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# We are predictably irrational

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## Introduction

I would first like to thank Bob Morrison for inviting me to speak with you at the 2012 Allen D. Leman Swine Conference about behavioral economics and some of the lessons it has that can improve both professional and personal decision making. I would also like to thank Drs. Jim Lowe, Gordon Spronk, and Lisa Tokach for agreeing to share their perspectives on the applicability of these lessons to your businesses.

I will start with a confession. Any claim to fame I may have in life is as an agricultural rather than behavioral economist. The primary focus of my research is the profitability, risk, and regulation of emerging agricultural technologies. The technologies that have received most of my attention over the past fifteen years are genetically engineered crops. I have however dabbled in other areas including technology adoption and human resource management in swine production.

While I do not label myself as a behavioral economist, I have increasingly been drawn to the work of luminaries in the field like Daniel Kahneman (2002 winner of the Nobel Prize in Economics) in order to better understand risky and strategic decision making. Since 2002, I have taught a strategic decision making course that incorporates ideas from behavioral economics. I have also had the opportunity to share lessons from behavioral economics with K-12 educators from across the state at the annual Conference on Teaching Economics and Personal Finance (CTEPF). I was first struck by the thought that agricultural producers and professionals could potentially benefit from these lessons as much as if not more than my Ph.D. students and K-12 educators during my preparation for the 2011 CTEPF conference, which made Bob's invitation to speak quite timely.

## Economics vs. behavioral economics

Economics is preoccupied with the question: What *do* people do? A fundamental assumption used to answer this question is that people are rational. What I mean by rational can be illustrated fairly simply: If you tell me you like pork more than beef and beef more than chicken, then I can surmise that you like pork more than chicken. If this presumption is not correct, the foundations upon which economics stands starts to crumble. Unfortunately for economics, a

parade of clever individuals has shown that there are many predictable situations where rationality fails.

Economics is also preoccupied with the question: What *should* people do? Of course the answer to this question depends on what an individual hopes to accomplish. Still, a key lesson from economics is that when people are rational they often *do* what they *should* to accomplish their goals. When rationality fails however, it becomes easier to make decisions that will not help accomplish their goals.

What distinguishes behavioral economics is a belief that economics can benefit from a more realistic psychological foundation. While psychology played an important role in the early development of economics, economists tend to have an inferiority complex when it comes to the hard sciences, which lead the profession to shun psychology and other social sciences due to a perceived lack of methodological rigor. By embracing rather than shunning psychology, behavioral economists are developing a better understanding of when *we are all predictably irrational* and what we can do about it.

## Examples of predictable irrationality

The rest of my talk will walk through some examples that illustrate how people are often predictably irrational. I will discuss how this irrationality can lead to bad decisions. I will also discuss some interesting research that sheds light on why we are irrational or how we might try to avoid being irrational. During this discussion, I have invited Drs. Lowe, Spronk, and Tokach to interject with their own thoughts and experiences on when you might be prone to predictably irrational decisions that could be detrimental to your professional or personal success.

## Winner vs. loser

I will begin with an example adapted from a 1981 *Science* article by Daniel Kahneman and his colleague Amos Tversky. Suppose a new disease threatens the lives of 2,400 pigs in your finishing barn.

*Choice 1: If you could choose between a treatment (A) that would save 800 lives, or (B) one that would save all 2,400 lives with a one-third chance and none with a two-thirds chance, which would you choose?*

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I encourage you to write down your choice if you happen to have pen and paper handy before considering an alternative one.

*Choice 2: If you could choose between a treatment (C) that would result in 1,600 deaths, or (D) one that would result in 2,400 deaths with a two-thirds chance and no deaths with a one-third chance, which would you choose?*

Again, I encourage you to write down your choice before I discuss both further.

Choosing (A) in Choice 1 yields a certain survival rate of one-third and death loss of two-thirds, as does choosing (C) in Choice 2. Alternatively, choosing (B) in Choice 1 yields an uncertain average survival rate of one-third and death loss of two thirds, as does choosing (D) in Choice 2. Therefore, Choices 1 and 2 are exactly the same in terms of potential outcomes and rationality predicts that you would choose (A) and (C) or (B) and (D). Choosing (A) and (D) or (B) and (C) would be irrational. However, when Tversky and Kahneman presented a similar choice to individuals with peoples' lives at stake instead of animals, 72% chose (A), while 78% chose (D).

What did you choose? My guess is that many of you would be most comfortable with the certain outcome offered by (A) and (C). However, you would in fact choose (D) if presented with a choice between (C) and (D).

We could spend time critiquing this result. Many economists have only to find that it is robust. When people face a risky choice, they make safer decisions when the outcomes are presented in terms of what they can win and riskier decisions when the outcomes are described in terms of what they could lose.

Now that you know that your choices could be influenced by whether you think you have a chance to win versus lose, what can you do to be sure you are making the right one? This is a tough question to answer, but the best piece of advice appears to be to slow down and take what time is available to carefully evaluate your options. The more deliberative you are, the less likely you are to be influenced by things that don't really matter. Of course, this can be difficult to do when time is of the essence.

