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ANALYSIS & COMMENTARY

Approaches Based On Behavioral Economics Could Help Nudge Patients And Providers Toward Lower Health Spending Growth

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ABSTRACT Policies that change the environment or context in which decisions are made and “nudge” people toward particular choices have been relatively ignored in health care. This article examines the role that approaches based on behavioral economics could play in “nudging” providers and patients in ways that could slow health care spending growth. The basic insight of behavioral economics is that behavior is guided by the very fallible human brain and greatly influenced by the environment or context in which choices are made. In policy arenas such as pensions and personal savings, approaches based on behavioral economics have provided notable results. In health care, such approaches have been used successfully but in limited ways, as in the use of surgical checklists that have increased patient safety and reduced costs. With health care spending climbing at unsustainable rates, we review the role that approaches based on behavioral economics could play in offering policy makers a potential set of new tools to slow spending growth.

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Health care spending in most advanced economies is on an unsustainable course. Despite a historic slowdown in the rate of growth in recent years, spending on health care in the United States is projected to grow faster than the economy as a whole in 2013, a trend echoed in most other developed economies.¹ Bending the “cost curve”—the trend line in health care cost growth—remains an elusive goal for governments around the world, with rising spending seen as a force that is very difficult to reverse.²

There is a widespread desire to reduce cost growth while avoiding the rationing of beneficial care, or imposing cuts that could have unintended consequences. An example of the latter would be reduced physician reimbursements in Medicare that made some physicians less willing to serve Medicare beneficiaries, as appears to

have happened to some degree in the United States. But reducing costs without drastic measures is likely to be achievable only if ways are found to influence the decision making of the key actors in health systems with greater success than in the past. Those key actors are providers, patients, policy makers, and industry executives, all of whose actions can drive up spending on health care for everything from preventable medical conditions to unnecessary tests and procedures.

The conventional tools that are available for changing behavior have failed to achieve the necessary outcomes required to bend the health spending curve. Efforts to contain health expenditure have not followed any single conceptual framework. However, the policy levers in use, which often rely on price changes and information-based interventions, are largely informed by the conventional economic theory

of “rational choice.”

This theory assumes that people weigh the probabilities and utilities of possible outcomes based on information in the marketplace about price, quality, function, and other factors, and that they then reliably pursue the option that provides the most benefit to themselves, however that is defined. But policies that rely on “rational” responses often fail to achieve their objectives.

For example, pay-for-performance schemes include financial incentives that should encourage providers to improve the quality of care they provide, lower the costs of that care, and sometimes do both. Yet there is little evidence that these programs have reliably led to improved care or greater cost-effectiveness.³

Similarly, patients continue to make suboptimal decisions despite being given ever more choice and information. In a study by Florian Heiss and colleagues, fewer than one in ten people given access to information and a choice of plans as part of Medicare’s Part D prescription drug program picked the most cost-effective option.⁴

Insights challenging the traditional assumptions of rationality have been identified through work in behavioral economics, a field that draws on both economics and psychology. The basic insight of behavioral economics is that human behavior is not guided by logic, as in a supercomputer, but rather is determined by the very fallible brain and greatly influenced by the environment or context in which choices are made.⁵ This article considers how recent insights from behavioral economics can be applied to cutting spending on ineffective health care.

Targeting Automatic Processing

In broad terms, psychologists and neuroscientists have identified two distinct “systems” that operate in the brain.⁵ In system 1, the automatic system, processes are fast, unconscious, intuitive, and affective—that is, based on mood or emotion. In system 2, the reflective system, processes are slow, conscious, reflective, and rational.

Much of the time people act automatically, without really thinking about their decisions. The human brain is able to process multiple inputs simultaneously and unconsciously, and it does so by using a number of simplifying rules of thumb, known as heuristics. Using these shortcuts bypasses full information processing requirements, allowing people to make decisions more easily.

For the most part, these rules of thumb work well, but they can lead people into cognitive

biases and predictable errors that distort “rational” decision-making processes.⁵ Familiar examples include taking price as an indicator of quality or assuming that bigger or more is better. In clinical contexts these mental shortcuts may lead to excessive diagnostic testing and a preference for new and expensive diagnostics that are either not necessary or more expensive than alternatives that are equally effective.

