Decentralization Mislaid: On New Paternalism and Skepticism toward Experts

Nathan Berg*

Department of Economics, University of Otago, PO Box 56, Dunedin 9054, New Zealand and University of Newcastle, Australia; nathan.berg@otago.ac.nz

ABSTRACT

The goal of making people better off "by their own standard" in the New Paternalism research program of Thaler-and-Sunstein-inspired "nudging" raises a number of theoretical and practical risks. Some of these risks are straightforward. Others are subtle. I enumerate rarely acknowledged risks that nudging programs face based on informational loss, forgone individual payoffs, and social welfare losses. This essay draws on neoclassical information economics, social welfare theory, and the methodological literature on normative behavioral economics to focus on experts who propose policies based on New Paternalism and the apparently unforeseen social costs that their policies may impose.

What is the socially optimal intensity of skepticism toward choice architects? Zero skepticism cannot be social-welfare maximizing insofar as voters' skepticism serves an important role in the political economy of disciplining political power. At the other extreme, maximal skepticism is unlikely to be social-welfare maximizing because it wastes good information that uninformed voters and politically appointed experts would both like to be transmitted and acted upon. Therefore, the socially optimal intensity of skepticism is a strictly interior value somewhere between zero and maximal.

Because there is risk of other non-transparent objectives (e.g., lobbying) influencing paternalistic choice architecture, one of its first-order effect is to increase skepticism. As policy makers impose increasingly aggressive policy experiments in choice architecture under the cover of social science (behavioral economics, in this

case), the political economy shifts down a slippery slope along which individual response functions (e.g., updating of subjective beliefs) rationally select increasingly skeptical views of expert advice and government speech.

Social costs from information loss and reduced coordination services (that would otherwise have been achieved by decentralization without choice architecture) suggest a more cautionary approach to policy and regulation. New Paternalism risks rationalizing increased skepticism which, in its limit, can rationalize conspiracy theories about shrouded objectives influencing choice architects.

Keywords: Skepticism, Expert, Information, Nudge, Neoclassical rationality, Ecological rationality

JEL Codes: D8, I00, H1, G4, P00

"When it becomes serious, you have to lie." — Jean-Claude Juncker (2011)

1 Overview

I focus on a situation in which one agent, whom I refer to as the *expert*, has more information than a *non-expert*. The expert's informational superiority is a maintained assumption throughout. Furthermore, I assume that the expert's informational superiority is accepted as an objective fact by both expert and non-expert alike. The issue at hand is to investigate conditions under which information transmitted by the expert can be believed. The non-expert knows that the expert possesses a set of information which, if transmitted transparently (i.e., without selectively excluding parts of the expert's private information, shading or distorting), would (in expectation) enable the non-expert to improve his payoffs.

Berg and Kim's (forthcoming 2019) model provides motivation for this analysis. They characterize good and bad communication equilibria in an extension of Crawford and Sobel (1982) model. In Berg and Kim (forthcoming 2019), an expert advisor possesses information about the non-expert's objective function, which the non-expert himself does not know and would benefit from knowing if he could reliably learn it from the expert. The non-expert therefore understands that the expert's expertise is genuine. He is not sure, however, whether the expert faithfully transmits her private information to non-experts or instead paternalistically influences the non-expert to choose a different action from his true optimal action. In other words, the non-expert advisee faces uncertainty regarding the expert's type: one type of non-paternalistic

expert takes the non-expert's true objective seriously; another type of expert is paternalistic and transmits information with distortion or non-neutral filtering.

Berg and Kim (forthcoming 2019) show that the expert can take an action prior to transmitting her private information to signal that she is a non-paternalistic expert and therefore that her information can be believed. Non-paternalistic experts who successfully signal their type thereby enable transparent communication as an equilibrium outcome characterized by full informational efficiency. With further assumptions about the costs of signalling, the informationally efficient *good communication equilibrium* can be Pareto-superior to the bad communication equilibria in which experts paternalistically distort, exaggerate, strategically frame, or selectively exclude other contextualizing information unavailable to non-experts.

Even when non-experts want to trust what experts say and act on information they provide, Berg and Kim's model shows that a good communication equilibrium is rather special and likely to be fragile with respect to nudging. Costly sacrifices by experts are required in order for non-experts to believe them as non-paternalists. In such a context, avoiding nudges as an approach to government policy—and leaving plenty of room for private information transmission, heterogeneous belief formation, heterogeneous behaviors, and decentralization of interpretation and filtering of information—could go a long way toward avoiding the waste of information and social welfare that results from getting stuck in a bad communication equilibrium.

One "extreme" case of non-expert interpretation or filtering of the information that experts disseminate could mean ignoring what an expert says. Ignoring experts could turn out to be either irrational or rational, depending on whether the expert is distorting her message. A good communication equilibrium may therefore prove elusive in the sense that there are many bad communication. Heterocultures of belief, action and information transmission can help avoid the waste of information and social welfare resulting from well-intentioned paternalism.

Sin taxes are an example of a paternalistic policy advocated by many behavioral economists (and presumably non-behavioral economists, too, e.g., public health experts). According to Thaler and Sunstein's definition of a nudge, sin taxes should not be regarded as nudges because they change the decision maker's choice set (and similarly for policies that subsidize behavior that paternalistic experts seek to induce). While sin taxes may not be "nudges," they do comfortably fit under the umbrella of "New Paternalism", which takes behavioral economics as a new source of rationalizations of paternalism (Rizzo and Whitman, 2009). A problem with sin taxes is that (like many policies) they can paradoxically induce the opposite behavioral response as their designers intended while incurring large social costs (e.g., low-income smokers responding to tobacco taxes by reducing expenditures on nutrition). The substitution story is straightforward. The informational loss in the bad communication

equilibrium mentioned above is less obvious. And there are more subtle costs whose magnitudes may be substantial in the list of unacknowledged risks of nudging enumerated in the next section.

Section 2 presents an eclectic list of problems with public policies guided by New Paternalism which call for state intervention to reduce alleged irrationalities based on "findings from behavioral economics." Section 3 investigates skepticism toward experts and governments, allowing for the possibility of both social costs *and* benefits. Section 4 contains a concluding discussion drawing on Epstein (1995; 1998; 2003; 2011; 2014) to argue that the basic insights about the social benefits of decentralization, which conflict with New Paternalism's normative claims, risks being mislaid.

2   Risks of Nudging and New Paternalism

2.1   *Correcting Behavior Inconsistent with Consistency Axioms can Lower Payoffs*

Proponents of the *biases program* on which New Paternalism is founded typically define rationality as an absence of inconsistencies with respect to a list of axioms requiring internal logical consistency (e.g., transitive preferences, risk preferences that satisfy the Savage axioms, Bayesian belief updating, time-consistent discounting rates). Consistency axioms allow for a large set of internally consistent behavioral rules (i.e., solutions to a constrained optimization problem).

There was a major shift regarding whether behavioral economics should be interpreted as descriptive or normative when comparing Thaler's (1991) *Quasi Rational Economics*) and Thaler and Sunstein's (2008) *Nudge*). In 1991, Thaler assures readers that behavioral economics can be interpreted as purely descriptive and that its normative framework is virtually the same as that of neoclassical economics.[1] In 2008, however, Thaler and Sunstein argue that behavioral economics is rich with "policy implications."

Thaler (1991) encourages us to think of violations of axiomatic consistency as analogous to optical illusions. In the analogy he proposes, axiomatic rationality (i.e., behavior patterns or individual choice data that satisfy internal consistency) is associated with objective units of physical measure, namely, measures of physical distance (e.g., metres). This unhelpful analogy is invalid for several reasons, the most obvious being that—unlike an optical illusion where perceived distance can be corrected by a single, well-defined standard

---

[1] Thaler (1991, p. 138) asserts: "A demonstration that human choices often violate the axioms of rationality does not necessarily imply any criticism of the axioms of rational choice as a normative idea. Rather, the research is simply intended to show that for descriptive purposes, alternative models are sometimes necessary."

of accuracy—there is no single choice behavior that is maximally rational in Thaler's analogy (i.e., no single way for 'behavioral deviations from consistency axioms' to be corrected).

