significant opportunities for delineating and studying the set of biases and heuristics that are relevant for strategy and innovation contexts, and then designing mappings for how these might be corrected and enabled in ways that best utilize human capital. The nexus of psychology and strategy indeed offers a promising place where micro and macro insights can

powerfully inform each other and lead to important managerial and practical insights (Barney and Felin, 2013; Hodgkinson et al., 2011; Ployhart, 2012; Powell et al., 2011). Extant research in the domain of human capital and talent focuses heavily on work-specific (“KSAOs”) knowledge, skills, abilities and personal characteristics (e.g., Campbell et al., 2010; Ployhart et al., 2014). But there is also a broader opportunity to extend this work into the domain of how human capital might be nudged in appropriate ways to ensure the best individual and organizational outcomes. Furthermore, the long-discussed promise of *strategic* human resources (Jackson et al., 2012) can further be realized by incorporating insights from behavioral psychology into strategic decision making and the management of human capital. In short, part of the remit of managers and HR professionals should be seen as the management and direction of individual and aggregate cognition within and across organizations. While there is excellent work on cognition and strategy (for a recent overview, see Eggars & Kaplan, 2013; Moore & Flynn, 2008), there is an opportunity to also focus on the more proactive interventions and nudges that are available for managers as they direct and aggregate perceptions, judgments and decisions in strategy and innovation-related settings.

Aggregate information processing and decision making—within and across organizations—more generally is an exciting area for future research. Central questions here include how we might nudge and motivate individuals to engage in productive thinking and judgment, and how this information, in the aggregate, might be utilized by organizations. For example, organizations can use various practices such as the “rule of three” discussed above (where self-selection is the key mechanism), or practices such as the use of prediction markets (where a mix of independent judgment and perhaps extrinsic rewards play a central role), but they may also reach out and seek to nudge external “crowds” and customers to participate in value generating efforts on behalf of the organization (Boudreau & Lakhani, 2013; Felin and Zenger, 2011). Some organizations (such as Google) of course already utilize the cognition and decisions of their customers in clever ways—often unawares to the customers themselves—for example by experimenting with disparate choice interfaces (thus amassing evidence about which nudges might work), by aggregating customer decisions and feeding this information back into their products. The design of more micro choice architectures, both vis-à-vis employees and customers, and the scaling and aggregation of this

information and decisions provides a powerful opportunity at the nexus of evidence-based practice and research.

Conclusion

The central contribution of this paper has been to highlight how managers play an important role in nudging or specifying the choice interface—menu, structure and ordering of choices—available for employees in an organization. These choice architectures offer opportunities for relatively minimal interventions and nudges with significant impact on employee welfare, engagement and organizational performance. While the set of possible applications of nudge to management and HR practice are extremely large, I have specifically focused on hiring, training and development, human capital and organization, and strategy and innovation. Nudge-related intuition can provide a powerful bridge for linking management research and practice. Nudging and choice architectures lend themselves to evidence-based approaches to managerial practice, and the possibility of smaller-scale experimentation with potentially large-scale impact. The domain of management and human resources has been a particularly fruitful area for precisely this type of knowledge sharing between scholars and practitioners (e.g., Hayton et al., 2011; Rousseau, 2012), and the notion of managers as choice architects represents a significant opportunity to further deepen the relationships between scholarship and practice.

