

# The Impact of Behavioral Economics on Retirement Plans

Throughout the retirement process, individuals are in a continuous state of making decisions. From deciding when to start deferring money to a 401(k) plan, to figuring out how retirement money should be invested and when to rebalance, to choosing which date to commence Social Security benefits, we are always making choices. Wherever there is choice, behavioral economics plays a role. This article introduces concepts of behavioral economics and discusses their impact on retirement plans. It draws on research from noted behavioral economists to showcase not only what “irrational” retirement decisions we make, but also how employers are combating them through automation features, premixed portfolios and the like. Finally, it concludes with how behavioral economics principles can be applied to create future 401(k) features.

by **Rob Austin** | *Aon Hewitt*

Imagine for a moment that you’re a fly on a wall observing a social science experiment. An individual saunters past you and puts on a digital headset resembling something akin to 3-D movie glasses, but it covers the entire top of the head and is tethered to a computer through a long umbilical cord in the back.

“Can you see yourself in the mirror in front of you?” asks the researcher. “If so, please turn around 180 degrees.”

Some participants are more graceful than others in their pirouetting, but all face the back of the room and then turn around again to receive a few simpler instructions: “Nod in front of the mirror,” “Tilt your head to the side” and so forth. These instructional dance calls last for a minute.

As the headsets come off, participants are asked to imagine that they just unexpectedly received \$1,000 and were asked to allocate it to among four options:

1. Use it to buy something nice for someone special.
2. Invest it in a retirement account.
3. Plan a fun and extravagant occasion.
4. Put it into a checking account.

Half of the participants allocated more to the retirement accounts than the other half. Much more. Like double the amount. Why did this group devote more of their funds to retirement? The answer lies in what they saw in their headsets.

Hal Hershfield, a social scientist at New York University, and six of his colleagues (Hershfield et al., 2001) hypothesized that part of the retirement savings crisis in this country stems from the fact that individuals have a hard time visualizing themselves in retirement. Our brains are conditioned to place a greater weight on near-term gratification at the expense of long-term gain. To combat this, Hershfield decided to harness the power of technology to help partici-

pants see what they might look like as a retiree. In the headset of the group that saved more to retirement was a computer-generated digital representation of themselves as a 70-year-old. The other half of the participants saw merely an avatar of themselves at their current ages, and they acted as the control group.

Hershfield and his researchers took the experiment further and determined that it was necessary for participants to see what they may look like at the age of 70 and not just some random septuagenarian. For retirement savings to increase, there needs

This research is part of an emerging and growing field called *behavioral economics*—a discipline that is located at the intersection of neoclassical economics and psychology. Studies in this area generally answer at least one of two questions: (1) Why do people make suboptimal choices? and/or (2) what conditions can be changed to improve the outcome?

Why this field of study is important to retirement plans is clear. Simply put, as defined benefit pension plans have faded away and been replaced by defined contribution plans, participants

paperwork and start receiving checks throughout their golden years. The simplicity of the process makes it so there is not much room for people to make irrational decisions.

Contrast that with the choices and decisions a defined contribution participant faces: When should I start saving? How much should I save? Should I put this into a pretax account or a Roth account? Into which fund or funds should I invest? When should I rebalance? When do I change my future allocations? Is this fund worth the fees it is charging? Should I roll a balance from a prior employer into this plan? These are all questions the individual must contemplate before even deciding to retire.

Retiring from the workforce begs the defined contribution participant to answer even more questions. Should I reallocate my portfolio to mitigate risk? How much should I take out each month? Will the money last until I die? Should I keep the money in the plan or roll it over? Should I purchase some longevity insurance? The list goes on.

So, whenever there are questions, behavioral economics seeks answers. This article is going to explain some traits of behavioral economics. It's structured to showcase some research and then describe its applicability to the retirement space. Finally, it concludes with how behavioral economics could be designed to create the defined contribution plan of tomorrow.

