



# WHY TAKE A RATIONAL APPROACH TO A PREDICTABLY IRRATIONAL PROBLEM?

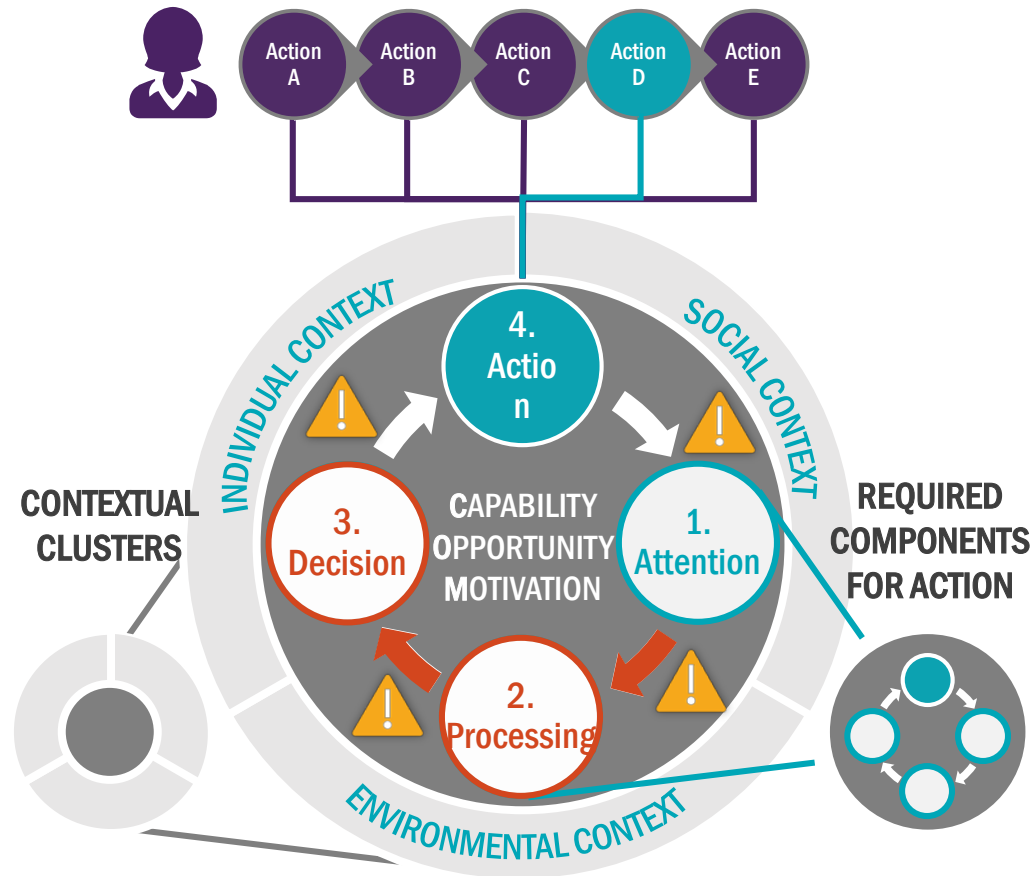
*Understanding the role of mental shortcuts and cognitive biases in the way our brains process risk and probability*

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# AGENDA

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- ❑ How Action Happens
  - ❑ Introduction to Suboptimal Decision-Making
  - ❑ The Mental Math of Probability
  - ❑ There's No Time Like the Present
  - ❑ The Power of Hope and Fear
  - ❑ It's All Relative
  - ❑ So What? How to Use these Insights
-

# THE PATH TO ACTION: LOTS OF OPPORTUNITIES FOR THINGS TO GO WRONG



- ! Attention:**
- Distraction
  - Lack of cognitive availability
  - Lack of personal relevance

- ! Processing:**
- Shortcuts
  - Cognitive Biases
  - Too much/little information or time

- ! Decision:**
- Inertia/status quo
  - Faulty cost/benefit evaluations
  - Lack of sufficient understanding

- ! Action:**
- Time lapses
  - Lack of opportunity or convenience
  - Lack of sufficient motivation
  - Lack of capability