Behavioral scientists have identified dozens of heuristics and their related cognitive biases, such as those stemming from emotion, preconceptions, availability of information, tendencies toward action or inaction, and aversions of various kinds. The use of such automatic drivers can put people out of touch with their conscious desires and lead to imperfect and costly decisions (some examples are presented in online Appendix Exhibit 1).⁶

The existence of two different processing systems operating in the brain suggests two different routes to changing behavior—that is, altering the more automatic processes of judgment and influence (system 1), and affecting what people consciously think about (system 2). Despite the evidence demonstrating the importance of automatic processing in decision making, most traditional policy tools have targeted the reflective mind.

It’s worth noting that rational choice theory and many of the policy tools that stem from it are not so much wrong when it comes to human decision making as they are incomplete—because they ignore automatic processes. Policies based on behavioral economics attempt to account for this omission in two ways. First, they try to minimize decision making under the automatic system by using strategies that attempt to lead decision makers away from biases and shortcuts. And second, recognizing that some amount of automatic processing cannot be avoided, they attempt to make the biases inherent in automatic processes work in the favor of the decision maker to achieve results consistent with desired goals.⁷

Going With The Grain Of Human Behavior

Behavior can be strongly influenced by altering the “choice architecture,” as Richard Thaler and Cass Sunstein call it in *Nudge*.⁷ Simply put, choice architecture is the context or environment in which choices are presented. Policy makers who understand how people reliably behave in specific situations can design policies that go with the automatic grain of human behavior rather than against it. In this way, the same errors that trip people up can be used to help them

make better and more cost-effective choices.

Behavioral economics has come a long way over the past decade. For example, a Behavioural Insights Team now advises the British prime minister, and key members of President Barack Obama's administration (such as Sunstein and Peter Orszag) have been prominent devotees of behavioral economics.

The field of behavioral economics has already produced a number of public policy successes. Perhaps the most notable is in the area of retirement savings, where the switch to automatic enrollment in pension plans is being introduced in a number of countries. Automatic enrollment, with an opt-out option if a person decides not to participate, takes advantage of people's tendency to favor the "default" option. In other words, when enrollment is presented as the default, a greater percentage of people participate in retirement savings plans than when the default is not enrolling. Changing to an automatic enrollment and "opt out" policy can more than double participation rates.⁸

This approach builds on the finding that inertia plays a big role in decision making, which means that people have a tendency to stick with the default option when offered a range of choices. Making enrollment something consumers must "opt out" of ends up making more of them "choose" to enroll without affecting the menu of options available to them.

The Mindspace Framework

In 2010 some of the authors of this paper helped develop the Mindspace framework, which is being widely used in policy making to improve the effectiveness of existing and new policies to change behavior.^{9,10} The framework was developed through an extensive literature review and interviews with leading behavioral scientists and senior policy makers. It outlines many of the effects, such as defaults, that have been found to reliably affect behavior by operating largely, although not exclusively, on automatic systems and processes.

Mindspace is actually an acronym involving nine effects on behavior, which go by the shorthand names of Messenger, Incentives, Norms, Defaults, Salience, Priming, Affect, Commitments, and Ego (Appendix Exhibit 2).⁶ In this article we discuss these nine elements of the framework and explore how they can explain or counter the behavioral components that contribute to spending on ineffective health care. We provide examples of policies or initiatives where applicable.

MESSENGER The importance that individuals give to information is heavily influenced by their

impulsive reactions to the source of that information, or the messenger—which is sometimes even more influential than the content of the message. People irrationally disregard advice from sources they do not like, while they are inclined to act on information from a source they respect or who is an expert in his or her field.¹¹

Source credibility is an important consideration for anyone trying to influence decisions that have cost implications. Automatic responses to the source of the message can influence reflective reactions to the message's content. If the goal is to get physicians to incorporate best practices into routine care, it is useful—and maybe not surprising—to know that physicians take more note of information and recommendations from professional organizations than of almost identical advice from health insurance organizations.

A study published in 1994 reported that 82 percent of physicians trusted clinical guidelines from their own professional association, while only 6 percent of physicians trusted the same recommendations from insurance companies.¹² Similarly, the proportion of parents having confidence in vaccine information depended in large part on the source of the information. Seventy-six percent of parents endorsed the advice of their child's pediatrician; just 23 percent endorsed the advice of government experts or officials.¹³

INCENTIVES Incentives are widely used in the health domain to influence the behavior of both providers and patients. However, incentives by themselves are not always acted on in predicted ways, with a range of heuristics and cognitive biases shaping individuals' responses. For example, people are "loss averse," acting more to prevent losses than to achieve gains of equivalent magnitude.⁵ Most incentive schemes tend to offer rewards to participants, but inducing them to feel loss if they fail to do something might be more motivating than rewarding them by the same amount for doing something.