### Power of illusion

The next example draws from research conducted by Dan Ariely, another notable behavioral economist, and his book *Predictably Irrational*, which contains many interesting and entertaining examples that I will not have time to talk about.

Suppose I offer you a choice of subscriptions to *Journal of Swine Health & Production (JSHAP)*:

(A) 12 month internet only subscription for \$60,

(B) 12 month print only subscription for \$130, or

(C) 12 month internet and print subscription for \$130.

My guess is that if you are interested in subscribing to the journal, you would choose option (A) or (C). You can save money with (A) if you don't mind reading online or having to print out articles. While (B) gets you a hardcopy for more money than (A), (C) gets you internet access and a hardcopy for the same amount as (B). Since no one is likely to choose (B), why not just offer a choice between (A) and (C). Does it matter?

Dan Ariely tried this with MBA students at MIT offering the *Economist* magazine instead of *JSHAP* for obvious reasons. When he offered all three choices, 84% chose the package deal with the internet and print subscription, and no one chose the print only subscription as predicted. When he presented students with only (A) and (C), only 32% took the package deal, which suggests that more than half of the students were irrational. Equally important, this example helps explain why the *Economist* so generously offers readers three rather than two subscription choices. By doing so, they are able to create an illusion of added value that draws people to the higher priced subscription.

The marketers at the *Economists* are not the only ones aware of these types of irrational choices. Stop by any retailer and you are bound to find products that are marked down from the suggested retail price printed on the package. Is this because the retailer is looking to give you a good deal or is it because the retailer wants to give you the illusion of getting a good deal? This is an example of what behavioral economists call anchoring. With anchoring, people are presented with an initially high price in order to create the illusion of greater value. Whether or not an illusion is intended, if you are unaware of it, you are more likely to succumb — buying things you really don't want or paying more than you intended.

### Instant gratification

My next example is drawn from research by Samuel McClure, David Laibson, George Loewenstein, and Jonathan Cohen that was published in *Science* in 2004. Consider the following two choices:

*Choice 1: Would you prefer (A) a \$15 Amazon gift certificate today or (B) a \$20 Amazon gift certificate in one month?*

*Choice 2: Would you prefer (C) a \$15 Amazon gift certificate in one month or (D) a \$20 Amazon gift certificate in two months?*

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These two choices are identical in that you can get an extra \$5 if you are willing to wait another month, which suggests a rational person would choose (A) and (C) or (B) and (D). However, most people choose (A) and (D). What is different about these choices and the source of apparently irrational behavior is that you can get the \$15 gift certificate immediately for Choice 1, while you have to wait a month for Choice 2.

This is one of many examples that show people are prone to making choices that result in instant gratification, even if these choices are contrary to their longer term interests. My guess is that few of you are really surprised by this result and may even be wondering how something so obvious could ever end up in such a prestigious publication as *Science*.

This research is important not because it shows people choose instant gratification, but because it shows a link between how our brains work and our choice of instant gratification. This was accomplished by having people make choices while their brains were scanned using functional magnetic resonance imaging. These scans revealed that the mesolimbic dopamine system in the brain only responded to immediate rewards, while the fronto-parietal system responded equally to all rewards. While the mesolimbic dopamine system is associated with emotional responses, the fronto-parietal system is associated with analytic responses.

These results are disconcerting because they suggest we may be hardwired to make irrational choices like not saving enough for retirement. The good news is that there appear to be relatively painless ways to short circuit this wiring. Research shows that many employees want to participate in employer sponsored 401K retirement plans, even though they often choose not to enroll. However, participation can be increased substantially if employees are required to opt out of rather in to these plans.

Analogous results have been found with fertilizer use by Kenyan farmers. Many Kenyan farmers say they plan to use fertilizer, but then don't even though it would be more profitable. The most common reason cited for not using fertilizer is affordability, which has been attributed to an inability to save enough to cover its cost at planting. To get around this obstacle, researchers (Esther Duflo, Michael Kremer, and Jonathan Robinson) offered to sell fertilizer vouchers at harvest with free delivery at planting, which gave farmers the opportunity to commit to using fertilizer when they could most afford it. This program did in fact increase fertilizer use substantially.

### Intentions matter

The final example will look at an important lesson for strategic behavior. This is one of ten examples discussed by Jacob Goeree and Charlie Holt in their 2001 *American Economic Review* article.

Suppose you are an employer and your employee, who was scheduled to work the weekend, has now asked for it off.