From Berg's "Normative Behavioral Economics":

> Thaler (1991, p. 138) argues that the major contribution of behavioral economics has been the discovery of a collection of "illusions," completely analogous to optical illusions. Thaler interprets these "illusions" as unambiguously incorrect departures from the "rational" or correct way of making decisions. Thaler is explicit in accepting neoclassical axioms of individual preferences (e.g., transitivity, completeness, non-satiation, monotonicity, and the Savage axioms which guarantee that preferences over risky payoffs can be represented by an expected utility function) as his normative ideal when he writes: 'It goes without saying that the existence of an optical illusion that causes us to see one of two equal lines as longer than the other should not reduce the value we place on accurate measurement. On the contrary, illusions demonstrate the need for rulers!'

> Yet, in showing that human decisions contradict the predictions of expected utility theory, there is no analogue to the straight lines of objectively equal length. Unlike the simple geometric verification of equal lengths against which incorrect perceptions may be verified, the fact that human decisions do not satisfy the axioms underlying expected utility theory in no way implies an illusion or a mistake. Expected utility theory is, after all, but one model of how to rank risky alternatives . . .

> — Berg (2003)

The axiomatic standard of consistency is both "promiscuous" in admitting many patterns of behavior that satisfy axiomatic rationality and overly *restrictive*, ruling out many inconsistent behavior patterns that perform well in the real world where the exogenous reward-generating environment is often complex and unstable. Thus, behavioral anomalies reported in the behavioral economics literature do indeed violate a well-defined standard of internal axiomatic consistency. But that standard does not tell us what we should do.

There are many ways of being internally consistent (e.g., consistently patient, consistently impatient; consistently risk-averse, consistently risk-accepting; etc.). And because there are many ways of being rational (by the axiomatic definition), the analogy associating inconsistent choice rules with optical illusions is misleading because it implies that axiomatic consistency provides an objective normative standard equivalent in some sense to objective accuracy in the perception of physical distance. Nudges do not "correct"

mistaken behavior by returning them to a high level of performance based on well-defined unit of measure.

When nudgers say that people should eat less, exercise more, or save more for retirement, they are arguing that the nudge provides a crutch that "improves rationality" based on inducing (a greater degree of) internal consistency with what people actually want. Nudgers implicitly define rationality as internal logical consistency—following the technical requirements on ordinal preferences that were developed originally for utility representation theorems and, subsequently, interpreted by behavioral economists as domain-general requirements for human rationality. Unlike measurement of physical distance where there is a clear objective standard for measuring how accurate perceived distances are, there are infinitely many ways to conform perfectly consistency axioms and satisfy axiomatic definitions of rationality (borrowed from neoclassical economics).

Nudges are promoted as restoring rationality merely by reducing internal inconsistencies with a person's multiple selves or among multiple preferences. Nudges are promoted as a means of shifting behavior in the direction of internal logical consistency, without necessarily achieving substantive improvements measured in metrics of human performance that humans (aside from proponents of New Paternalism) find compelling.

There is a substantial literature showing domains of choice and inference in which systematic deviations from axiomatic rationality can generate improvements in own payoffs (e.g., Berg and Hoffrage, 2008, 2010; Bookstaber and Langsam, 1985; Gigerenzer *et al.*, 1999, Todd *et al.*, 2012; Hertwig *et al.*, 2013). Perhaps as a rhetorical work-around, parts of the behavioral economics literature aligned with the New Paternalism program have focused on documenting biases with respect to axiomatic definitions of rationality and interpreting those findings as evidence of irrationality and widespread decision-making pathology without doing much (if any) work to substantiate the economic costs (or benefits) they generate. That deviations from axiomatic rationality "must be costly" is an auxiliary and largely unexamined assumption in many studies in this literature.

Thousands of behavioral economics papers report damning rates of "irrational" behavior (i.e., internally inconsistent) *without* even reporting mean payoffs contrasting the payoff performance of rational versus irrational types (Berg and Gigerenzer, 2010; Berg, 2014b). For all the unfair criticism by non-economists of economists' narrow focus on money, it is astonishing how little attention the literature on behavioral anomalies has given to investigating their costs (e.g., reporting mean contrasts breaking out mean earnings, wealth, health, happiness, etc., in the axiomatically consistent versus inconsistent subsamples).

Documenting instances of logical inconsistency has crowded out careful analysis of the costs (and benefits) of logically inconsistent decision rules—

whether these are compared by the metrics of mean payoffs, income, wealth, lifespan, self-reported happiness, numbers of friends, etc.[2] More specificity about the costs and benefits of inconsistent behavior and mores straightforward justification of any performance metrics invoked would be helpful. Doing so would at least help focus New Paternalists' nudging program on settings where the costs of inconsistency has been demonstrated—and avoid unwittingly harming high levels of performance generated by inconsistent behavior rules in the domains where they perform well (cf. Caplan's [2000] analysis of a 'rationally irrational' individual who optimally allocates irrationality in domains where it is least costly).

2.2 Costly "Biases" can Improve Aggregate Payoffs

Systematic deviations from axiomatic rationality can, across a surprisingly wide class of decision domains (or environments), generate Pareto improvements (i.e., increases in aggregate payoffs or wellbeing). Although there are individual costs to having biased beliefs (in some models), biased beliefs can provide a market-wide liquidity improvement that more than offsets their costs. This finding holds even in relatively orthodox models of financial market microfoundations with no exotic preferences or pro-social motives—where subjective beliefs deviate from objective frequencies and are indeed individually costly. A heterogeneous ecology of subjective beliefs (comprised of *mostly* false subjective beliefs) can confer important social benefits (Arthur, 1994; Berg and Lien, 2005; Berg and Gigerenzer, 2007; Gintis, 2007). To intervene, to de-bias, or to nudge in the direction of fewer (or less severe) behavioral anomalies in models such as these would risk perpetuating an aggregate-payoff-decreasing shift from Pareto-superior to Pareto-inferior allocations or action profiles.

2.3 Nudging Toward Axiomatic Rationality may Reduce Payoffs

Following Lancaster's theory of the second best, another normative problem with the nudge program arises in its claims that inducing people to move 'in the direction' of axiomatic rationality will be helpful. If a nudge does not succeed at fully shifting logically inconsistent behavior to achieve *perfect* axiomatic consistency, why are we confident that payoffs should improve by merely shifting in that direction? If a nudge does induce *more* behavioral consistency, then we should worry (following Lancaster's analysis) that 'somewhat more consistent' behavior induced by the nudge may leave the individual worse off. Without guaranteeing that the nudge succeeds at achieving fully

---

[2]See Binder (2010) and Binder (2013) for further critique of paternalism from a happiness perspective; Bruni and Porta (2007) regarding subtleties and multi-dimensionality of happiness; and Khalil (2017) for a rational choice interpretation of Adam Smith's 'sympathy' and pro-social preferences.

optimal behavior in a given domain, the important theoretical possibility remains that moving an individual who deviates *in the direction of optimization* may make him or her worse off, as the following trivial example demonstrates.

Consider an agent choosing a triple x, whose veridical (not small-world) payoff function is $u(x) = x_1^{0.89} x_2^{0.10} x_3^{0.01}$. Boundary solutions achieve minimum utility (zero) and can therefore be ruled out. The first-order conditions for an interior optimum require equating marginal rates of substitution with price ratios, which (given Cobb-Douglas utility) implies allocating expenditures with the following expenditure ratios: 0.89: 0.10: 0.01.

Suppose that the agent uses a '$1/N$' heuristic by allocating equal expenditure to each of the three goods regardless of their prices, violating all first-order conditions ($MRS_{ij} \neq p_i/p_j$) for all $i \neq j$, $i, j \in 1, 2, 3$). In this setup, failure to optimize is costly and easy to verify.

Now suppose a nudger enacts a policy that induces partial conformity with the first-order conditions. Suppose the nudge succeeds at inducing the agent to satisfy one of the first-order conditions (which I interpret as nudging the agent *toward* rationality[3]): an optimal ratio of expenditures, $p_2 x_2 / p_2 x_3 = 10$. There are many ways to respect *one* first-order condition that give lower utility than the $1/N$ heuristic does. Suppose, for example, the agent spends her entire budget on goods 2 and 3 in the correct ratio, leaving zero units of x_1; after the nudge to respect first-order conditions, she now achieves minimal (zero) utility, despite having responded to the nudge in the desired direction. The agent would have been better off continuing to use the heuristic rather than following a nudge that induces *partial* conformity with optimization conditions.

It is trivial demonstration. But the relevance of the point to the nudge program is worth emphasizing. The choice problems that regulated citizens face are so radically heterogeneous that there is little hope for a nudger, in general, to be sure if "nudging people to more closely conform with axiomatic rationality" winds up achieving a net gain or loss in payoffs. In general, we do not know the answer to this question. Therefore, a social-welfare-maximizing government might reasonably choose to generally avoid engaging in nudges, given that they can (and perhaps likely to) induce more harm than good.

---

[3]A nudger might object that nudges, by definition, seek to improve payoffs and therefore "satisfying one more first-order condition" is not a nudge. This objection raises the spectre of tautological reasoning, however. If a policy intervention must raise payoffs in order to be a "nudge," then nudges can never fail to raise payoffs (by definition). Unsuccessful attempts are not nudges. Successful ones are.

Among the ways we might try to help this agent raise her payoffs, one (possibly) reasonable way would be to recommend satisfying the first-order conditions. If a nudge only gets her part of the way toward perfect optimization, then the nudge *may* have hurt her payoffs.

2.4   Lost Benefits of Heterogeneous 'Ecologies' of Belief and Action

When considering benefits and costs of pursuing New Paternalism policy making, the benefits of heterogeneity itself are worth considering. If the goal of the policy is to induce as many people to follow the recommended behavior as possible, then it stands to reason that the policy's end goal would reduce some forms of heterogeneity. Insofar as government nudges are successful at influencing a population to conform more strictly to a profile of beliefs and behavioral targets that experts deem to be "best," "optimal on average," or "optimal for the average person," then we can also expect that heterogeneity of beliefs and heterogeneity of behavior to decline. Included among the risks of the nudging program is that more homogeneity in thinking and behavior could lead to fewer discoveries, lower rates of innovation, and more psychological hardship among those with unusual or outlier points of view (even though there may be a smaller number of such individuals if the nudging program succeeds in achieving its goals).

One example of heterogeneous behavior providing valuable new information would be epidemiological findings suggesting some benefits from moderate alcohol consumption published in recent decades. Had the prohibition movement employed potent nudging technology to achieve (nearly) universal non-drinker status, that information may never have been discovered. Heterogeneous belief formation, heterogeneous procedures for making inferences and the portfolio diversification benefits of heterogeneous behavioral profiles are all potentially at risk if New Paternalism succeeds at reducing individual heterogeneity.

Given the role that inductive versus deductive reasoning plays in creative endeavors and philosopher Philip Kitcher's observations about the valuable capacity of innovative thinkers to hold inconsistent thoughts as a pre-cursor to scientific discovery, the New Paternalist's goal of reducing inconsistency of beliefs and behavior writ large may carry other unanticipated risks and costs at both the individual and species levels. The species-level biological benefit of heterogeneity itself is analyzed by Bookstaber and Langsam (1985).

A close variant of the benefits of heterogeneity are the vulnerabilities of monocultures (i.e., reduced robustness). Although it may frustrate experts that they are not able to persuade higher rates of conformity with recommendations on nutrition, retirement savings and the like, the nudging program might do well to reflect on the social benefits that those who resist nudges toward monoculture provide. Heterogeneity affords greater rates of discovery and new understandings regarding what constitutes best practices. Heterogeneity also helps avoid harm through portfolio diversification whenever current best practices are found out to be wrong.[4]

---

[4]Do we really wish that potent nudge policies such as 'Save More Tomorrow' to induce greater exposure to risky equity markets had been put in place in Japan during the 1980s during the long run-up to the NIKKEI's peak in 1989 (trading in recent months of 2018

A heterogeneous ecology of conflicting beliefs and behaviors (both inter- and intra-personally) enables discovery of best practices where "best "can be directly linked to one or more clearly defined performance metrics. Normative behavioral economics (Berg, 2003) could use this heterogeneity to investigate *which* decision processes used in *which* domains achieve long lifespans, adequate financial wealth, happiness. It would seem prudent to at least wait for empirical evidence showing how an individual's portfolio of decision-making processes is associated with multiple performance metrics before undertaking nudging programs aimed at reducing behavioural heterogeneity.

2.5   Reduced Transmission of Valuable Information

See Berg and Kim (forthcoming 2019).

2.6   Reduced Payoffs from Reduced Transmission of Information

Reduced information flow and reduced payoffs from reduced information flow are conceptually distinct (although equivalent for many types of analysis).

2.7   Cognitive Burden from Increased Complexity of Government Communication

As shown below, nudging introduces complexity and shifts the communication game between non-experts and government to one with higher-dimensional, more sophisticated communicative action sets.

2.8   Reduced Wellbeing from Increased Complexity

"Increased complexity" here refers to the communication games that a nudging government forces everyone to play. Greater complexity requires more effort in filtering and interpreting the information that governments engaged in nudging provide. When implementing a nudging policy, the government changes the way in which it transmits information. A government that is credibly believed to not engage in nudging may simply transmit information it gathers. In contrast, a nudging government bundles information it transmits together with implicit or explicit communication strategies designed to exert influence over the population's behavior. It is far from unimaginable that the complexity of information bundled together with paternalistic communication leads to new

---

at a little over 50% of its 1989 peak)? Given that expert consensus about 'best practices' frequently changes (e.g., in high-stakes decision-making domains about health, nutrition and personal finance), might we not benefit from a decentralized approach for transmission of valuable information—without admonishing and lamenting variability in following expert recommendations?

problems. One such problem is newfound skepticism (or increased skepticism) about the intent and strategic thinking underlying the government's transmission of information (which perhaps was previously more straightforward to interpret).

2.9   Dignity Forgone

While acknowledging arguments that Conly (2018) makes against the charge that nudges diminish human dignity, it would seem, as long as we observe people who *do* perceive insult, indignity and estrangement from a government that does not value their conception of an individual's responsibility for his or her beliefs and actions the way the individual would like, that such harms should also at least be acknowledged. Some people simply want to be left alone, a disposition that welfare economics could try to take more seriously. Of course, including the desire "to be left alone" using a Bergson-Samuelson social welfare function may prove challenging for economic modellers insofar as process-dependent preferences over social allocations and policies are invoked (i.e., cannot be easily modelled using consequentialist payoff functions).

2.10   Autonomy Forgone

Reduced objective level of individual autonomy in government's eyes and, as a result of its paternalistic policies, conditioning individuals to become less responsible. Paternalistic policies could conceivably shift cultural norms away from individualistic views about who is responsible for their own wellbeing. Policies that nurture a view that government is responsible for protecting the individual from his or her own decision-making faculties, which have been judged to be pathological, should surely raise some discussion about whether cultural shifts in this direction are veritable social-welfare improvements.

2.11   Nudges Weaken the Signaling Value of Good Behavior and Crowd Out Social Reward Founded on Volunteerism

If everyone is pressured to achieve a more rigorous profile of "good behavior," then the social reward (and social meanings) from autonomously having chosen those good behaviors will change and likely diminish. We may unwittingly lose valuable information about prospective life partners, friends or employees by limiting the channels for signalling through which voluntary behavior sends important information to others and strengthens their social networks. If everyone were forced to be vegetarian, for example, one could imagine that social forces which unite vegetarian communities would likely change or diminish. If everyone were forced to listen to classical music, then one can imagine life-long opera fans and hobbyists looking for new ways to distinguish their intrinsic

appreciation. Such paternalistic proposals—albeit far-fetched—could be expected to dissolve at least some important communities and social structure by reducing the range of population-wide heterogeneity (i.e., conformity with the government's paternalistic behavioral target).

2.12   *Nudging Generates Potentially Harmful Complexity*

The following illustration concerns increased dimensionality in the decision problems that information senders and receivers both face whenever experts give themselves license to nudge. Suppose the expert possesses a scalar-valued piece of private information ω that she is asked to transmit. For simplicity, assume that the expert makes a binary choice about whether to send a verbatim copy or not: reveal ω or not. Whether she views her decision problem as binary choice, discrete choice from a finite list (of subsets of a continuous random variable's partition) or choosing a scalar value from the real line, the decision problem—without nudging—is one-dimensional. (In Crawford and Sobel's setup, the sender chooses a (coarse) subset of the partition of the support of ω without revealing its value precisely.)

Now suppose the expert ascribes to nudge theory. She seeks to paternalistically frame the information to be transmitted with other pieces of information (private or public). If she possesses a K-vector of private information $\boldsymbol{\omega}$, then she must now think strategically about which value of ωăto report *and* which other pieces of information (and values of those other variables) to report. Her action set becomes more complex. Nudging implies that she uses more variables when reasoning about strategic communication.

Even if the expert binds herself to reporting only verbatim values of any *elements* of $\boldsymbol{\omega}$ that she chooses to report, the decision about which *subset* to report causes her choice menu to expand to the power set of the elements of $\boldsymbol{\omega}$ with cardinality 2^K. This set of all subsets may not be easy for her to rank (i.e., may contain non-comparable alternative framings).

The non-expert, realizing that experts strategically choose framings, is thrust into a new communication game with larger action sets and more complexity. Reasoning about the expert's more elaborate action set, which involves choice over framings, therefore imposes a new cognitive burden on non-experts being nudged.

Nudging may also give rise to skepticism about the intentions and interests of experts trying to influence others. It could be reasonable for non-experts to apply more complex informational filters to help them interpret both the information in the expert's possession—which they genuinely wish to have and act upon—and the intent of the expert. Due to increasing complexity and skepticism about the expert's paternalistic intentions, the non-expert may rationally choose to ignore an expert's advice altogether.

2.13 Negative Externalities from Nudging

Considering the benefits and costs of nudges in public policy, the discussion above established that there is a risk of inadvertent damage to the transmission of valuable information, because more dimensions of strategic reasoning have been introduced into the government's communication strategy. As an example, consider the easy-to-observe communication patterns between the Transportation Security Administration (TSA) and travellers using US airports. The TSA communicates frequent warnings and admonitions, including looped recordings that repeatedly remind travellers to report unattended bags and that carrying liquids onto airplanes may jeopardize flight safety. These warnings are ignored by many travellers.

It is an open question whether these frequent warnings have improved transmission of information. The TSA is suspected by some fliers of exaggerating threats, even by those who regard its objectives as legitimate. People who accept that the TSA possesses an informational advantage and who want to benefit from receiving timely warnings, which are likely to contain valuable pieces of the TSA's private information, nevertheless decide to ignore those warnings. If travellers believe that the TSA exaggerates and they filter out incessant warnings repeated at frequencies they regard as unrepresentative of the objective risks, then they are likely to become conditioned to discount other messages about airport security that they might have benefited from had both parties maintained a good communication equilibrium (i.e., transparent transmission without deliberate exaggeration or discounting).

A second negative externality when nudges are used in government policymaking, which is related to information loss yet conceptually distinct from it, is behavioral change and lost payoffs associated with the loss of information. One may object that we should only care about lost information if it translates into lost payoffs. A reason for maintaining the distinction between lost information and lost payoffs due to lost information is similar to Sugden's (2018) normative analysis using the opportunity criterion. Sugden shows that removing strictly dominated future choice sets can make the person worse off, not in the payoff sense, but in the sense of having lost the opportunity to change one's mind (i.e., the lost opportunity to be a responsible agent with maximal choice sets along different continuation paths which hold option value in case of future preference change).

Insofar as nudging policies risk causing a bad communication outcome with reduced transmission of information (as described in previous paragraphs), then measurement of this loss would require two or more metrics. The first metric measures information loss in appropriate units (e.g., 1 minus a normalized discount factor that non-experts apply to experts endorsed by the government; signal-to-noise ratios; or other information-theoretic metrics). A second and

distinct metric would capture the economic loss attributable to lost information in appropriate units of payoffs or opportunity.

A third potentially negative externality from governments adopting nudge policies—on which behavioral economists have commented infrequently (as far as I am aware)—is the increased cognitive burden imposed on all agents in communication games whenever the action sets in the game are enlarged by introducing nudging. Sophistication among experts (i.e., more complex strategic reasoning by experts in the formulation of nudges), in turn, demands greater sophistication (enlarged action sets used to interpret government communication) by non-experts. A likely response to increased complexity is for non-experts to more frequently ignore experts. Transmission failure of vitally important information and a noisier information environment are among the primary risks of nudging. Non-experts could simultaneously face higher degrees of cognitive burden, wind up less well-informed, and perhaps face psychological stress from greater skepticism, antagonism toward policy makers engaged in nudging, and loss of dignity.

There is a range of opinion in the research literature as to whether paternalistic nudges can or should be construed as an affront to the individual's dignity and autonomy. We can at least include the observation that there *are* many people who find paternalistic nudging unpleasant as among the relevant stylized facts that could be integrated into social welfare analysis of policy proposals that involve nudging.

Nudges are sometimes based on experimental studies that document logical inconsistency of the average subject (e.g., between-person studies in which no single individual was ever observed to behave inconsistently). Nudging policies are then sold on the premise that an established decision-making bias can be undone or remedied. The presumed welfare improvements to be achieved by inducing more logical consistency, however, draw on scant (or altogether absent) evidence that logical inconsistency generates any meaningful economic costs—individual, social or otherwise (Berg, 2003; Berg, 2014b; Berg, 2014a; Berg and Gigerenzer, 2007; Berg and Gigerenzer, 2006; Berg and Gigerenzer, 2010; Berg *et al.*, 2016a). See Jolls *et al.* (1998) on the law and economics of de-biasing allegedly biased individuals, or Sunstein and Vermeule (2008) writing approvingly of proposals for government to infiltrate and sabotage online communities that express skepticism toward information provided by the government. Their view that governments should sometimes disseminate false information fails to account for the fragility of good communication equilibria and the lost value of information transmission once the government finds it can no longer credibly signal, transmit veridical information and be believed.

Rather than condemning skeptics and labeling them conspiracy theorists as Sunstein (2016) does, the ecological rationality approach to normative economics—which sees a *potentially* beneficial role for heterogeneity (in beliefs

and behaviors)—implies no need to intervene and force conformity to a single set of beliefs or behavioral norms. In fact, one-size-fits-all thinking leads to many potential problems, which includes the replacement of policy heterocultures across nation states with a policy monoculture, thereby losing information and new discoveries about policy making (Berg and Maital, 2007).

Ecological rationality explains why individual decision rules that deviate from axiomatic rationality can perform to a sufficiently high level of performance in a particular class of decision domains (Gigerenzer and Goldstein, 1996; Gigerenzer and Selten, 2001; Gigerenzer *et al.*, 1999; Berg and Gigerenzer, 2006; Berg and Gigerenzer, 2007; Berg and Gigerenzer, 2010; Berg *et al.*, 2016a; Berg, 2010; Berg, 2014b; Berg, 2014a; Berg, 2015; Berg, 2017). It also explains less-is-more effects in regulation and institutional design (Bennis *et al.*, 2012)—for example, the virtues of simple legal codes (Epstein, 1995); light regulation of 'tragedy of the commons' problems in public goods (Berg and Kim, 2015); beneficial price discrimination in public healthcare (Berg and Kim, 2018b); gains from decentralization of social assistance (Berg and Gabel, 2015; Berg and Gabel, 2017a; Berg and Gabel, 2017b); meritocratic education institutions based on simplicity (Berg, 2009; Berg and Nelson, 2016); the use of name recognition in scientific networks (Berg and Faria, 2008); decentralized information sharing (Kameda *et al.*, 2011; Finin *et al.*, 2009); problems caused by adding new protected classes under anti-discrimination law (Berg and Lien, 2002; Berg and Lien, 2006; Berg and Lien, 2009); decentralized solutions to Schelling's neighbourhood segregation problem (Berg *et al.*, 2010; Berg *et al.*, 2013); simplicity and transparency in government valuation of real estate (Berg, 2006a); behavioral sophistication in the design of labor market policy (Berg, 2006b); the ecological rationality of private institutional norms established by Islamic Banks (Berg and Kim, 2014; Berg and Kim, 2016; Berg *et al.*, 2016b); and the pitfalls of financial market regulation based on claims of irrationality in behavioral economics (Berg and Lien, 2003; Berg and Lien, 2005). For more instances of allegedly irrational decision-making procedures that nonetheless perform well in particular classes of investment decisions, see Berg (2014a), Berg and Kim (2014), Berg *et al.* (2017b), Goldstein and Gigerenzer (2009), Berg *et al.* (2016b), Monti *et al.* (2012), Monti *et al.* (2014), and Akhtaruzzaman *et al.* (2017).

Just as physiological health is assessed by a long list of threshold conditions covering blood pressure, pulse, body mass and multiple diagnostic blood tests, it is natural for individuals to repeatedly assess how well their own decision-making processes are performing by examining feedback from multiple metrics. A person may, for example, reflect: "I worked many hours and earned well this month, but I feel like I should have spent more time with family and friends." Proponents of nudging err by focusing on one narrow decision-making domain without fully appreciating interactions among multiple normative metrics relevant to an individual and across multiple decision domains.

There seems to be a near consensus among proponents of nudge programs that food choice is an "obvious" decision domain in which overeating is a common behavioural problem and nudges are therefore called for. Without assessing other stressors and relevant metrics of life performance, however, proponents of nudging could easily miss the correct causal mechanism. Failure of willpower may be the wrong diagnosis. Eating can function as an adaptive response to other problems, which may be measured as failures to satisfice other important components of the individual's vector of performance metrics used to assess wellbeing and life performance. Allowing for interactions among different satisficing objectives could lead researchers to help those who wish to reduce overeating toward different, perhaps more effective, decision domains that may not involve food choice at all, where a self-initiated intervention could be more helpful.

2.14   *Tobacco Sin Tax in New Zealand*

Several of the papers in this special issue on New Paternalism have used examples of government policies toward tobacco and smoking behavior. A useful example of unintended consequences of sin taxes as advocated by some behavioral economists[5] concerns tobacco taxes in New Zealand. In 2010, a Select Committee in Parliament proposed a policy of New Zealand being smoke-free by 2025, which drew widespread support from both the governing coalition and opposition parties. Parliament then implemented a series of tax increases on tobacco. The current cost of a pack of 20 cigarettes is 25 to 30 NZD (78% federal tax) with plans to continue increasing sin tax rates in the range of 10 to 40% per year, with a target of pricing a pack of cigarettes at more than 100 NZD by 2025. For low-income households that do not respond to price increases the way paternalistic policy makers wish they would, a damaging substitution effect has now been uncovered in low-income NZ households with smokers—reallocating limited disposable income away from food and into

---

[5]Sin taxes do not necessarily fit under the heading of "New Paternalism" because they do materially change the decision maker's choice set and perhaps should therefore be excluded from critical analysis of New Paternalism. In a 2017 tweet, Thaler writes: "We don't consider a tax to be a nudge." It does not stretch the imagination too far, however, to think of behavioral economists advocating revenue-neutral sin taxes as a legitimate component of their nudge-inspired behavioral policy toolkit (where revenue raised is returned as subsidies for smoking cessation services, vegetables or copies of *Nudge* and therefore interpreted as retaining the mean consumer's bundle as feasible in the post-policy choice set although consumption possibilities spaces for all consumers are materially altered thanks to modified relative prices owing to sin taxes and subsidies). Some might propose a Kaldor-Hicks criterion as a rebuttal, defending revenue-neutral sin taxes as somehow libertarian, or choice preserving, for the mean consumer—that losers from relative prices due to sin taxes can be compensated by winners, and that both will be "better off anyway", once their logical, deliberative self realizes long-run improvements in wellbeing from a fractional extra year of expected lifespan or Quality Adjusted Years of Life (QALYs).

tobacco expenditure (without necessarily increasing physical consumption of tobacco) and, as a result, reducing nutritional wellbeing for smokers and their families members (especially children). This tax now accounts for more than 2% of the national government's revenue and some not-at-all libertarian Members of Parliament who previously supported sharp sin taxes are changing their minds, however, noting that the policy harms low-income families.

2.15   Rational Choice Model of Preference Change Implies High Likelihood of Unintended Behavioral Responses to Sin Taxes

Berg *et al.* (2017a) consider a rational-choice model of reasoned, deliberative preference change. The model is a textbook budget allocation problem between effort that raises the mean level of future expected hedonic consumption and expenditure on a preference-change technology that makes it easier to avoid disappointment with one's position in life by lowering expectations, reducing what one believes is required to have succeeded. The time/effort/resource budget can be allocated only to these two choice variables: hedonic consumption or preference-change-technology reducing the amount of hedonic consumption required to satisfice. The decision maker deliberates about trade-offs of having "more" versus "being satisfied with less." Solving for the decision maker's demand functions yields a demand function for preference moderation that depends on its relative price. A numerical analysis of the model's parameter space shows that upward-sloping demand curves for preference-change technology are rather common. Nothing unusual or pathological is required. One implication is that sin taxes that make "unhealthy" eating or "excessive" borrowing more expensive—and subsidies that "incentivize" people to eat healthier or improve their financial literacy—often lead to behavioral change in the opposite direction as was intended by the policy makers. In this rational choice model of demand for effortful or costly preference change, income effects are so strong that subsidies wind up encouraging the "wrong" behavior.

2.16   Methodological Note on New Paternalists' Mis-measurement of the Individual's Objective Function "by her own Standard"

Suppose we grant that New Paternalists have identified settings in which a nudge or intervention could, in theory, succeed at helping people "by their own standard." There remains the technical challenge of measurement error that forces a trade-off between the benefits of payoff gains that paternalistic intervention might achieve against imprecision in the measurement of the behavioral target that the intervention aims to achieve. New Paternalists would readily admit that when we write a model representing the imperfect agent's payoff function, we undoubtedly miss many aspects (e.g., competing objectives) that individuals care about.

Suppose that a representative agent (i) drawn from the population under consideration is to take action x_i which New Paternalists believe is frequently chosen sub-optimally. The New Paternalist assumes that the phrase "by their own standard" is subsumed (subsumable) by a scalar valued objective function $u_i(x_i)$ that represents i's preferences (while admitting that $u_i(x_i)$ is not perfectly observable). If we are willing to assume that i's objectives are commensurable and can be represented by a utility function, then we could posit the existence of the true but imperfectly observable objective function and represent it as:

$$v_i = u_i + e_i,$$

where e_i captures "individual heterogeneity" that was abstracted away from when constructing the model $u_i = u(x_i)$. The New Paternalist faces the challenge of the measurement error represented by e_i.

In the rhetoric of Samuelson-inspired neoclassical modelling, u_i should be a reasonable "first-order approximation." The model somehow "captures" the first-derivative effects on wellbeing of changes in action vector x_i while the effects of all the missing variables or imperfection in the mapping from x_i to v_i absorbed in error term e_i are "second-order."

Following this logic, we could say that there is an approximation cost represented by some metric of e_i, represented for example by absolute error, $|e_i|$, or a percentage deviation—either $|e_i/v_i|$ or $|e_i/u_i|$ (assuming they are scaled in such a way that they exist) could serve the purpose. But how to measure measurement error in the representation of an individual's preferences when used for purposes of paternalistic government policy?

This seemingly routine technical challenge points to numerous methodological problems and opens the door to many instances of discretionary methodological choice by economists responsible for designing such policies. There is no domain-general solution to the problem of choosing an appropriate loss function to analyze the costs of mis-representing individual preferences in paternalistic policy design.

If i were balancing on a tight wire in a circus performance without a net, then the loss function for a continuously valued x_i and u_i might have binary ranges corresponding to falling or not falling. What about comparing different ways of dying? What about lexicographic preferences which admit no utility function representation? In the New Paternalism program, which vitally depends on correct measurement of "by their own standard" (u_i), are non-representable preferences considered invalid, irrelevant, or approximated to a reasonable degree by their models? These questions remain largely unanswered. The regularity by which successful people (by their own standard) do in fact change their objectives would seem to inflict yet another mortal methodological wound on underpinning the New Paternalism program. Rational people should generally expect their objectives—that is, "their own standard" for evaluating

feasible actions x_i—to change through time (and also across context at a single point in time).

As mentioned already, the requirements for rationality in New Paternalism are the axioms of internal logical consistency, which were initially proposed as technical requirements for utility representation theorems. Those theorems are, once again, invoked whenever New Paternalists model "by their own standard" with a scalar-valued objective function (whether it be veridical u_i or the approximation measured with noise, v_i).

Such abstractions can, of course, provide valuable insights about mechanisms that generate some forms of observed economic behavior. The New Paternalism program's dependence on those same assumptions (required for scalar-valued representation), however, imposes potentially mis-specified structure on rationality. In the context of paternalistic policy making, the stakes rise. Technical requirements morphed into behavioral economics' normative standard of rational behavior, resulting in a narrow conception of "by their own standard." There are few guarantees that individuals' own standards—in any portion of the empirical distributions of human performance that matter to them—conform to those technical requirements

In addition to being narrow, New Paternalists' standard of rationality is also too loose! Axiomatic rationality requirements rule out many high-performing decision-making procedures that successful and healthy people use. Higher-performing decision-making procedures quite rationally vary by context, domain and over time. Perfect internal consistency also permits many behaviors that are commonly regarded as pathological in disciplines outside economics (e.g., impatience, extreme risk aversion, suicide, terrorism, etc).

2.17   Rational Ignoring

When non-experts ignore what experts say and advise, it is, once again, easy for behavioral economists to interpret this as a "foible" (Hausman, 2018), "bias" (Gigerenzer, 2018), or as "irrational" (e.g., non-Bayesian) information updating. Berg and Hoffrage (2008) demonstrate that ignoring payoff-relevant information can be consistent with expected payoff maximization. Berg *et al.* (2016a) show that non-Bayesian belief updating can correlate with improved objective accuracy. The proposition that non-experts may rationally choose to ignore experts whose information they would like to have because of nudging policies that have been put in place exemplifies the link that Rizzo and Whitman (2009) describe between New Paternalism and behavioral economics (cf. Kapeliushnikov, 2015).

2.18   Non-paternalistic Experts

In a policy environment designed by New Paternalists as choice architects, non-experts are forced to grapple with the following questions. Does the expert

seek to help me maximize my objective function? Or does the expert seek to influence me to maximize her paternalistic view about what my objective function should be?

I will refer to a *non-paternalistic expert* (or *contractarian* in line with Sugden's (2018) adaptation of Gauthie's terminology) as one who transmits information with the goal of enabling the non-expert to maximize his objective, whatever it may be. Alternatively a *paternalistic expert* seeks to influence the non-expert to maximize an objective that is different from the non-expert's own objective.[6]

2.19   Private versus Government Speech

Although the example of information transmission from academic advisors to their students is private communication, there are similar mechanisms in play in communication games with governments in the role of expert. The risk that covert nudges induce non-experts to rationally down-weight, filter, or ignore is potentially more damaging when government is in the role of the expert. Insofar as the rise of strategic nudges and more complex communication strategies lead people toward skepticism, and greater uncertainty about which messages are worth listening to (and how to interpret them), there is a lower likelihood of achieving informationally efficient coordination on a good communication equilibrium. Nudges make coordination more challenging.

3   Socially Optimal Intensity of Skepticism Toward Government Speech?

Epstein (1998) argues for skepticism toward concentrated power and in favor of decentralization as institutional design principles for dealing with "the fragility of knowledge":

> The twin impulses of skepticism and dogmatism, then, easily lead
> to the special pleading that is the most insistent enemy of a free

---

[6]In a model where the communication action sets involve framings or nudges, the (overly) simple binary taxonomy of expert types as introduced above could be refined to reflect suggestions of McKenzie and Sher (2018) regarding how nudges could be carried out in ways that "may lessen skepticism about covert manipulation" (p. xxx). Their suggestions could also better preserve the non-expert's autonomy. They suggest that transparently informing the non-expert about the design of the nudge can "respect her dignity as an agent—and thus, in the long term, to preserve her trust" (p. xxx) (e.g., by informing whether defaults are expert recommendations or descriptions of modal behavior; informing non-experts if items included in the framing are objectively representative or non-representative of most decision problems in the class of decisions the non-expert faces). These suggestions work when nudges are based on strategically communication about context. But when nudges venture into strategic transmission of private information, then all the challenges identified remain.

society. The only way to buck that trend is to resort to a strategy that gives a very different twist to skepticism and dogmatism. The one sure dogma–that human knowledge and human plans are inevitably limited–leads to a principled skepticism about putting first our own personal and group interests. Accordingly, a sound legal order is one that responds to the fragility of knowledge by giving no one absolute control and power. It seeks the dispersion of power across individuals and social groups. Yet even this note of caution leaves much work to be done. The celebration of individual rights and the decentralization of social power does not explain how these twin objectives should be achieved.

— Epstein (1998)

In *Skepticism and Freedom*, Epstein (2003) suggests there are additional social benefits from skepticism. These arguments in favor of decentralization should be interpreted as complementing (rather than merely following from) the Fundamental Welfare Theorem. When the hypothesis of the Fundamental Welfare Theorem is not satisfied (i.e., there are externalities, market power, or asymmetric information), Epstein (1998) argues that individual autonomy should hold sway over special pleading about what others' preferences should be.[7]

Given these multiple interpretations and uses of skepticism, it would seem reasonable to assert that social welfare is non-monotonic in skepticism. Suppose there is a continuum of degrees of skepticism, denoted s, which takes on values in the unit interval ranging from minimal to maximal skepticism toward government.[8] If the government has access to at least some valuable "private" (i.e., expert) information whose transmission is impeded by skepticism, then maximal skepticism, $s = 1$, cannot be optimal (social-welfare maximizing). On the other hand, if skepticism limits the abuse of power or generates competitive pressure that selects for good governance (e.g., Tiebout competition among local or state governments), then minimal skepticism, $s = 0$, also cannot be optimal. The implication is that the socially optimal intensity of skepticism $s^* \in (0, 1)$ is an interior value (not too much and not too little).

Now consider how a policy shift in the direction of more nudging is likely to affect s^* and the level of social welfare achieved. If governments employ more strategic reasoning about the way they communicate (e.g., nudging) or grant themselves the option of lying on paternalistic grounds (Junker, 2011; Sunstein

---

[7]Policies favored by the New Paternalism program rest on claims about what the individual's true preferences are or should be. Such claims constitute special pleading because the distinction between an individual's multiple selves are tenuous and because of the difficulty in ascertaining what the individual's true preferences are.

[8]This is a strong assumption. Instances of skepticism are sometimes non-comparable and should not be elided into a single dimension. The assumption here is that s represents variation in the intensity of skepticism whose instances are of a single, well-defined kind.

and Vermeule, 2008), then s^* will likely increase. Skepticism generates social benefits over some ranges of s and is socially costly over other ranges. The ideas sketched here indicate one possible framework for analysing the risks associated with paternalistic policies while accounting for both benefits and costs of skepticism.

4   Decentralization Mislaid

New paternalists often argue that (state) power should be exercised to design choice environments in ways that influence individuals to make "better" decisions. The argument rests on the theory that biased or otherwise irrational decision-making processes impose costs on the individual's "true" self or future selves. The implication is that the *unit of analysis of the individual* is no longer rich enough to handle theorizing about social welfare, legal institutions and public policy (cf. Berg and Kim, 2018a).

Arguments in the New Paternalism program in favor of nudging often resort to, or require, that the concept of the individual as the unit of analysis is breached or problematized in some way that leads to welfare gains from nudging. This methodological shift in favor of conceiving of the individual as a bundle of selves with conflicting interests brings the welcome possibility of better incorporating internal conflict into economic decision making. Puzzlingly, the New Paternalism program does not seem to acknowledge that people (including top performers by many different metrics of wellbeing) normally find ways to deal with their conflicting ideals and often change their views about what their objectives ought to be. A research program investigating how people deal with conflicting internal motives and come to change their preferences would be a worthwhile direction for behavioral economics.

Instead, the New Paternalism program asserts that there should be one orthodox preference ordering privileged as the individual's true preferences ("by their own standard") and calls on policy makers to become choice architects or (more paternalistically than the nudging program) constrain choice sets—or lie— to address alleged instances of irrational decision making. This paternalistic rather than pluralistic methodological turn has far-reaching and destabilizing implications for theories of social welfare and the analysis of public policy.

We no doubt benefit from transmission and utilization of expert opinion. Advocates for New Paternalism seem to forget, however, that we also benefit from open debate among experts and especially from the existence of dissenting views. Unanimously held views on nutrition, medical practice, and monetary policy (to name only a few important domains where expert opinion influences government policy) are overturned with some regularity. Rapidly changing orthodoxy can be viewed generally as a positive sign that there exists a competitive marketplace for ideas.

Some deviations from orthodox expert recommendations are, no doubt, costly. Harm from those deviations could—at a point in time—possibly be reduced by nudging. Once the dynamic effects of strategic communication as enumerated in Section 2 are considered, however, it seems that the potential social costs of nudging and lost future information flows would speak against nudging as a general approach to public policy from a benefit-cost perspective. The frequently observed real-world cases in which orthodox recommendations turn out to be wrong or incomplete should, moreover, give pause to those advocating for nudges as government policy.

References

Akhtaruzzaman, A., N. Berg, and C. Hajzler. 2017. "Return Of Capital Dominates Return On Capital?: FDI in Developing Countries". *European Journal of Political Economy.*

Arthur, W. B. 1994. "Inductive Reasoning and Bounded Rationality". *American Economic Review: Papers and Proceedings.* 84: 406–411.

Bennis, W., K. Katsikopolous, D. Goldstein, A. Dieckmann, and N. Berg. 2012. "Designed to fit minds: Institutions and ecological rationality". In: *Ecological Rationality: Intelligence in the World.* Ed. by P. M. Todd, G. Gigerenzer, and ABC Research Group. New York: Oxford University Press. 409–427.

Berg, N. 2003. "Normative behavioral economics". *Journal of Socio-Economics.* 32: 411–427.

Berg, N. 2006a. "A simple Bayesian procedure for sample size selection in an audit of property value appraisals". *Real Estate Economics.* 34(1): 133–155.

Berg, N. 2006b. "Behavioral labor economics". In: *Handbook of Contemporary Behavioral Economics.* Ed. by M. Altman. New York: M.E. Sharpe. 457–478.

Berg, N. 2009. "Experiments to generate new data about school choice". *Journal of School Choice.* 3(4): 397–413.

Berg, N. 2010. "Behavioral Economics". In: *21st Century Economics: A Reference Handbook.* Ed. by R. C. Free. Vol. 2. Los Angeles: Sage. 861–872.

Berg, N. 2014a. "Success from satisficing and imitation: Entrepreneurs' location choice and implications of heuristics for local economic development". *Journal of Business Research.* 67(8): 1700–1709.

Berg, N. 2014b. "The consistency and ecological rationality schools of normative economics: Singular versus plural metrics for assessing bounded rationality". *Journal of Economic Methodology.* 21(4): 375–395.

Berg, N. 2015. "Gerd Gigerenzer". In: *Real World Decision Making: An Encyclopedia of Behavioral Economics.* Ed. by M. Altman. Santa Barbara: Praeger, ABC-CLIO.

Berg, N. 2017. "Smart people's rational mistakes". In: *Handbook of Behavioral Economics and Smart Decision-Making: Rational Decision-Making Within the Bounds Of Reason*. Ed. by M. Altman. Edward Elgar Publishing. 43–67.

Berg, N., K. Abramczuk, and U. Hoffrage. 2013. "Schelling's neighborhood segregation model with FACE-Recognition". In: *Simple Heuristics in a Social World*. Ed. by R. Hertwig, U. Hoffrage, and The ABC Research Group. New York: Oxford University Press. 225–257.

Berg, N., C. Berg, and M. Ungor. 2017a. *Hedonic aspiration control*. Working Paper. University of Otago.

Berg, N., G. Biele, and G. Gigerenzer. 2016a. "Consistent Bayesians are no more accurate than non-Bayesians: Economists surveyed about PSA". *Review of Behavioral Economics (ROBE)*. 3(2): 189–219. DOI: 10.1561/105.00000034.

Berg, N. and J. Faria. 2008. "Negatively correlated author seniority and the number of acknowledged people: Name-recognition as a signal of scientific merit". *Journal of Socio-Economics*. 37: 1234–1247.

Berg, N. and T. Gabel. 2015. "Did Canadian welfare reform work?: The effects of new reform strategies on Social Assistance participation". *Canadian Journal of Economics*. 48(2): 494–528.

Berg, N. and T. Gabel. 2017a. "Who Was Affected by New Welfare Reform Strategies?: Microdata Estimates from Canada". *Applied Economics*. 49(14): 1395–1413.

Berg, N. and G. Gigerenzer. 2006. "Peacemaking among inconsistent rationalities?" In: *Is There Value in Inconsistency?* Ed. by C. Engel and L. Daston. Nomos: Baden-Baden. 421–433.

Berg, N. and G. Gigerenzer. 2007. "Psychology implies paternalism?: Bounded rationality may reduce the rationale to regulate risk-taking". *Social Choice and Welfare*. 28(2): 337–359.

Berg, N. and G. Gigerenzer. 2010. "As-if behavioral economics: Neoclassical economics in disguise?" *History of Economic Ideas*. 18(1): 133–166.

Berg, N. and U. Hoffrage. 2008. "Rational ignoring with unbounded cognitive capacity". *Journal of Economic Psychology*. 29: 792–809.

Berg, N. and U. Hoffrage. 2010. "Compressed environments: Unbounded optimizers should sometimes ignore information". *Minds and Machines*. 20(2): 259–275.

Berg, N., U. Hoffrage, and K. Abramczuk. 2010. "Fast Acceptance by Common Experience: FACE-recognition in Schelling's model of neighborhood segregation". *Judgment and Decision Making*. 5(5): 391–410.

Berg, N. and J. Y. Kim. forthcoming 2019. "A good advisor". *Bulletin of Economic Research*.

Berg, N. and J. Y. Kim. 2014. "Prohibition of Riba and Gharar: A signaling and screening explanation?" *Journal of Economic Behavior and Organization*. 103: 146–159.

Berg, N. and J. Y. Kim. 2015. "Quantity restrictions with imperfect enforcement in an over-used commons: Permissive regulation to reduce over-use?" *Journal of Institutional and Theoretical Economics*. 171(2): 308–329.

Berg, N. and J. Y. Kim. 2016. "Harsh norms and screening for loyalty". *Bulletin of Economic Research*. 68(3): 205–217.

Berg, N. and J. Y. Kim. 2018a. *Free expression and defamation*. Law, Probability and Risk.

Berg, N. and J. Y. Kim. 2018b. "Price discrimination in public healthcare". *Australian Economic Papers*. 57(2): 181–192.

Berg, N., M. El-Komi, and J.-Y. Kim. 2016b. "The puzzle of uniform standards and market segmentation among Islamic banks". *Journal of Economic Behavior and Organization*. 132: 39–49.

Berg, N. and D. Lien. 2002. "Measuring the effect of sexual orientation on income: Evidence of discrimination?" *Contemporary Economic Policy*. 20: 394–414.

Berg, N. and D. Lien. 2003. "Tracking-error decision rules and accumulated wealth". *Applied Mathematical Finance*. 10(2): 91–119.

Berg, N. and D. Lien. 2005. "Does society benefit from investor overconfidence in the ability of financial market experts?" *Journal of Economic Behavior and Organization*. 58: 95–116.

Berg, N. and D. Lien. 2006. "Same-sex sexual behavior: U.S. frequency estimates from survey data with simultaneous misreporting and non-response". *Applied Economics*. 38(7): 757–769.

Berg, N. and D. Lien. 2009. "Sexual orientation and self-reported lying". *Review of Economics of the Household*. 7(1): 83–104.

Berg, N. and S. Maital. 2007. "Tailoring globalization to national needs and wellbeing: One size never fits all". *Global Business and Economics Review*. 9(2/3): 319–334.

Berg, N. and T. Nelson. 2016. "Pregnancy and dropout: Effects of family, neighborhood and high school characteristics on girls' fertility and dropout status". *Population Research and Policy Review*. 35(6): 757–789.

Berg, N., S. Prakhya, and K. Ranganathan. 2017b. "A satisficing approach to eliciting risk preferences". *Journal of Business Research*. 82: 127–140.

Berg, N. and T. Gabel. 2017b. "Did tax cuts on earned income reduce Social Assistance participation in Canada?" *Australian Tax Forum*. 32(1).

Binder, M. 2010. *Elements of an evolutionary theory of welfare: Assessing welfare when preferences change*. Hoboken, NJ: Taylor and Francis.

Binder, M. 2013. "Should evolutionary economists embrace libertarian paternalism?" *Journal of Evolutionary Economics*. Advance online publication.

Bookstaber, R. and J. Langsam. 1985. "On the optimality of coarse behavior rules". *Journal of Theoretical Biology*. 116: 161–193.

Bruni, L. and P. L. Porta. 2007. *Handbook on the economics of happiness*. Gloucestershire: Edward Elgar.

Caplan, B. 2000. "Rational irrationality: A framework for the neoclassical-behavioral debate". *Eastern Economic Journal.* 26: 191–211.

Conly, S. 2018. "Paternalism and Altruism". *Review of Behavioral Economics.*

Crawford, V. and J. Sobel. 1982. "Strategic Information Transmission". *Econometrica.* 50: 1431–1451.

Epstein, R. A. 1995. *Simple Rules for a Complex World.* Cambridge: Harvard University Press.

Epstein, R. A. 1998. *Principles For A Free Society Reconciling Individual Liberty With the Common Good.* Perseus Books.

Epstein, R. A. 2003. *Skepticism and Freedom: A Modern Case For Classical Liberalism.* Chicago: Chicago University Press.

Epstein, R. A. 2011. *Design for Liberty: Private Property, Public Administration, and the Rule of Law.* Cambridge: Harvard University Press.

Epstein, R. A. 2014. *The Classical Liberal Constitution: The Uncertain Quest for Limited Government.* Cambridge: Harvard University Press.

Finin, T., A. Joshi, H. Kargupta, Y. Yesha, J. Sachs, E. Bertino, L. Ninghui, C. Clifton, G. Spafford, B. Thuraisingham, M. Kantarcioglu, A. Bensoussan, N. Berg, L. Khan, H. Jiawei, X. Z. Cheng, R. Sandhu, X. Shouhuai, J. Massaro, and L. Adamic. 2009. "Assured information sharing life cycle, Intelligence and Security Informatics". In: *ISI '09 IEEE International Conference.* 307–309.

Gigerenzer, G. 2018. *Bias bias. Working Paper.* Max Planck Institute of Human Development.

Gigerenzer, G. and D. G. Goldstein. 1996. "Reasoning the fast and frugal way: Models of bounded rationality". *Psychological Review.* 103: 650–669.

Gigerenzer, G. and R. Selten. 2001. *Bounded Rationality: The Adaptive Toolbox.* Cambridge: The mit Press.

Gigerenzer, G., P. M. Todd, and The ABC Research Group. 1999. *Simple Heuristics that Make us Smart.* Oxford: Oxford University Press.

Gintis, H. 2007. "The Dynamics of General Equilibrium". *The Economic Journal.* 117(523): 1280–1309.

Goldstein, D. G. and G. Gigerenzer. 2009. "Fast and frugal forecasting". *International Journal of Forecasting.* 25(4): 760–772.

Hausman, D. M. 2018. "Efficacious and Ethical Public Paternalism". *Review of Behavioral Economics.*

Hertwig, R., U. Hoffrage, and The ABC Research Group. 2013. *Simple Heuristics in a Social World.* New York: Oxford University Press.

Jolls, C., C. R. Sunstein, and R. H. Thaler. 1998. "A behavioral approach to law and economics". *Stanford Law Review.* 50: 1471–1541.

Kameda, T., T. Tsukasaki, R. Hastie, and N. Berg. 2011. "Democracy under uncertainty: The wisdom of crowds and the free-rider problem in group decision making". *Psychological Review.* 118: 76–96.

Kapeliushnikov, R. 2015. "Behavioral economics and the "new" paternalism". *Russian Journal of Economics.* 1(1): 81–107.

Khalil, E. L. 2017. "Socialized view of man vs. rational choice theory: What does Smith's sympathy have to say?" *Journal of Economic Behavior and Organization.* 143: 223–240.

McKenzie, C. R. M. and S. Sher. 2018. "Constructed Preferences, Coherence Violations, and Rationality". *Review of Behavioral Economics.*

Monti, M., L. Martingon, G. Gigerenzer, and N. Berg. 2012. "How do common investors behave? Information search and portfolio choice among bank customers and university students". *Mind and Society.* 11(2): 203–233.

Monti, M., V. Pelligra, L. Martignon, and N. Berg. 2014. "Retail investors and financial advisors: New evidence on trust and advice taking heuristics". *Journal of Business Research.* 67(8): 1749–1757.

Rizzo, M. J. and D. G. Whitman. 2009. "The knowledge problem of the new paternalism". *Brigham Young University Law Review.* 4: 905–968.

Sugden, R. 2018. "The value of opportunity, and why this value is independent of assumptions about rational choice". *Review of Behavioral Economics.*

Sunstein, C. R. 2016. *Conspiracy Theories and Other Dangerous Ideas.* Simon and Schuster.

Sunstein, C. and A. Vermeule. 2008. "Conspiracy theories". In: Harvard Public Law Working Paper No. 08-03; U of Chicago, Public Law Working Paper No. 199; U of Chicago Law & Economics, Olin Working Paper No. 387.

Thaler, R. H. 1991. "The psychology of choice and the assumptions of economics". In: *Quasi Rational Economics.* New York: Russell Sage Foundation.

Thaler, R. H. and C. R. Sunstein. 2008. *Nudge: Improving Decisions about Health, Wealth, and Happiness.* New Haven: Yale University Press.

Todd, P. M., G. Gigerernzer, and The ABC Research Group. 2012. *Ecological Rationality: Intelligence in the World.* Oxford University Press.