References

- Ainslie, G. (1975). Specious reward: A behavioral theory of impulsiveness and impulse control. *Psychological Bulletin*, 82, 463-496.
- Ainslie, G. (2001). *Breakdown of will*. Cambridge University Press.
- Albarracín, D., & Wyer, R.S. (2000). The cognitive impact of past behaviour: Influences on beliefs, attitudes, and future behavioral decisions. *Journal of Personality and Social Psychology*, 79, 5-22.
- Albarracín, D., Hepler, J., & Tannenbaum, M. (2011). General action and inaction goals: Their behavioural, cognitive, and affective origins and influences. *Current Directions in Psychological Science*, 20, 119-123.
- Alter, A.L., Oppenheimer, D.M., Epley, N., Eyre, R.N. (2007). Overcoming intuition: Metacognitive difficulty activates analytical reasoning. *Journal of Experimental Psychology*, 136, 569-576.
- Ariely, D., & Wertenbroch, K. (2002). Procrastination, deadlines and performance: Selfcontrol by pre-commitment. *Psychological Science*, 13, 219-224.
- Arrow, K. (1974). *The limits of organization*. W.W. Norton.
- Asch, S. E. (1948). The doctrine of suggestion, prestige and imitation in social psychology. *Psychological Review*, 55, 250–276.
- Asch, S.E. (1952). *Group forces in the modification and distortion of judgments*. Prentice Hall.
- Ashraf, N., Karlan, D., & Yin, W. (2006). Tying Odysseus to the mast: Evidence from a commitment savings product in the Philippines. *The Quarterly Journal of Economics*, 121(2), 635-672.
- Barney, J., (1986). Strategic factor markets: Expectations, luck and business strategy. *Management Science*, 17(1): 99-120.
- Barney, J., & Felin, T. (2013). What are microfoundations? *Academy of Management Perspectives*, 27, 138-155.
- Bartunek, J.M., & Rynes, S.L., (2014). Academic and practitioners are alike and unlike: The paradoxes of academic-practitioner relationships. *Journal of Management*, 40, 1181-1201.
- Bartunek, J.M., & Rynes, S.L., (2010). The construction and contributions of implications for practice: What's in them and what might they offer? *Academy of Management Learning and Education*, 9, 100-117.
- Bartunek, J.M., Balogun, J., & Do, D. (2011). Considering planned change anew: Stretching large group interventions strategically, emotionally, and meaningfully. *Academy of Management Annals*, 5, 1-52.
- Baumeister, R.F., Bratslavsky, E., Muraven, M., & Tice, D.M. (1998). Ego depletion: Is the active self a limited resource. *Journal of Personality and Social Psychology*, 74, 1252-1265.

- Blumenthal, J.S. & Burroughs, H. (2012). Seeking better health care outcomes: The ethics of using the “nudge.” *American Journal of Bioethics*, 12, 1-10.
- Bohns, V.K., & Flynn, F.J. (2013). Underestimating our influence over others at work. *Research in Organizational Behavior*, 33, 97-112.
- Bohnet, I., Van Geen, A.V., & Bazerman, M.H. 2012. When performance trumps gender bias: Joint versus separate evaluation. Harvard Kennedy School working paper, RWP12-009.
- Boudreau, K., & Lakhani, K.R. (2013). Using the crowd as innovation partner. *Harvard Business Review*, 91, 60-69.
- Briner, R.B., & Rousseau, D.M. (2011). Evidence-based I-O psychology: Not there yet. *Industrial and Organizational Psychology*, 4, 3-22.
- Budescu, D.V., & Chen, E. (2014). Identifying expertise to extract the wisdom of crowds. *Management Science*, forthcoming.
- Budescu, D. V., Wallsten, T. S., & Au, W. T. (1997). On the importance of random error in the study of probability judgment: Part 2. Applying the stochastic judgment model to detect systematic trends. *Journal of Behavioral Decision Making*, 10(3), 173-188.
- Burks, S.V., Cowgill, B., Hoffman, M., & Housman, M.G. (2013). The facts about referrals: Toward an understanding of employee referral networks. SSRN.
- Busenitz, L.W., & Barney, J., (1997). Differences between entrepreneurs and managers in large organizations: Biases and heuristics in strategic decision-making. *Journal of Business Venturing*, 12, 9-30.
- Carlson, K.A., Meloy, M.G., & Russo, J.E. (2006). Leader-driven primacy: Using attribute order to affect consumer choice. *Journal of Consumer Research* 32, 513-518.
- Camerer, C. Loewenstein, G., Weber, M. (1989). The curse of knowledge in economic settings: An experimental analysis. *Journal of Political Economy* 97: 1232–1254.
- Campbell, B. A., Coff, R., and Kryscynski, D. (2010). Rethinking sustained competitive advantage from human capital. *Academy of Management Review*, 37, 376–395.
- Campbell, W.K., & Sedikides, C. (1999). Self-threat magnifies the self-serving bias: A meta-analytic integration. *Review of General Psychology*, 3, 23-43.
- Cappelli, P., & Sherer, P. D. (1991). The missing role of context in OB: The need for a meso-level approach. *Research in Organizational Behavior*, 13, 55-111.
- Cappelli, P., & Keller, J.R. (2014). Talent management: Conceptual approaches and practical challenges. *Annual Review of Organizational Psychology and Organizational Behavior*, 1, 305-331.
- Carnahan, S., Agarwal, R., & Campbell, B.A. (2012). Heterogeneity in turnover: The effect of relative compensation dispersion of firms on the mobility and entrepreneurship of extreme performers. *Strategic Management Journal*, 33, 1411-1430.
- Carroll, G. D., Choi, J. J., Laibson, D., Madrian, B. C., & Metrick, A. (2009). Optimal defaults and active decisions. *The Quarterly Journal of Economics*, 124(4), 1639-1674.