As an example, consider attempts to reduce levels of obesity. Incentive programs aimed at reducing obesity have not demonstrated any substantial success.¹⁴ But using a behavioral economics framework, Kevin Volpp and colleagues were able to demonstrate the effectiveness of one program, at least in the short term. In this program, participants risked losing part of a financial "reward," which included some of their own money—deposited in advance and "matched" by study sponsors—if they failed to achieve their weight loss targets.¹⁵ Additional work by Volpp has shown how incentives can be used to improve medication adherence, specifically in the case of warfarin, a drug whose suboptimal use

places millions of users at risk of stroke and major bleeding each year, which can have large financial consequences for health systems.¹⁶

NORMS Underlying a number of behaviors with cost consequences is the fact that people incorrectly perceive the attitudes and behaviors of others to be those of the majority. That is, perceptions of reality tend to be heavily influenced by anecdotes and personal experience. As a consequence of the desire to conform, this can be an automatic but powerful driver in motivating people to adjust their behavior toward a pseudo-norm.

Once established, norms of behavior can be hard to change even when they are harmful and counterproductive. Such norms have been well documented in the cases of smoking, illicit drug use, weight gain, and a variety of other health behaviors.¹⁷

Social norms are among the best predictors of alcohol misuse on college campuses, exceeding the relative contribution of demographic factors, drinking motives, and alcohol expectancies—that is, expectations of alcohol's physiological effects.¹⁸ Interventions that seek to reduce harmful misperceptions of peer norms have been used to reduce problem alcohol use.

For example, a comprehensive set of interventions communicating accurate local norms of alcohol use in college students not only reduced misconceptions about alcohol misuse but also reduced by at least 30 percent the personal consumption of alcohol and the negative consequences associated with problem drinking.¹⁹ The UK government is implementing a large-scale trial of a similar initiative across all universities in Wales.²⁰

DEFAULTS Decision making is predictably affected by the tendency people have to prefer that things remain the same.²¹ This is important because most real-world decisions have doing nothing as an option. Policy makers' choice of default in systems involving human choice has large and often important effects, but very often the default setting is chosen without a specific goal in mind.²²

Using defaults as a policy tool in health care has come to prominence in relation to their influence on organ donation registration, following evidence that policies setting "donor" as the default option (opt-out rather than opt-in policies) dramatically increased the proportion of people who effectively consented to become organ donors—should the situation arise.²³ Parts of the United Kingdom are now enacting legislation to move toward an opt-out system.

Default settings could also be used in other strategies, from automatically enrolling workers in health insurance coverage to promoting the

consistent use of best practices and cost-effective care.

For example, prescription medications represent a large part of health care costs in the United States. Despite widespread substitution of generics for brand-name drugs, it is estimated that more than \$9 billion per year could be saved if the substitution were even broader.²⁴ Educating or incentivizing prescribers to use generic drugs can be expensive and may lead to only moderate changes in prescribing behavior. But dramatic and sustained improvements have been seen with electronic generic substitution support, in which a prescription for a brand-name drug defaults automatically to a cheaper alternative.

At Vanderbilt University Medical Center, the proportion of generic prescriptions increased from 32.1 percent to 54.2 percent over a two-year period following the change in default.²⁵ Two years after the change, the proportion of generic prescribing remained significantly higher for prescriptions using the system (58.1 percent) than for hand-generated prescriptions (37.4 percent), leading to substantial cost savings.

SALIENCE Because people have limited cognitive resources, their choices are heavily influenced by what their attention is drawn to, and that is often whatever is novel and relevant.⁵ As a consequence, people often make important decisions on the basis of a single criterion, ignoring other relevant material.

The implication of this finding is that interventions can change behavior by simply making other important dimensions salient as well. The growth in ineffective health spending has renewed pressure on health professionals to practice cost-effective care. But even though physicians' choices account for a large proportion of health care spending, many fail to take information on costs, including cost-effectiveness calculations, into account when they choose among different diagnostics and treatments.

To some degree, this lack of concern about costs among physicians has been driven historically by payment incentives that did nothing to discourage the ordering of expensive tests and procedures. However, in an era of accountable care, where there are incentives to meet cost and outcomes targets, physicians' consideration of cost will become increasingly important. In this context, it is interesting to note that when salient price information has been provided to physicians, the total cost of tests ordered has fallen, compared to control groups.

In one study the average reduction in the total cost of tests ordered per patient was 31 percent in a group of providers who received information about the price of tests, relative to the control

group.²⁶ Similarly, presenting cost data alongside quality information that was easy to interpret improved the likelihood that patients would choose high-value hospitals, rather than simply assuming that high cost was equated with quality.²⁷

Without accompanying quality information, a substantial minority of patients shied away from the low-cost option, presumably because they automatically associated low cost with low quality. The study participants who saw quality as well as cost information were one-half to one-third as likely as the group who only considered cost information to equate high cost with high quality.

PRIMING Priming explains how simple environmental cues can have powerful influences on subsequent behavior. Through priming, decision making can be subconsciously altered by exposure to certain contextual influences that come to people through their senses. In this context, the sights, smells, and sounds that combine to form impressions are called *primes*.

For example, external cues have been shown to have an impact on food consumption: People consume more calories when they eat food from bigger containers or when they watch food-related advertising. Researchers found that children consumed 45 percent more calories when exposed to food advertising during commercial breaks, compared to children exposed to non-food advertisements.^{28,29} Such decisions are largely outside of conscious awareness.

Priming is perhaps the least understood and explored element of Mindspace. Nonetheless, an awareness of this area encourages general thinking about how to modify the physical environment in ways to encourage better choices. For example, a number of schools, workplaces, and supermarkets are experimenting with modifications to cafeterias in an effort to prime people to make healthy choices. Some are displaying fruit prominently at checkouts.³⁰

AFFECT Affective or emotional reactions are often the first responses people have to a stimulus and are a powerful and unconscious force in decision making.³¹ Relying on a “gut feeling” provides a quicker way of navigating complex and uncertain choices, but it can also be deceptive and result in an irrational decision.

Because many medical decisions involve affective states such as fear, anxiety, and pain, decisions with long-term consequences may be made on the basis of very transient feelings. For example, a patient may decide to go ahead with a further course of debilitating, and expensive, chemotherapy for life-limiting cancer. This decision may take place in a doctor’s office only a few minutes after the patient has received bad news,

even though in less emotional states many people trade length of life for a higher-quality death.³²

Such decisions can have large cost implications because care near the end of life consumes a disproportionate share of health care costs.³³ George Loewenstein has suggested that in situations characterized by dramatic fluctuations in individual preferences, people should take a certain amount of time to deliberate—allowing them to experience a range of affective states before making a decision that has lasting consequences.³⁴

COMMITMENTS Many people are aware of their lack of willpower and try to circumvent it. For example, those who do not exercise as regularly as they know they should may use “self-commitment” devices such as a gym membership to lock themselves into a course of action that they might not otherwise choose but that produces a desired result.

Although the decision to “precommit” may be a reflective or “system 2” rational action, the subsequent effects of commitment devices operate largely through automatic or “system 1” processes. Thus, commitment devices offer an example of reflective judgments made in advance to produce an “automatic” response in favor of the person making the decision. With such a precommitment, an individual’s automatic response may be to avoid wasting a gym membership by exercising, instead of to avoid the pain and inconvenience of exercising—which might be the case in the absence of a prior financial commitment.

Another example comes from tobacco use. The Centers for Disease Control and Prevention estimates that smoking costs the US economy approximately \$193 billion per year, with \$97 billion in lost productivity and \$96 billion in health care expenditures.³⁵ Many smokers continue their habit in spite of a desire to quit. Smokers attempting to quit have long used commitment devices, but these can be strengthened through the insight that such devices usually become more effective as the costs of failure increase.

For example, Committed Action to Reduce and End Smoking is a well-publicized commitment savings program implemented in the Philippines.³⁶ In this program, smokers voluntarily deposit funds in a savings account for six months, after which they take a urine test for nicotine. If they pass, their money is returned to them. Otherwise it is given to charity, stimulating the powerful automatic force of loss aversion. Smokers who participated in the program were three percentage points more likely to remain abstinent at six months compared to a control group, and this effect persisted in a surprise

test of abstinence at twelve months.

EGO People have a psychological need to maintain a positive self-image, which leads them to act in ways that make them feel better about themselves. This is caused in part by automatic impulses to behave in ways that enhance social status and that allow people to compare themselves favorably with others.

Rankings of the performance of physicians or hospitals are becoming increasingly familiar and can be responsible for pushing up standards. No person or institution wants to be at the bottom of such a ranking. Publishing cardiac surgery mortality data in the United Kingdom led to decreased risk-adjusted mortality, with no evidence that higher risk patients were being prevented from undergoing surgery.³⁷

There is little evidence of how ego effects can be played on to increase the provision of cost-effective care. However, more could certainly be done to recognize physicians, hospitals, and payers that provide high-quality, cost-effective services. The tendency for some physicians, hospitals, and whole regions to spend more money than their peers, while achieving the same outcomes, should be more widely presented as inferior performance.²

Discussion

In attempts to slow the growth of health spending, there is ongoing debate about what combination of policy tools can deliver the right balance of quality, access, and cost-effectiveness. Policies that change the environment or context in which decisions are made and “nudge” people in particular directions have received little attention in the past. However, with health expenditures still rising in many countries—despite the widespread implementation of conventional policy levers such as information and incentives—these policies are now capturing the interest of policy makers and health care providers.

Traditional tools are and will remain important, but they have had limited success. Undoubtedly, more could be done with different combinations of traditional policies or by implementing them more rigorously. But for health systems facing unsustainable spending increases, approaches based on behavioral economics offer a powerful set of new and enhanced policy tools.

The decision-making environment in health

care is fertile ground for the use of these approaches, given the widespread influence of context on people’s choices and the limited ability of standard economic models to explain their behavior in the sector.³⁸ Some areas of health care have warmed more quickly than others to the idea of understanding the role of behavior in care delivery and intervening where problems are identified.

In patient safety, the study of “human factors” has adopted the techniques of psychology, engineering, and design to minimize the risk to patients from clinicians’ all-too-human behavior. Simple, low-cost approaches to normalizing and systematizing clinical activity have already been found. A notable example is the World Health Organization’s surgical safety checklist, which not only has been shown to improve clinical outcomes but also saves nearly \$26 every time it is used during an operation.³⁹

Conclusion

We recognize that many of our policy suggestions are speculative and that more rigorous impact evaluations are required. However, strong evidence already exists to support incorporating behavioral insights into policy design in other domains.⁴⁰ Interest by organizations such as the National Institutes of Health and the Robert Wood Johnson Foundation in funding health-related research in behavioral economics is likely to lead to strong evidence in the health sector as well.

We also recognize that we have not touched on the major ethical issues associated with using interventions that act on automatic processes. For example, who decides on the “choice architecture” that may shape another’s decisions and actions, and on what ethical basis?

In addition, it is unclear how lasting many of the effects described in behavioral economics are, how effects that work in one set of circumstances will work in another, and whether effects that work well with one segment of the population will work with another. However, these issues may reinforce the need for more thinking and research in this field.

The mechanisms of behavior change that we have described have untapped potential and may powerfully complement traditional policy levers. As the crisis of cost control becomes ever more pressing, we need to explore all possibilities. ■

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In this month's *Health Affairs*, Dominic King and coauthors examine the role that approaches based on behavioral economics could play in "nudging" providers and patients in ways that could slow health care spending growth. Such approaches have been used successfully in health care, but in limited ways, such as the use of surgical checklists that have increased patient safety and reduced costs. With health care spending climbing at unsustainable rates, the authors argue that the potential of other approaches based on behavioral economics to change the behavior of providers or patients should be more fully explored, given the successes shown in employing these concepts in other fields, such as spurring retirement savings.

King is a clinical lecturer in surgery at Imperial College London. He combines clinical practice in general surgery with active research interests in behavioral economics and "mhealth," or mobile health. He is a coauthor of the influential UK government's Mindspace report, which is widely used by policy makers as an accessible summary of a wide body of research in behavioral economics. King has a master's degree and is completing a doctorate in behavioral

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Felix Greaves is an honorary clinical research fellow in the Department of Primary Care and Public Health and at the Centre for Health Policy, Imperial College London. He is also a public health registrar in South West London and an academic clinical fellow at the National Institute for Health Research. Greaves's research interests are in measuring quality and safety in health care systems. He earned a master's degree in public health from Harvard University, an MBA from Imperial College London, and a medical degree from Oxford University.



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Ara Darzi is the Paul Hamlyn Chair of Surgery at Imperial College London, chair of the Imperial College Health Partnership, director of the Institute of Global Health Innovation, and a professor of surgery at the Institute of Cancer Research. He was parliamentary under secretary of state at the UK Department of Health until 2009, when he was appointed the United Kingdom's Global Ambassador for Health and Life Sciences, an appointment reconfirmed in 2010 by Prime Minister David Cameron. He has also been named a Knight Commander of the Most Excellent Order of the British Empire, is a member of the House of Lords, and is a member of Her Majesty's Most Honourable Privy Council. Darzi earned a medical degree from Trinity College, University of Dublin.