### **Trait One: Anchoring**

To understand the concept of anchoring, be a willing participant in this short, two-step experiment: (1) Say the

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to be that connection between the current self and the future self. Fortunately for those of us without expensive immersive virtual reality environments, the research team also showed that it was enough just to use a little software modeling to add some wrinkles and a touch of gray hair for participants to have a pretty good idea of what they'll look like as a retiree. Once participants had this image, they tended to save more toward retirement than those who didn't see their future self.

are asked to make exponentially more decisions. In most defined benefit pension plans, participants never need to make a choice until it comes to retirement. Once they decide to retire, participants generally are asked to make one decision: In what form do you wish to receive your benefit? They usually are provided with explanations of the flavor of annuities and are shown a corresponding set of numbers. They check a box, add a few signatures, return their

word “silk” five times as quickly as possible. Silk. Silk. Silk. Silk. Silk. (2) What does a cow drink?

Chances are you thought that the answer was milk. Cows drink water. It’s an understandable error. After saying ilk so often in silk, you have primed your brain to think of other words that sound like it. So when you hear cow and drink, it is not a leap to the word milk. You were already “anchored” on ilk words.

For a far more robust study on anchoring, consider the research done by Dan Ariely, a behavioral economist and the best-selling author of *Predictably Irrational*, where he asked research participants to take part in an auction (Ariely et al., 2003). Of course, since this was a research experiment, it was no ordinary auction. Before it started, the participants were asked to write down the last two digits of their Social Security number. While the first few digits of Social Security numbers are based on geography, it is fairly safe to say that the last two digits are about as random as any numbers could be.

Participants were then asked to participate in the auction. The averages of the results are shown in the table.

Two things should jump out at you. First, people who had higher last digits of their Social Security numbers were willing to pay more than those with lower numbers. Second, the values in the figure are not completely random. Nearly every group thought the cordless keyboard was more expensive than the cordless trackball—and most thought it was around twice as much. Everybody thought the 1996 wine was worth more than the 1998 one. What Ariely’s study shows is that an initial piece of information—in this case, the last two digits of the Social Security number that the participant wrote down—can influence decision making later on.

How can we use anchoring to help improve decision making? To find that answer, consider research by Eric Johnson and Derek Goldstein (Johnson and Goldstein, 2009). Their research showed that different countries have organ donorship rates that fall into two distinct categories:

1. Countries with low percentages—Denmark with 4%, United Kingdom with 17% and Germany with 12%
2. Countries with very high percentages—Austria, France, Hungary, Portugal and Poland each had a percentage over 99%.

Some variability between countries is to be expected, but a gulf between the groups of this magnitude should clue you in that something else is going on. The first group of countries requires individuals to opt in to being an organ donor. Only those who actively take action are included. The countries in the second group are structured conversely. Residents of these countries are required to opt out of being an organ donor. What Johnson and Goldstein’s research helps illustrate is the power inertia has in anchoring our decision making.

Retirement plan sponsors have taken a page from Johnson and Goldstein’s research by implementing automatic enrollment in their plans. By some accounts (Aon Hewitt, 2012), 55% of companies enter newly hired employees into their defined contribution plan unless they opt out. The gap between the participation rates of companies that automatically enroll versus those that require active enrollment is not as big as what Johnson and Goldstein found for organ donor participation in countries, but it is still noteworthy. According to some studies (e.g., Aon Hewitt, 2011), the average participation rate for employees who were subject to automatic enrollment is 85%. This is fully 18 percentage points higher than the participation rate for employees who were not subject to automatic enrollment.

Unfortunately, the silver lining of increased participation in plans with automatic enrollment is not without its touch of gray. The same Aon Hewitt study found that the average savings rate for participants who were subject to automatic enrollment is 100 basis points lower than the average savings rate for participants who were not subject to automatic enrollment, 6.8% versus 7.8%, respectively. Over time, this difference can lead to a 15% reduction in the amount of retirement income.