*Employer's Choice: Do you (A) give the weekend off or (B) not give the weekend off?*

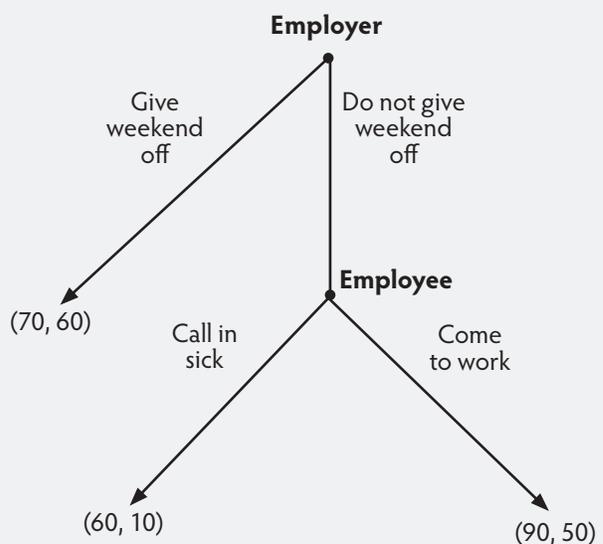
If you give the weekend off, you will have to find some other way to get the work done. If you do not give the weekend off, then the employee has a choice to make.

*Employee' Choice: Does he (C) come to work as scheduled or (D) call in sick?*

Figure 1 shows a decision tree for the Employer's and Employee's choices. This decision tree includes the rewards for each in parentheses based on their choices. The first reward in the parentheses is the Employer's, while the second is the Employee's. For example, if the employer gives the weekend off, the employer receives 70 and the employee receives 60. While I have embellished Goeree and Holt's story so it is less abstract, I have kept the monetary rewards they used for the choices the same. I refer to this as a strategic decision problem because the employer's choice influences the employee's reward and the employee's choice can influence the employer's reward.

Based on these rewards, the employer is happiest if the employee works (gets 90 instead of 70 or 60). The worst thing for the employer is if the employee didn't get the weekend off and then calls in sick (gets 60 instead of 90 or 70). The employee is happiest with getting the weekend off (earns 60 instead of 10 or 50). If he doesn't get the week off, he would rather work than call in sick (gets 50 instead of 10). Rationality dictates that the employer will choose not to give the weekend off and the employee will choose to come to work as scheduled, which is indeed the outcome found by Goeree and Holt 88% of the time.

Figure 1:



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You are probably asking: What is the big deal? People are rational and that is a good thing. While this is true, Goeree and Holt also explored the decision problem illustrated in Figure 2. Figure 2 is identical to Figure 1, with one exception. If the employee calls in sick, his reward is 48 instead of 10, which is only slightly smaller than his reward from choosing to work if he doesn't get the weekend off. Does this matter?

It turns out that it does. Rationality still says the employer will not give the weekend off and the employee will come to work, but this only happened 36% instead of 88% of the time. It is also worth noting that with the rewards in Figure 2, the employer chose to give the employee the weekend off 32% of the time. This only occurred 12% of the time with the rewards in Figure 1.

So what is the lesson? This example shows how peoples' choices can be influenced by more than individual rewards. In the decision problems in Figures 1 and 2, the employer has the opportunity to be nice to the employee though being nice is irrational because it reduces the employer's monetary reward. If the employer chooses not to be nice, the employee has the opportunity to be mean to the employer though being mean is irrational because it reduces the employee's monetary reward. However, if the cost of being irrational is not too high, the employee may indeed be irrationally mean, which makes it sensible for the employer to be irrationally nice. This type of behavior has been referred to as the rationality of being irrational.

There are more examples we could have talked about that share two common themes. First, people care about more than their own personal rewards when making strategic decisions. Second, people are concerned about

the intentions of others when making strategic decisions. People can respond quite differently and irrationally if they think your choices are intended to be nice rather than mean, cooperative rather than uncooperative, or fair rather than unfair. Therefore, when evaluating strategic decisions, it is important to think carefully about how the intentions of your choice will be perceived by others and how they might respond (possibly irrationally) to these perceived intentions.

## Conclusions

We are all predictably irrational. For example, we tend to make safe bets when we think we have something to win and risky bets when we think we have something to lose even if the gamble is the same. We can be duped by the illusion of a deal. We grab instantaneous rewards even when we know they are not in our ultimate best interests. We are willing to sacrifice our interests to reward the good and punish the bad intentions of others. The problem with being predictably irrational is that it makes us susceptible to choices that are contrary to our aspirations.

Mounting evidence shows that a lot of our irrational behavior is attributable to how our brains receive and process information. While this suggests we may be hardwired to make irrational choices, there is also evidence to show that short circuiting this wiring is often possible.

An important question behavioral economists continually wrestle with is when can we short circuit our irrational behavior on our own and when do we need help. Regardless, before we can act on our own or ask for help, we must recognize when we are prone to irrational behavior. Hopefully, the examples in this talk will help you start to see some of your own irrational choices and encourage you to learn more about avoiding them; particularly, when they are likely to be detrimental to your professional and personal success.

## Suggested readings

Ariely, D. (2008). *Predictably Irrational: The Hidden Forces That Shape Our Decisions*. HarperCollins Publisher. New York, NY.

Kahneman, D. (2011). *Thinking, Fast and Slow*. Farrar, Straus and Giroux. New York, NY.

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



Figure 2:

