



**SOCIETY OF
ACTUARIES**

Article from
Health Watch
August 2020



Behavioral Economics: Overview and Health Care Applications

By Jeff Chanin, Randy Herman, Tony Pistilli and Brian Plaskow

Authorities at Schiphol Airport in Amsterdam etched an image of a fly into each urinal in the airport. This was very effective and is a good example of an application of behavioral economics.

“Wait, what?”

Sorry, we should have provided a better explanation of that example.

Behavioral economics is “a method of economic analysis that applies psychological insights into human behavior to explain economic decision-making.”¹ The most significant difference between traditional economics and behavioral economics is that the former assumes an individual “thinks and chooses unfailingly well,”² whereas the latter assumes an individual is “not only irrational, but predictably irrational.”³ Behavioral economics attempts to identify and quantify suboptimal and biased choices commonly made by individuals. By understanding behavioral economics, actuaries can better explain, predict and promote consumer behavior.

The clever people at Schiphol Airport wanted to reduce maintenance costs. The urinal fly etchings provided men targets at which to aim. These targets were effective in focusing attention and associated accuracy in the use of the urinals. Spillage was reduced by 80 percent!⁴ Traditional economics has little to say about this mechanism to reduce maintenance costs (there is little to no gain to the user from better aim), but behavioral economics took advantage of individual human behavior to the benefit of the airport, with no loss or harm to its customers.



This article provides an overview of behavioral economics theory as it relates to health and welfare insurance plans and provides summaries of two sample applications of the theories: enrollment in health insurance exchanges created by the Patient Protection and Affordable Care Act (PPACA), and product design considerations in light of vast health illiteracy.

OVERVIEW

Behavioral economics theories involve various aspects of instinctive and socialized human behavior. For example, common theories address the tendency of individuals to:

- prefer the status quo over making and implementing decisions to change,
- dislike losses more than they value gains,
- prefer certainty over variability,
- become overwhelmed when presented with too many choices,
- rely too heavily on the first information received,
- be influenced by the actions of peers,
- defer or disregard restrictive or bothersome actions, and

- perceive round numbers as more trustworthy and representing higher quality than other numbers.

These types of theories can and have been applied to a wide range of economic activities, such as:⁵

- **Automatic magazine subscription renewals.** Through inertia, under an automatic renewal option, people will tend to subscribe longer, even if they do not read the magazine.
- **Software defaults.** Due to inertia, status quo bias and perceived effort needed, people tend to “choose” the defaults embedded in the software—for example, not customizing the ribbon in Microsoft products—even if another option would better suit their needs.
- **Promoting fuel efficiency.** Through (perceived) competition, fuel economy stickers with estimated fuel cost and ranking of miles-per-gallon ratings, incent consumers to purchase more fuel-efficient automobiles.
- **Encouraging retirement savings.** To overcome inertia of not joining a retirement savings plan, and then to retain the inertia of participating, automatic enrollment and automatic contribution increases in retirement savings plans increase overall retirement savings rates and levels.

Behavioral economics theory applicable to health care insurance plans include:

- **Weight loss programs.** Using the effectiveness of personal commitments and the tendency of loss aversion, some online

vendors provide forums for public declarations of personal health goals or provide a mechanism for people to create a financial risk for themselves to meet personal health goals. For example, a person can pay the vendor a self-determined amount of money. If the person achieves a self-predefined goal (e.g., losing at least eight pounds in the next 60 days), the money is returned to the person. If the goal is not reached, the money is donated to a charity. In some cases, it is more effective for the money to be donated to an organization that is objectionable to the person. This provides tangible incentives for a person to achieve goals, or disincentives for not achieving goals. The goals and risk levels are self-determined and real.

- **Promoting better diet and nutrition.** In a buffet, people tend to take and eat more food if they are given larger plates, and people tend to take and eat more of the food that is provided near the beginning of the layout. People will tend to eat healthier from buffets with smaller plates and healthier options placed near the beginning of the food options.
- **Smoking cessation.** Loss aversion leads to the reduction of cigarette use when significant cigarette taxes are instituted.
- **Organ donation.** Based on inertia, presumed consent—an opt-out (as opposed to opt-in) process—for organ donations tends to increase potential donor consent rates.

Table 1 presents a summary of examples of possible applications of behavioral economics theory to health and welfare insurance plans.

Table 1
Sample Applications of Behavioral Economics Theories to Health Care Insurance Plans

Behavioral Economics Concept	Possible Health Care Insurance Application
Anchoring bias: People tend to rely too heavily on the first information received.	Design of open enrollment material (e.g., presenting the high-deductible consumer-driven health plan first, if that is the preferred option for the employer) Structure of provider listings and provider search results (e.g., showing higher-ranked or lower-cost providers first in a provider search)
The choice paradox: Offering people too many choices creates indecision and suboptimal decisions or decision avoidance.	Plan offerings on public Medicare and commercial health care plan exchanges (e.g., when employees are given an array of benefit levels, network options and supplemental benefits to choose from, offering predetermined “bundles” of coverage can reduce choice anxiety)
Prospect theory and loss aversion: People tend to prefer avoiding losses to acquiring gains.	Balance of and communication of cost-sharing provisions and employee contributions/premiums (e.g., this theory may explain why insureds may pay more in premium than the deductible difference for a lower deductible plan) Decision framework for voluntary benefit enrollment hospital indemnity and critical illness insurance (e.g., framing the benefit as helping cover the out-of-pocket costs associated with illness even though the benefit can be used for anything)

Behavioral Economics Concept	Possible Health Care Insurance Application
Certainty effect: People tend to strongly prefer certainty and are even willing to sacrifice income to achieve higher levels of certainty.	Balance of and communication of cost-sharing provisions and employee contributions/premiums (e.g., many insureds prefer copays to deductibles)
Present bias: People tend to give stronger weight to payoffs that are closer to the present time when considering trade-offs between two future events.	Design of health and wellness rewards programs (e.g., a series of immediate or intermediate rewards can be more effective in a weight loss program than a single long-term goal or reward)
Preference for round numbers: People tend to perceive round numbers as more trustworthy and easier to understand.	Premium and employee contribution rates (e.g., a monthly premium of \$240 versus \$239.57 is a less complicated number for a consumer to process)
Status quo bias: People tend to prefer the current state.	<p>Framework to incent subscribers to keep or change plans or carriers (e.g., automatically enrolling employees into an alternative plan when previous plan options are discontinued)</p> <p>Framework to incent employers to keep or change carriers (e.g., offer a renewal discount to employers to avoid carrier shopping)</p>
The goal gradient effect: People tend to complete a task if the task has been started for them.	<p>Open enrollment (e.g., prepopulating open enrollment material with known personal profile data, making a form look partially completed)</p> <p>Retention programs (e.g., personalized retention marketing materials showing that the company did the work to determine the “best fit” plan option, based on the consumer’s health care needs, with a simple “check the box” response option)</p>
Framing effect: People tend to react to choices differently depending on whether the choices are presented as losses or gains.	<p>Design of wellness incentives (e.g., some exercise programs offer rewards if goals are achieved while others offer penalties, such as the loss of a gym discount)</p> <p>Structure of one-way and two-way risk-based provider contracts (e.g., gain-only provider incentives may be less effective than gain-loss incentives)</p>
Relative positioning: People tend to be more interested in relative gains and losses than in absolute income and wealth.	Communication of provider quality-of-care scores to providers and to members (e.g., “relative to peers” is a more effective motivator than absolute number)
The bandwagon effect: People are more apt to agree with a proposition if they are aware others agree with it, regardless of the actual or self-perceived underlying value of the proposition.	Patient care decisions (e.g., influencing decisions by providing information such as “This is what the majority of patients in your situation decided” or “This is what the majority of physicians recommend for someone with your symptoms and diagnosis”)
Small probabilities: People tend to underreact to low-probability events.	Health care decisions regarding rare diseases (e.g., vaccine avoidance)
The Zeigarnik effect: People tend to remember uncompleted tasks more than completed ones.	Communication and impact of a wellness credit earned in the previous plan year (e.g., do people appropriately value the credit?)
Reciprocity: People tend to respond positively to friendly and cooperative actions; conversely, people tend to react nastily to hostile and brutal actions.	Care advocacy and benefit concierge services (e.g., automated responses and call center representatives using pleasant, respectful voices and scripts achieve higher member satisfaction ratings)

ENROLLMENT IN HEALTH INSURANCE EXCHANGES CREATED BY THE PPACA

Despite great coverage gains as a result of the implementation of the PPACA, an estimated 30 million people remain uninsured.⁶ Surprisingly, nearly half of the uninsured are eligible for some form of subsidized coverage. From a purely rational economic point of view, we would expect all consumers to assess their available choices and make optimal decisions given their

preferences and risk tolerances. As a result, we might conclude that those who remain uninsured do so because they have made an optimal choice to forgo the cost of insurance in exchange for taking the risk of paying for medical services on their own should the need arise.

But the evidence suggests very strongly that rational decision making is not the driving factor in remaining uninsured. An

issue brief from the Kaiser Family Foundation suggests that as many as 4.7 million of those who are uninsured have access to zero-dollar Bronze plans through the PPACA marketplace.⁷ In a purely rational world, it doesn't make sense for people to remain uninsured if a free coverage option is available to them.

Consider this extreme end of the choice spectrum where a consumer must decide between remaining uninsured and obtaining coverage without paying any premium. The choice to obtain coverage should be obvious, as they are better off on all key measures of health spending:

- **Up-front costs.** You can't beat \$0 premiums.
- **Cost of services.** Most Bronze plans have relatively high deductibles, which may be daunting for some consumers. But that's no worse than having no insurance coverage at all. In addition, all qualified PPACA plans cover certain preventive services, such as flu shots and mammograms, with no cost-sharing.
- **Catastrophic protection.** Something is better than nothing. Like high deductibles, high out-of-pocket maximums provide at least one layer of protection against large medical bills. Two-thirds of all bankruptcies filed in the United States cite medical issues as a key contributor.

The question we should be asking ourselves as actuaries is, why is this happening at such a large scale? Perhaps some of the decisions can be explained by behavioral economics principles. In a Commonwealth Fund survey of the uninsured,⁸ consumers who chose to remain uninsured were asked why they didn't try to obtain health insurance coverage through the PPACA marketplace exchanges. Many of the responses allude to underlying behavioral principles rather than purely economic calculations.

Let's look at the responses and the potentially relatable behavioral economics principles (Table 2).

These are by no means the only explanations for why some subsidy-eligible people remain uninsured. However, as actuaries we should strive to be aware that policies and models will never represent the full spectrum of human behavior.

PUBLIC HEALTH INSURANCE LITERACY AND BEHAVIORAL ECONOMICS-INSPIRED PRODUCT DESIGN

Health insurance is an area of significant uncertainty and misunderstanding for many. Actuaries have an important role in helping consumers interact positively with health insurance products, but actuaries may also need to think more deeply than the technical details we interact with daily. Product designs

Table 2
Possible Behavioral Economics Explanations for Uninsurance

<i>Survey Question: "What was the <u>main</u> reason you did not try to get health insurance through the marketplace?"</i>	
Answer Option	Behavioral Economics Concept
You did not think you could afford health insurance.	Anchoring bias. Initial impressions of affordability may have been based on early negative press on PPACA.
You did not think you needed health insurance.	Small probability. "It's not going to happen to me." Perhaps this kind of attitude reflects people's willingness to gamble with their own health. Bandwagon effect. People may choose not to pursue coverage if peers with similar demographic, cultural or political beliefs do not have coverage.
You did not think you would be eligible for health insurance.	Status quo bias. People prefer the status quo over making and implementing decisions to change. Remaining uninsured is easier than signing up for new coverage. Anchoring bias. Consumers may continue to have a pre-PPACA view of health insurance underwriting and not be aware of guaranteed issue requirements.
You were not aware of the marketplace.	Choice paradox. People tend to become overwhelmed when presented with too many choices. Consumers are inundated with advertisements from insurers and agents and may find it difficult to home in on the public marketplace, where subsidized coverage is most readily available.

Source: Rachel Fehr, Cynthia Cox, and Matthew Rae. *How Many of the Uninsured Can Purchase a Marketplace Plan for Free in 2020?* Kaiser Family Foundation, December 10, 2019, <https://www.kff.org/health-reform/issue-brief/how-many-of-the-uninsured-can-purchase-a-marketplace-plan-for-free/> (accessed July 12, 2020).

focused on aligning consumer incentives through higher cost-sharing or rewards for healthy behavior are effective, but not as effective as theory might predict (not to mention consumers can resent the first and ignore the second). This may be, in large part, due to widespread health insurance illiteracy.

A 2017 UnitedHealthcare Consumer Sentiment Survey found a significant, but perhaps not surprising, lack of knowledge about health insurance among the public.⁹ Only 9 percent of individuals surveyed understood all four of the following basic health insurance terms: “health plan premium,” “health plan deductible,” “out-of-pocket maximum” and “co-insurance.” In an environment where the majority of consumers do not understand key components of the products actuaries are designing, a new approach may be necessary. Using knowledge of behavioral economics to inform health insurance product design may provide a new path forward.

Increasingly, incentives and rewards are being introduced as alternatives to cost-sharing designs to promote desirable health behavior. This approach is especially pertinent in Medicaid programs, where cost-sharing and benefit incentive approaches may not be feasible. Although this is largely an untested area, there are some interesting first efforts that we can review.

We are beginning to see a new approach implemented in Medicaid plans. Section 4108 of the PPACA authorized grants to states to provide incentive to beneficiaries who participate in prevention programs and demonstrate changes in health risk and outcomes. These PPACA grants (enacted under the Medicaid Incentives for the Prevention of Chronic Diseases model) must be “comprehensive, evidence-based, widely available, and easily accessible.” Studies of the emerging impacts of these PPACA programs provide an interesting look at how the behavioral economics mechanisms that were employed in some cases are working.

A successful program in Wisconsin provided smoking cessation services to adult smokers enrolled in a cessation program, with some participants receiving incentives contingent upon participation in treatment and attainment of cessation goals, while a randomized control group received only treatment.¹⁰ Members were generally eligible to receive a maximum \$350 over 12 months, with pregnant participants eligible to receive \$595 over the course of pregnancy plus 12 months postpartum. Money was awarded for taking counseling calls and for biochemically verified abstinence. The study found that the incentive group had significantly higher smoking abstinence rates ($p < 0.0001$). Secondary outcomes observable in the early data included an increased use of cessation medications based on pharmacy records and an increased rate of self-reporting smoking status. Including all program costs, the cost per individual cessation was nearly \$1,100 lower for the incented group.

By understanding behavioral economics, actuaries can better explain, predict and promote consumer behavior.

At least two other states enacted similar smoking cessation plans. California reported a statistically significant increase in smoking cessation attempts, but without a corresponding decrease in inpatient admissions or emergency room visits. The California model offered less incentive money than the Wisconsin program, and also offered incentive payments only for taking counseling calls and not for verified six-month abstinence. A smoking cessation program in Connecticut offered money for verified abstinence—\$15 for up to 12 tobacco-free tests with a \$10 bonus for three consecutive tobacco-free tests. Connecticut found statistically significant decreases in inpatient spending during the program and also found that raising incentive payment amounts later in the study resulted in increased engagement.

The differences in program design and results from these programs provide a clearer picture on how the behavioral economics mechanisms of these programs are working. A Duke study of these initiatives found a few key recommendations on what worked well in these programs and presented some alternative ways to leverage behavioral economics.¹¹ They found:

- Providing tangible rewards (e.g., gift cards and other prizes) can be more effective than reduced cost-sharing, which may go unnoticed by members. The study cites a Kaiser Family Foundation focus group composed of Michigan Medicaid beneficiaries, which found they perceived immediate gift cards as more motivating to complete behaviors than future reductions in premium payments. The study also notes that “while behavioral economics research suggests that incentives framed as losses can be more effective than rewards [loss aversion], penalties in a financially disadvantaged Medicaid population could hinder access to needed care or discriminate against beneficiaries with certain health conditions.”
- Immediate incentives can be crucial to achieving effectiveness. A meta-analysis of incentives concerning smoking cessation found that a delay of more than one day between target behavior change (e.g., biochemical verification of smoking cessation) and incentive delivery was associated with a 50 percent reduction in effectiveness.
- Frequent, smaller rewards can be more effective than larger, one-time or annual rewards. In addition to providing more immediate incentives to beneficiaries, the former also

provides the program with more real-time data. One state changed a \$200 gym voucher to a monthly voucher program to enable more insight into how beneficiaries were sustaining behavior.

There are still more questions than answers about how these programs can work, both for Medicaid and for commercial or Medicare products, with these early Medicaid pilots serving as a proof of concept. Leveraging behavioral economics insights can be an effective tool to incent member behavior and may be a fruitful path forward as public literacy about health insurance products remains low and financial mechanisms for managing costs become increasingly difficult to use.

CONCLUSION

Behavioral economics theories are being used in the design of health insurance products and the broader health care system. Actuarial practice is enhanced by actuaries learning about and implementing these theories.

Behavioral economics can help people lead healthier lifestyles and better understand and appreciate their health insurance plans. As people change behavior, the health insurance system should become more efficient and cost increases should decline. The authors hope actuaries will embrace this nontraditional area of study. ■



Jeff Chanin, FSA, MAAA, is a partner at Mercer Health & Benefits LLC. He is currently sheltering at home with six other people and two dogs. He can be contacted at jeff.chanin@mercer.com.



Randy Herman, FSA, MAAA, is CEO and chief data officer at Deft Research. Besides working at Deft, Randy and his wife are currently running a day care center for their grandchild during the pandemic. He can be reached at rherman@deftresearch.com.



Tony Pistilli, FSA, MAAA, CERA, is director of actuarial services at Optum, leading actuarial services for Optum's Payment Integrity products. He can be reached at anthony.pistilli@optum.com.



Brian Plaskow, FSA, MAAA, is an associate vice president of actuarial services at Molina Healthcare. He leads the actuarial work for the Marketplace Individual Exchange products. He can be reached at brian.plaskow@molinahealthcare.com.

ENDNOTES

- 1 Behavioral economics. Lexico, https://www.lexico.com/en/definition/behavioral_economics (accessed August 26, 2019).
- 2 Thaler, Richard H., and Cass R. Sunstein. 2009. *Nudge*. New York: Penguin Books, p. 6.
- 3 Ariely, Dan. 2008. *Predictably Irrational*. New York: Harper, p. xx.
- 4 Supra note 2, p. 4.
- 5 The examples briefly described in this section are from Thaler and Sunstein.
- 6 Tolbert, Jennifer, Kendal Orgera, Natalie Singer, and Anthony Damico. *Key Facts About the Uninsured Population*. Kaiser Family Foundation, December 13, 2019, <https://www.kff.org/uninsured/fact-sheet/key-facts-about-the-uninsured-population/> (accessed July 12, 2020).
- 7 Rachel Fehr, Cynthia Cox, and Matthew Rae. *How Many of the Uninsured Can Purchase a Marketplace Plan for Free in 2020?* Kaiser Family Foundation, December 10, 2019, <https://www.kff.org/health-reform/issue-brief/how-many-of-the-uninsured-can-purchase-a-marketplace-plan-for-free/> (accessed July 12, 2020).
- 8 Gunja, Munira Z., and Sara R. Collins. *Who Are the Remaining Uninsured, and Why Do They Lack Coverage*. The Commonwealth Fund, August 28, 2019, <https://www.commonwealthfund.org/publications/issue-briefs/2019/aug/who-are-remaining-uninsured-and-why-do-they-lack-coverage> (accessed July 15, 2020).
- 9 UnitedHealthcare. 2017. *UnitedHealthcare Consumer Sentiment Survey*. https://newsroom.uhc.com/content/dam/newsroom/2017_UHC_Consumer_Sentiment_Survey_-_Executive_Summary_10-05-2017_-_FINAL_d39i76.pdf (accessed July 15, 2020).
- 10 Wisconsin Department of Health Services. 2016. *Medicaid Incentives for the Prevention of Chronic Disease*. Madison: University of Wisconsin, <https://www.dhs.wisconsin.gov/publications/p01700.pdf> (accessed July 15, 2020).
- 11 Saunders, Rob, Madhu Vulimiri, Mark Japinga, William Bleser, and Charlene Wong. 2018. *Are Carrots Good for Your Health? Current Evidence on Health Behavior Incentives in the Medicaid Program*. Duke Margolis Center for Health Policy.