The main culprit for the difference in the average savings rate between plans with automatic enrollment and those without is, once again, anchoring. Once plan sponsors decide to implement automatic enrollment, they must decide the default rate for participants who passively join the plan. The overwhelming majority of plans set their default rate at 3% (Aon Hewitt, 2012). While some plans combine automatic enrollment with automatic contribution escalation, 60% of all plans do not (Aon Hewitt, 2012). Consequently,

employees who enter the plan through automatic enrollment have their savings rates remain flat.

### **Trait Two: Loss Aversion**

In his 2003 book *Moneyball*, Michael Lewis chronicles how the Oakland A's general manager Billy Beane used a different set of analysis to draft players who would become the heart of their 2002 division championship winning team. The book was adapted to an Oscar-nominated movie in 2011, and in one scene, Beane, played by Brad Pitt, tells one of his struggling players, Eric Chavez, to stop swinging at bad pitches.

"You get on base, we win. You don't, we lose," Beane says. "And I hate losing, Chavy. I hate it. I hate losing more than I even want to win." (Miller, 2011)

There is perhaps no better illustration of the concept of *loss aversion* than Pitt's words, "I hate losing more than I even want to win." The pain we feel from getting rid of something that we already have can often be more than the happiness we feel with obtaining something. Loss aversion first gained prominence through a paper by Daniel Kahneman and Amos Tversky (Kahneman and Tversky, 1979) and is a main reason the former won a Nobel Prize in economics in 2002.

Consider a recent study that Ziv Carmon and Dan Ariely (Carmon and Ariely, 2000) performed on unsuspecting students at Duke University. Even casual observers to the sport of basketball know that this school has a fierce rivalry with the University of North Carolina at Chapel Hill, fueled in part by both schools' success on the hardwood and exacerbated by the proximity of the universities—fewer than ten miles separate the two schools. Duke students are well-known for waiting weeks on end in makeshift tents to try to obtain basketball tickets. The conditions in the tents can be miserable, with the school conducting occasional random checks to verify the students are still physically present "in line" for the tickets. Students who miss a check-in are out of luck. Suffice it to say that all students who wait in these tents are excited about getting the tickets and all really want to attend the game.

Sadly, because there are more campers than tickets, not everyone who sleeps in the tent will be attending the game, so the school holds a lottery to determine which of the students

in the tents will win the tickets. Carmon and Ariely befriended a few of the campers in the days before the ticket lottery was held. Some of the people Carmon and Ariely knew were lucky enough to win the tickets and some were not. Carmon and Ariely then asked the group of the former at what price they would be willing to sell their tickets. Similarly, they asked the latter group how much they would be willing to pay for a ticket to the game. Now, keep in mind, traditional neoclassical economics would argue that these groups both had the same demand for these tickets and therefore the prices the sellers would charge should be similar to the prices the buyers would be willing to pay.

They weren't even close. The average "sell" price was \$2,400 and the average "buy" price was \$175. Carmon and Ariely's research shows firsthand that once we have something, we don't want to part with it.

The same idea holds true for investing, particularly in 401(k) plans. Aon Hewitt's 401(k) index tracks the movement of investors' buying and selling habits. It consistently shows that in months following market losses, participants are more likely to decrease the amount they are investing in equities. Months following market gains see a slight uptick in participant equity exposure, but not to the same degree. In other words, investors tend to be quick to take action when there is a painful loss but are less likely to take action when they have a chance to win.

Over time, these actions of selling after losses and sometimes buying after gains can have a detrimental impact on the overall portfolio. DALBAR (DALBAR, 2011) published a research piece that analyzed the investing behavior of individuals over the 20-year period that ended on December 31, 2009 and compared it to industry benchmarks. The results were not rosy. For equity returns, the average investor earned 3.83% per annum whereas the S&P 500 returned 9.14% per year. Bonds fared no better. The average investor earned 1.01% compared to the Barclay's Aggregate Bond Index return of 6.89%. Putting these returns into perspective, if an investor were given \$100,000 on January 1, 1990 and followed the typical investor's habits, the inflation-adjusted value of that \$100,000 as of December 1, 2009 would be \$82,288. Had the investor simply followed index funds, the inflation-adjusted value would be \$292,329. So, in essence, by trying to