- Chapman, G. B., Li, M., Colby, H., & Yoon, H. (2010). Opting in vs. opting out of influenza vaccination. *Journal of the American Medical Association*, 304, 43-44.
- Chater, N. & Oaksford, M. (2012). Normative systems: Logic probability and rational choice. In *Oxford Handbook of Thinking and Reasoning*. Edited by Holyoak, K & Morrison, R.G.
- Cohen, L.E., Broschak, J.P., Haveman, H.A. (1998). And then there were more? The effect of organizational sex composition on the hiring and promotion of managers. *American Sociological Review*, 63, 711-727.
- Cowgill, B., Wolfers, J., & Zitzewitz, E. (2009). Using prediction markets to track information flows: Evidence from Google. SSRN working paper.
- Croson, R. & Treich, N. (2014). Behavioral environmental economics: Promises and challenges. *Environmental Resource Economics* 58, 335-351.
- Davenport, T.H., & Harris, J.G. (2007). *Competing on analytics: The new science of winning*. Harvard University Press.
- Dayan, E., & Bar-Hillel, M. (2011). Nudge to nobesity II: Menu positions influence food orders, 6, 333-342.
- Diehl, M., & Stroebe, W. (1987) Productivity loss in brainstorming groups: Toward the solution of a riddle. *Journal of Personality and Social Psychology*, 53, 497-509.
- Duncker, K., (1945). On problem-solving. *Psychological Monographs*, 58, 1-113.
- Eggars, J.P., & Kaplan, S. (2013). Cognition and capabilities: A multi-level perspective. *Academy of Management Annals*, 7, 295-340
- Eghebark, J., & Ekstrom, M. (2013). Can indifference make the world greener. SSRN.
- Epley, N., Waytz, A., & Cacioppo, J.T. (2007). On seeing human: A three-factor theory of anthropomorphism. *Psychological Review*, 114, 864-886.
- Evans, J.S.B.T. (2008). Dual-processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology*, 59, 255-278.
- Feduzi, A., & Runde, J. (2014). Uncovering unknown unknowns: Towards a Baconian approach to management decision-making. *Organizational Behavior and Human Decision Processes*, 124, 268-283.
- Felin, T., & Hesterly, W.H. (2007). The knowledge-based view, nested heterogeneity, and new value creation: Philosophical considerations on the locus of knowledge. *Academy of Management Review*, 32, 195-218.
- Felin, T., & Zenger, T.R. (2011). Information aggregation, matching and radical market-hierarchy hybrids: Implication for the theory of the firm. *Strategic Organization*, 9(2), 163-173.
- Felin, T., Kauffman, S., Koppl, R., & Longo, G. (2014). Economic opportunity and evolution: Beyond landscapes and bounded rationality. *Strategic Entrepreneurship Journal*. Forthcoming.
- Felin, T., & Powell, T., (2014). Capabilities, crowds and chaos. Oxford University working paper.
- Fernandez, R.M, Castilla, E.J., & Moore, P., (2000). Social capital at work: Network and employment at a phone center. *American Journal of Sociology*, 105, 1288-1356.

- Fernandez, R.M., & Weinberg, N. (1997). Sifting and sorting: Personal contacts and hiring in a retail bank. *American Sociological Review*, 62, 883-902.
- Flyvbjerg, B. (2009). Survival of the unfittest: Why the worst infrastructure gets built—and what we can do about it. *Oxford Review of Economic Policy*, 25, 344-367.
- Franke, N., Poetz, & Schreier, M. (2013). Integrating problem solvers from analogous markets in new product ideation. *Management Science*, 60, 1063-1081.
- Foss, N. (2003). Selective intervention and internal hybrids: Interpreting and learning from the rise and decline of the oticon spaghetti organization. *Organization Science*, 14, 331-349.
- Gilbert, D. T. & Malone, P. S. (1995). The correspondence bias. *Psychological Bulletin*, 117 (1): 21–3
- Gigerenzer, G. (2014). *Risk savvy: How to make good decisions*. Penguin Publishing.
- Goffman, E. (1959). *Presentation of self in everyday life*. Anchor Press.
- Goldstein, D.G., Johnson, E.J., Herrmann, A., & Heitmann, M. (2008). Nudge your customers toward better choices. *Harvard Business Review*, 99-105.
- Granovetter, M. (1995). *Getting a Job: A Study of Contacts and Careers*. University of Chicago Press.
- Hall, C.C., Ariss, L., & Todorov, A. 2007. The illusion of knowledge: When more information reduces accuracy and increases confidence. *Organizational Behavior and Human Decision Processes*, 103, 277-290.
- Hayton, J.C. (2005). Promoting corporate entrepreneurship through human resource management practices: A review of empirical research. *Human Resource Management Review*, 15, 21-41.
- Hayton, J.C., Piperopoulos, P., & Welbourne, T.M. (2011). 50 years of knowledge sharing: Learning from a field moving forward. *Human Resource Management*, 50, 697-714.
- Heath, C., & Gonzalez, R. (1995). Interaction with others increases decision confidence by not decision quality: Evidence against information collective views of interactive decision making. *Organizational Behavior and Human Decision Processes*, 61, 305-326.
- Heath, C., Larrick, R.P., & Klayman, J. (1998). Cognitive repairs: how organizational practices can compensate for individual shortcomings. *Research in Organizational Behavior*, 20, 1-37.
- Heath, C., and Sitkin, S. (2001). Big-B versus big-O: What is organizational about organizational behavior. *Journal of Organizational Behavior*, 2, 43–58.
- Heath, C., & Staudenmayer, N. (2000). Coordination neglect: how lay theories of organizing complicate coordination in organizations. *Research in Organizational Behavior*, 22, 153-191.
- Hekman, D.R., Aquino, K., Owens, B.P., Mitchell, T.R., Shilpzand, P., Leavitt, K. (2010). An examination of whether and how racial and gender bias influence customer satisfaction. *Academy of Management Journal*, 53, 238-264.
- Herring, C. (2009). Does diversity pay? Race, gender, and the business case for diversity. *American Sociological Review*, 74, 208-224.

- Hilbert, M. (2012). Toward a synthesis of cognitive biases: How noisy information processing can bias human decision making. *Psychological Bulletin*, 138, 211-237.
- Hoffman, DD., & Singh, M. (1997). Salience of visual parts. *Cognition*, 63, 29-78.
- Hoorens, V. (1993). Self-enhancement and superiority biases in social comparison. *European Review of Social Psychology*, 4, 113-139.
- Hodgkinson, G.P., Brown, N.J., Maule, A.J., Glaister, K.W., & Pearman, A.D. (1999). Breaking the frame: An analysis of strategic cognition and decision making under uncertainty. *Strategic Management Journal*, 20, 977-985.
- Hodgkinson, G.P., & Healey, M.P. (2011). Psychological foundations of dynamic capabilities: Reflexion and reflection in strategic management. *Strategic Management Journal*, 32, 1500-1516.
- Hofmann, W., Rauch, W., & Gawronski, B. (2007). And deplete us not into temptation: Automatic attitudes, dietary restraint, and self-regulatory resources as determinants of eating behaviour. *Journal of Experimental Social Psychology*, 43, 497-504.
- Hofmann, W., Baumeister, R.F., Förster, G., & Vohs, K.D. (2012). Everyday temptations: An experience sampling study of desire, conflict, and self-control. *Journal of Personality and Social Psychology*, 102, 1318-1335.
- Ingram, P., & Morris, M.W. (2007). Do people mix at mixers: Structure, homophily, and the life of the party. *Administrative Science Quarterly*, 52, 558-585.
- Johns, G. (2006). The essential impact of context on organizational behavior. *Academy of Management Review*, 31, 386-408.
- Jackson, S.E., Schuler, R.S., & Jiang, K. (2014). An aspirational framework for strategic human resource management. *Academy of Management Annals*, 8, 1-56.
- Johnson, E.J., Shu, S.B., Dellaert, B.C.G., Fox, C. (2012). Beyond nudges: Tools of a choice architecture. *Marketing Letters*, 23, 487-504.
- Jolls, C., Sunstein, C.R., & Thaler, R. (1998). A behavioral approach to law and economics. *Stanford Law Review*, 50, 1471-1550.
- John, P. (2013). Nudge, nudge, think, think: Experimenting with ways to change civic behavior. Bloombury.
- Jost, J.T. & Banaji, M.R. (1994). The role of stereotyping in system-justification and the production of false consciousness. *British Journal of Social Psychology*, 33, 1-27.
- Keeney, R.L. (1992). Value-focused thinking: A path to creative decisionmaking. Harvard University Press.
- King, B., Felin, T., and Whetten, D. (2010). Finding the organization in organization theory: A meta-theory of the organization as social actor. *Organization Science*, 21, 290–305.
- Knudsen, T., & Levinthal, D. (2010). Two faces of search: Alternative generation and alternative evaluation. *Organization Science*, 21, 1016-1033.
- Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessment. *Journal of Personality and Social Psychology*, 77, 1121-1134.