## TABLE

## Influence of Social Security Number on Auction

	Range of last two digits of Social Security number					Correlation
	00-19	20-39	40-59	60-79	80-99	
Cordless Trackball	\$ 8.64	\$11.82	\$13.45	\$21.18	\$26.18	0.42
Cordless Keyboard	\$16.09	\$26.82	\$29.27	\$34.55	\$55.64	0.52
Design Book	\$12.82	\$16.18	\$15.82	\$19.27	\$30.00	0.32
Neuhaus Chocolates	\$ 9.55	\$10.64	\$12.45	\$13.27	\$20.64	0.42
1998 Cotes du Rhone Wine	\$ 8.64	\$14.45	\$12.55	\$15.45	\$27.91	0.33
1996 Hermitage Wine	\$11.73	\$22.45	\$18.09	\$24.55	\$37.55	0.33

avoid losses, the typical investor locks them in.

### Trait Three: The IKEA Effect

Imagine for a moment that you're in need of a piece of furniture, say a bookshelf. On one end of a spectrum, you could decide to build this bookshelf from scratch by carefully measuring, cutting, hammering and staining wood. On the other end of the spectrum, you could go and purchase a bookshelf that was premade. In the middle is a third option: the ready-to-assemble product that provides you with materials that are precut, sanded, painted and often predrilled for a quick construction. This ready-to-assemble option is the bedrock on which IKEA has built its status as the world's largest furniture retailer.

Beyond the convenience of the ready-to-assemble option lies something deeper. Research has shown that by requiring some labor, we gain appreciation for the product. Michael Norton, a professor at Harvard Busi-

ness School, and a team of researchers have shown repeatedly that there is an increase in the valuation of self-made products. In one study (Norton et al., 2001), Norton and his team traveled to their local IKEA store and purchased a number of small black file storage boxes. The research team assembled some of the boxes and provided them to half of the study participants to examine. This group was then asked to come up with a price they were willing to bid to keep the box. The other half of the participants received an unassembled box and was first asked to assemble it and then asked to come up with a price that they would bid to keep the box. This second group of participants, the do-it-yourself group, was willing to pay on average twice as much as the group that merely examined the boxes.

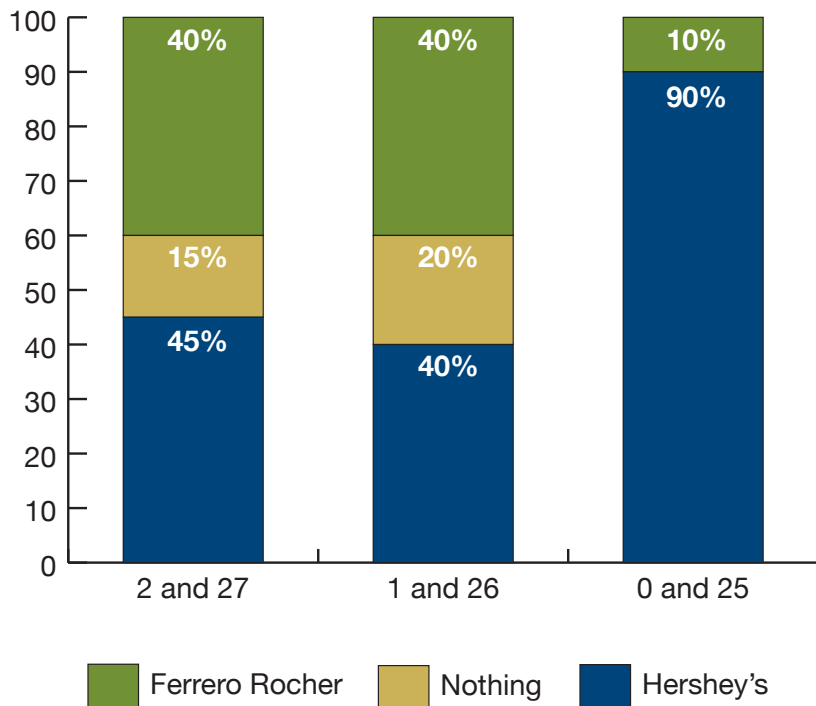
Norton and his team have dubbed this the *IKEA effect* in honor of the Swedish consumer giant, but they easily could have called it the *Build-A-Bear effect* in homage to the mall mainstay that

charges a premium for constructing a stuffed animal while passing assembly costs onto the consumer. Or, they could have called it the *egg-cracking effect*. Cake mixes in the 1950s initially were unsuccessful because they oversimplified the life of the typical American housewife by reducing the amount of labor needed. In response, manufacturers swapped out the dry eggs and started requiring people to add eggs to the mix. This slight change—a small increase in labor—was the crucial step to ensure that cake mixes would be successful (Shapiro, 2004).

Many defined contribution plans are missing the ready-to-assemble option and therefore not capturing the power of the IKEA effect. Instead, they are asking their participants to either choose the defaults of automatic enrollment (assuming the plan has that feature) or build their retirement nest egg by selecting a contribution amount and then figuring out their allocation percentages among a number of funds.

**FIGURE**

**Impact of Price vs. Free on Chocolate Choice**



The explosion of target-date funds over the past several years has aided participants, but little has been done to address an easy-to-navigate way to participate in the plan and choose an appropriate savings level.

It's important to note that for the IKEA effect to work properly, the labor cannot be too extensive. When there are too many choices, analysis paralysis kicks in. According to some research (Redelmeier and Shafir, 1995), simply asking a participant to make one more choice among three options can yield significantly different results than if only two options

are presented. In this particular research, doctors were presented with facts about a patient with hip trouble. The doctors recommended hip replacement surgery. Then, before the surgery, the doctors were told about an alternative drug therapy that showed promising results. Nearly three-quarters of the doctors thought they would try the alternative first. Interestingly, if the doctors were presented the same fact pattern, but told there were two drug therapies available, the number who would try the nonsurgical approach dropped to nearly half.

**Trait Four: The Power of Nothing**

Imagine you're walking down the street and you spot a table with a handwritten sign on it saying "Chocolate for Sale." The table has two types of chocolate: a Hershey's Kiss for 2¢ and a Ferrero Rocher chocolate for 27¢. Which would you choose?

What if the prices were instead the Hershey's Kiss for 1¢ and the Ferrero Rocher for 26¢? Would your answer change?

Odds are, you didn't change your choice between the first and second question. However, if we continue the trend once more, you may find yourself changing your selection. Kristina Shampanier, a researcher from Massachusetts Institute of Technology, and a team of social scientists conducted this very experiment. They made the Hershey's Kiss available for free and charged 25¢ for the Ferrero Rocher. In other words, they kept the difference between the two chocolate offerings exactly the same—25¢—but wanted to see if offering something for free would change the attitudes and selection (Shampanier et al., 2007). Choices are shown in the figure.

Their research shows that free is a special price and tends to throw standard economic theory off its tracks.

Free can also be a powerful factor when it comes to time. It's easier to allow the status quo to take place than to spend energy. James Choi, a professor of finance at Yale, and a cadre of co-researchers (Choi et al., 2001) have pointed out that plan participants often will take the path of least resistance in 401(k) plans. In response to knowing

that their savings rates are too low, many plan participants will state that they intend to raise their contribution rates. However, unless an employer offers them a low-effort way to save more through, say, automatic contribution escalation, few of these participants will ever increase their deferral rates.

We also see this path of least resistance with investing. Premixed portfolios of 401(k) plans including target-date and target-risk funds require participants to devote little attention. The average portfolio holds nearly 40% of assets in these funds—over a 14 percentage point increase in the past few years (Aon Hewitt, 2011).

### Trait Five: Availability Heuristic

Forty years ago, a young director by the name of Steven Spielberg was hired by Universal Studios to turn Peter Benchley's novel *Jaws* into a major motion picture. Striking the fear of shark attack into millions with Spielberg's expert storytelling and composer John Williams' haunting tuba line of E, F, E, F, *Jaws* became what is widely considered to be the first summer blockbuster.

Sensationalism aside, shark attacks kill only 5.5 people in the world on average per year. In America, the number drops to less than one—0.92 to be exact. Plenty of other things claim more lives. For example, trampolines (1.1 deaths per year), vending machines (2.06 deaths per year) and riding lawn mowers (5.22 deaths per year) all have higher instances of death. So why is it that we think of sharks as the blood-thirsty killers and not, say, the John Deere lawn mower in the backyard?

The answer lies in the fact that we can readily think of a shark attack, mostly thanks to Spielberg and his mid-1970s movie. It's tough for us to conjure up an example of somebody who died at the hands of a vending machine. This showcases what researchers term the *availability heuristic*, or the way our judgment is clouded and influenced by how easily we can think of an example.

According to Aon Hewitt, six out of every ten participants own company stock in their 401(k) plan when it is available (Aon Hewitt, 2011). Part of the reason the number is high is due to some companies having that as the default match option, but another part of it is attributable to the availability

heuristic. It is easier for participants to know about their own employer than another company.

Sometimes it is easy to plant the heuristics in people; indeed, we saw that *Jaws* has. Companies now are starting to communicate to participants what their 401(k) plan needs to be in order to have an adequate retirement. Others are establishing rules of thumb for what an average savings rate needs to be to reach retirement adequacy (Aon Hewitt, 2013).

### Putting It Together: The Auto(k) Plan

It was not too long ago when concepts such as automatic enrollment and target-date funds would have seemed far-fetched. It would have seemed foreign to the pioneers of 401(k) plans to have individuals enter a plan without an election and be invested in a portfolio that changed funds and allocations automatically without their approval or even knowledge. However, in retrospect, we can see why behavioral economics can help explain why these features are now commonplace. With that as a backdrop, realize that some of the notions that follow may seem mind-boggling now but could be routine later. As you read about this plan, look for examples of anchoring, loss aversion, the IKEA effect, the power of nothing and the availability heuristic.

This plan of the future, which we will call the *Auto(k) plan*, works as a four-step process:


1. Participants who sign up for this feature set a long-term goal for their financial target after being shown the perils of inadequacy. For example, the plan may say that saving anything less than 11 times the final pay at retirement means that something will need to be cut from the retirement spend.
2. Using the long-term goal of 11 times pay, intermediary goals are set. For example, an investor who is aged 25 and just starting off may need to have 0.12 times her pay in her account at the age of 26 and 0.25 times her pay in her 401(k) account in two years when aged 27.
3. An initial savings rate and investment mix is set to help meet this short-term goal. In our example, it could be that the 25-year-old starts saving 10% of pay into an account that is 75% equities and 25% fixed income.
4. Periodically, the savings mix is compared against a

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terms of losses may encourage more action and acceptance. Also, because the plan is set up to adjust automatically the portfolio or contribution amounts, there is less chance that the Auto(k) participants will allocate money out of equities when they have a correction.

- *IKEA effect*: Employees would need to sign up for the Auto(k) feature by taking an initial small action.
- *Power of nothing*: Once established, the Auto(k) would require little attention from the participant. Actions would happen automatically.
- *Availability heuristic*: Employees can easily see if they are “on track” for retirement. 

target and, if needed, the investment mix or the asset allocation automatically is changed in response. In our case, suppose after one year, our investor has 0.15 times her pay in her account. Since that exceeds the 0.12 that was targeted, either the investment mix becomes less equity focused, the contribution amount is decreased, or the person can use the gains to retire earlier or with more retirement income. Conversely, if the account has only 0.10 times her pay at the age of 26, either the investment mix will become more weighted toward equities or the contribution amount will increase.

As a means of review for the concepts presented in this article, let's cover the behavioral economics concepts that are featured in this Auto(k) concept:

- *Anchoring*: By first establishing a very large goal of retirement savings, participants are accustomed to thinking big numbers. Further, in order to meet the ultimate goal, participants likely will need to be saving initially at a rate more robust than they may otherwise choose.
- *Loss aversion*: Framing the ultimate retirement goal in

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