- Krueger, J., (1998). Enhancement bias in descriptions of self and others. *Personality and Social Psychology Bulletin*, 24, 505-516.
- Krueger, J.I., (2011). *Social judgment and decision making*. Psychology Press.
- Krueger, J.I., (2009). Rationality restored: An introduction to the special issue. *Social Cognition*, 27, 635-638.
- Landy, F. J. (2008). Stereotypes, bias, and personnel decisions: Strange and stranger. *Industrial and Organizational Psychology: Perspectives on Science and Practice*, 1, 379–392.
- Latane, B., & Darley, J.M. (1970). *The unresponsive bystander*. New York: Prentice Hall.
- Latane, B., Williams, K., & Harkins, S. (1979). Many hands make light the work. The causes and consequences of social loafing. *Journal of Personality and Social Psychology*, 37, 822-832.
- Lerner, J.S., & Tetlock, P.E. (1999). Accounting for the effects of accountability. *Psychological Bulletin*, 125, 255-275.
- Lewis, M. (2004). *Moneyball: The art of winning an unfair game*. New York, NY: W.W.Norton.
- Locke, E. A. (2005). Why emotional intelligence is an invalid concept. *Journal of Organizational Behavior*, 26, 425–431.
- Litov, L.P., Moreton, P., & Zenger, T.R. (2012). Corporate strategy, analyst coverage, and the uniqueness paradox. *Management Science*, 58, 1797-1815.
- Ly, K., Mazar, N., Zhao, M., & Soman, D. (2013). *A Practitioner’s Guide to Nudging*. Research Report Series: Behavioral Economics in Action. Rotman School of Management, University of Toronto.
- Marlowe, C.M., Schneider, S.L., & Nelson, C.E. (1996). Gender and attractiveness biases in hiring decisions: Are more experience managers less biased? *Journal of Applied Psychology*, 81, 11-21.
- Marsh, D.R., Schroeder, D.G., Dearden, K.A., Sternin, J., & Sternin, M. (2004). The power of positive deviance. *British Medical Journal*, 329, 1177-1179.
- McCaffrey, T. 2012. Innovation relies on the obscure: A key to overcoming the classic problem of functional fixedness. *Psychological Science*, 23, 215-218.
- Mischel, W., Ebbesen, E., Raskoff, Z. (1972). Cognitive and attentional mechanisms in delay of gratification. *Journal of Personality and Social Psychology*, 21, 204-218.
- Moore, D.A., & Flynn, F.J. (2008). The case for behavioral decision research in organizational behavior. *Academy of Management Annals*, 2, 399-431.
- McDaniel, M. A., Whetzel, D. L., Schmidt, F. L., & Maurer, S. D. (1994). The validity of employment interviews: A comprehensive review and meta-analysis. *Journal of Applied Psychology*, 79, 599–616.
- McKenzie, C. R., Liersch, M. J., & Finkelstein, S. R. (2006). Recommendations implicit in policy defaults. *Psychological Science*, 17(5), 414-420.
- McPherson, M., Smith-Lovin, L., & Cook, J.M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology*, 27, 415-444.

- Milkman, K. L., Rogers, T. & Bazerman, M. H. (2010). I'll have the ice cream soon and the vegetables later: A study of online grocery purchases and order lead time. *Marketing Letters*, 21(1), 17-36.
- Moore, D.A. & Healy, P.J. (2008). The trouble with overconfidence. *Psychological Review* 115: 502-517.
- Moore, D.A. (2007). Not so above average after all: When people believe they are worse than average and its implications for theories of bias in social comparison. *Organizational Behaviour and Human Decision Processes*, 102, 42–58.
- Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology*, 2, 175–220.
- Nickerson, R.S. (1999). How we know—and sometimes misjudge—what others know: Imputing one's own knowledge to others. *Psychological Bulletin*, 125, 737-759.
- Nickerson, J., & Zenger, T. (2008). Envy, comparison costs, and the economic theory of the firm. *Strategic Management Journal* 29, 1371-1394.
- Nishii, L., (2012). The benefits of climate for inclusion for gender diverse groups. *Academy of Management Journal*, 56, 1754-1774.
- Oreg, S., & Bayazit, M. (2009). Prone to bias: Development of a bias taxonomy from an individual differences perspective. *Review of General Psychology*, 13, 175-193.
- Page, S. (2007). *The difference: How the power of diversity creates better groups, firms, schools and societies*. Princeton University Press.
- Patel, L. (2010). *ASTD State of the industry report 2010*. Alexandria, VA: American Society for Training & Development.
- Pfeffer, J., & Sutton, R.I. (2006). *Evidence-based management*. Harvard Business Review.
- Ployhart, R.E. (2012). The psychology of competitive advantage: An adjacent possible. *Industrial and Organizational Psychology*, 5, 62-81.
- Ployhart, R. E., Nyberg, A.J., & Maltarich, M.A. (2014). Human capital is dead; Long live human capital resources! *Journal of Management*, 40, 371-398.
- Pronin, E., Lin, D.Y., Ross, L. (2002). The bias blind spot: Perceptions of bias in self versus others. *Personality and Social Psychology* 28, 369-381.
- Pope, D., & Schweizer, M.E. (2011). Is tiger woods loss averse? *American Economic Review* 101: 129-157.
- Powell, T., Lovallo, D & C.R. Fox. (2011). Behavioral strategy. *Strategic Management Journal*, 32(13), 1369-1386.
- Rousseau, D. M., Manning, J., & Denyer, D. (2008). Evidence in management and organizational science: Assembling the field's full weight of scientific knowledge through reflective reviews. *Academy of Management Annals*, 2, 475–515.
- Rousseau, D.M. (2012). *The oxford handbook of evidence-based management*. Oxford University Press.

- Ross, M., & Sicoly, F. (1979). Egocentric biases in availability and attribution. *Journal of Personality and Social Psychology*, 37, 322-336.
- Rubineau, B., & Fernandez, R.M. (2013). Missing links: Referrer behaviour and job segregation. *Management Science*, 59, 2470-2489.
- Rynes, S. L., Brown, K. G., & Colbert, A. E. (2002). Seven common misconceptions about human resource practices: Research findings versus practitioner beliefs. *Academy of Management Executive*, 16, 92-103
- Salas, E., Tannenbaum, S.I., Kraiger, K., & Smith-Jentsch, K.A. (2012). The science of training and development in organizations: What matters in practice. *Psychological Science in the Public Interest*, 13, 74-101.
- Sah, R. K., and Stiglitz, J. E. (1986). The architecture of economic systems: Hierarchies and polyarchies. *American Economic Review*, 76, 716-727.
- Schneider, B. (1987). The people make the place. *Personnel Psychology*, 40, 437-454.
- Schkade, D.A., & Kahneman, D. (1998). Does living in California make people happy? A focusing illusion in judgments of life satisfaction. *Psychological Science*, 9, 340-346.
- Schwed, R., & Kalev, A. (2014). Are referrals more productive or more likeable? Social networks and the evaluation of merit. *American Behavioral Scientist*, 58, 288-308.
- Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science*, 18(5), 429-434.
- Shafir, E., & LeBoeuf, R.A. (2002). Rationality. *Annual Review of Psychology*, 53, 491-517.
- Shafir, E. (2012). *The behavioural foundations of public policy*. Princeton University Press.
- Sharon, G., & Mizzi, T. (2014). Body weight bias in hiring decisions: Identifying explanatory mechanisms. *Social Behavior and Personality*, 42, 353-370.
- Sherif, M., Hovland, C.I. (1961). *Social judgment: Assimilation and contrast effects in communication and attitude change*. Yale University Press.
- Simon, H. (1955). A behavioural model of rational choice. *Quarterly Journal of Economics*, 69, 99-118.
- Sloman, S.A. (1996). The empirical case for two systems of reasoning. *Psychological Bulletin*, 119, 3-22.
- Sobal J., & Bisogni, C.A. (2009). Constructing food choice decisions. *Annals of Behavioral Medicine*, 38, 36-47.
- Soll, J.B., Milkman, K.L. & Payne, J.W. (2013). *A user's guide to debiasing*.
- Staats, B.R., Milkman, K.L., & Fox, C.R. (2012). The team scaling fallacy: Underestimating the declining efficiency of larger teams. *Organizational Behavior and Human Decision Processes*, 118, 132-142.
- Stanovich, K.E. (2011). *Rationality and the reflective mind*. Oxford University Press.

- Stanovich, K. E., & West, R. F. (2000). Individual differences in reasoning: Implications for the rationality debate?. *Behavioral and Brain Sciences*, 23(5), 645-665.
- Stanovich, K. E., & West, R. F. (2008). On the relative independence of thinking biases and cognitive ability. *Journal of Personality and Social Psychology*, 94(4), 672-695.
- Stinchcombe, A. (1990). *Information and organizations*. University of California Press.
- Swift, S.A., Moore, D.A., Sharek, Z.S., & Gino, F. 2013. Inflated applicants: Attribution errors in performance evaluation by professionals. *PLoS one*.
- Suls, J., K. Lemos, H.L. Stewart (2002). Self-esteem, construal, and comparisons with the self, friends and peers. *Journal of Personality and Social Psychology*, 82(2), 252–261.
- Sunstein, C.R. (2014a). Nudges versus shoves. *Harvard Law Review Forum*, forthcoming.
- Sunstein, C.R., (2014b). Choosing not to choose. Harvard public law working paper.
- Tai, K., Zheng, X., & Narayanan, J. (2011). Touching a teddy bear mitigates negative effects of social exclusion to increase prosocial behavior. *Social Psychological and Personality Science*, 2, 618-626.
- Tetlock, P.E. (2000). Cognitive biases and organizational correctives: Do both disease and cure depend on the politics of the beholder? *Administrative Science Quarterly*, 45, 293-326.
- Thaler, R. H., & Benartzi, S. (2004). Save more tomorrow™: Using behavioral economics to increase employee saving. *Journal of Political Economy*, 112(S1), S164-S187.
- Thaler, R.H., & Sunstein, C. (2008). *Nudge: Improving decisions about health, wealth and happiness*. Yale University Press.
- Thaler, R.H., Sunstein, C.R., & Balz, J.P. (2013). Choice architecture. SSRN working paper.
- Thomas, K.A., DeScioli, P., Haque, O.S., & Pinker, S. 2014. The psychology of coordination and common knowledge. *Journal of Personality and Social Psychology*, 107, 657-676.
- Todd, A.R., Hanko, K., Galinsky, A.D., & Mussweiler, T. 2011. When focusing on differences leads to similar perspectives. *Psychological Science*, 22, 134-141.
- Todd, P.M., & Gigerenzer, G. (2003). Bounding rationality to the world. *Journal of Economic Psychology*, 24, 143-165.
- Tormala, Z.L., Jia, J.S., & Norton, M.I. (2012). The preference for potential. *Journal of Personality and Social Psychology*, 103, 567-583.
- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185, 1124-1131.
- Valve Corporation, (2012). *Handbook for New Employees*, First Edition, March, 2012.
- Vohs, K.D., Baumeister, R.F., Schmeichel, B.J., & Twenge, J.M. (2008). Making choices impairs subsequent self-control: A limited-resource account of decision-making, self-regulation, and active initiative. *Journal of Personality and Social Psychology*, 94, 883-898.

- Waytz, A., Gray, K., Epley, N., & Wegner, D. (2010). Causes and consequences of mind perception. *Trends in Cognitive Sciences*, 14, 383-388.
- Whetten, D., Felin, T., & King, B. (2009). The practice of theory borrowing in organizational studies: Current issues and future directions. *Journal of Management*, 35, 537–563.
- Whyte, K.P., Selinger, E., Caplan, A.L., & Sadowski, J. (2012). Nudge, nudge or shove, shove—the right way for nudges to increase the supply of donated cadaver organs. *American Journal of Bioethics*, 12, 32-39.
- Williams, L.E. & Bargh, J.A. (2008). Experiencing physical warmth promotes interpersonal warmth. *Science* 322: 606-607.
- Wolfe, R., Wright, P.M., & Smart, D.L. (2006). Radical HRM innovation and competitive advantage: The moneyball story. *Human Resource Management*, 45, 111-145.
- Wolfers, J. & Zitzewitz, E. (2004). Prediction markets. *Journal of Economic Perspectives* 18, 107–26.
- Yaniv, I., & Milyavsky, M. (2007). Using advice from multiple sources to revise and improve judgments. *Organizational Behavior and Human Decision Processes*, 103(1), 104-120.