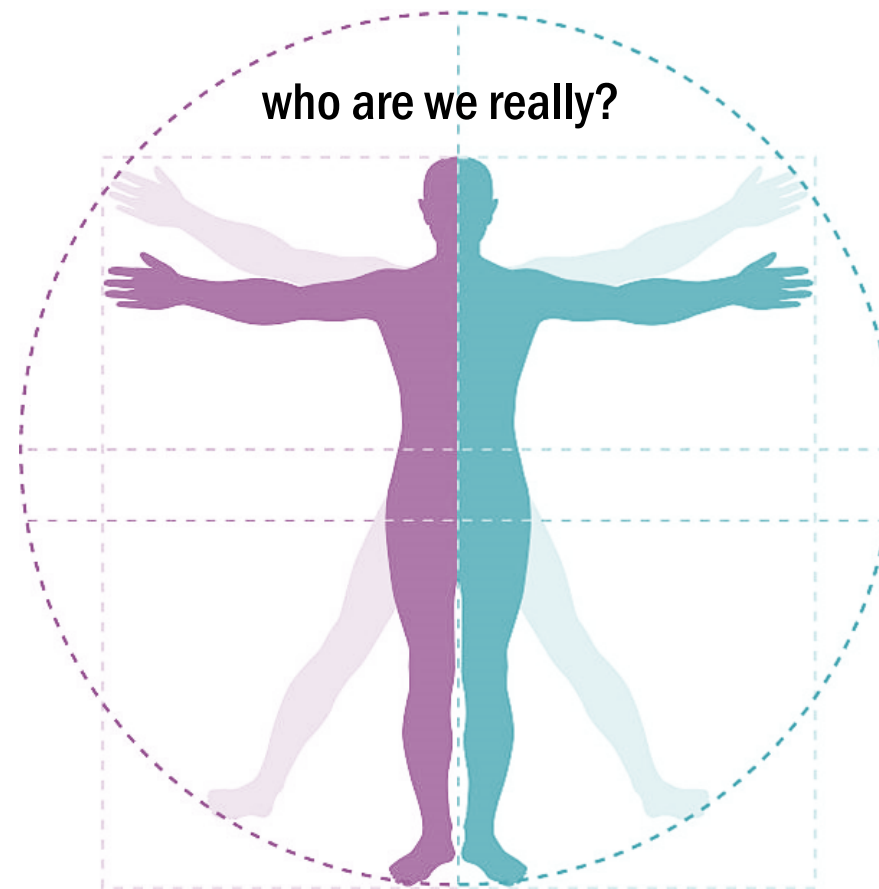
Barrier and behavior sources exist in the context of the individual, their integration/interaction with society, and the environment around them

# MYTH OR FACT? WE ARE RATIONAL AGENTS WHO PREDICTABLY SEEK OPTIMAL, UTILITY-MAXIMIZING OUTCOMES FOR OURSELVES

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## HOMO ECONOMICUS?

- ✓ Know what we want
- ✓ Know our own priorities
- ✓ Can accurately judge the utility or benefit of something at any point in time
- ✓ Can place an accurate value on the utility or benefit of something at any point in time
- ✓ Act selfishly, consciously in pursuit of our own needs first



## HOMO EMOTIONALIS?

- ✓ Take shortcuts & make errors
- ✓ Hindered by even small frictions
- ✓ Often change our hearts/ minds
- ✓ Can be persuaded to make choices that are not in our self-interest
- ✓ Allow emotions to influence our decisions
- ✓ Over-account for past experiences when deciding about the future
- ✓ Follow others, sometimes blindly

# EVIDENCE SHOWS THAT WE ARE PREDICTABLY IRRATIONAL! WE USE SHORTCUTS AND SUBJECTIVE JUDGEMENTS TO MAKE DECISIONS

to expend less mental effort, our brain relies on...



## SHORTCUTS

### Heuristics

Cognitive shortcuts or rules of thumb that simplify decisions and can often lead to cognitive biases.

- ✓ Availability
- ✓ Anchoring
- ✓ Recognition
- ✓ Representativeness
- ✓ Decision Staging
- ✓ Elimination by Aspects
- ✓ Satisficing
- ✓ Take the Best



## SUBCONSCIOUS PREFERENCES

### Biases & Aversions

Systematic (non-random) errors in thinking, where judgment deviates from what would be considered “normal”, “desirable” or “logical.”

- ✓ Action Bias
- ✓ Default Bias
- ✓ Status Quo Bias
- ✓ Confirmation Bias
- ✓ Diversification Bias
- ✓ Ownership Bias
- ✓ DIY Bias
- ✓ Hindsight Bias
- ✓ Optimism Bias
- ✓ Present Bias
- ✓ Projection Bias
- ✓ Scarcity Bias
- ✓ Loss Aversion
- ✓ Regret Aversion
- ✓ Inequity Aversion
- ✓ Ambiguity Aversion
- ✓ Information Avoidance

when we try to make good judgments, we irrationally...

### Contextual Effects

Overreliance on environmental, peer, or emotional cues to add additional context or meaning to a decision.

- ✓ Herd Behavior Effect
- ✓ Bubble Effect
- ✓ Framing Effect
- ✓ Decoy Effect
- ✓ Gambler’s Fallacy
- ✓ Hot/Cold Empathy gap Effect
- ✓ Zero Price Effect
- ✓ Pain of Paying Effect
- ✓ Mental Accounting

## FILL GAPS



### Complexity Effects

Overreliance on generalizations, our “gut”, inertia, and history to deal with too much information or complex calculations.

- ✓ Halo Effect
- ✓ Choice Overload
- ✓ Decision Fatigue
- ✓ Naïve Allocation
- ✓ Satisficing
- ✓ Habit Loops
- ✓ Sunk Cost Fallacy
- ✓ Myopic Loss Aversion
- ✓ Myopic Procrastination
- ✓ Disposition Effect
- ✓ Control Premium
- ✓ Time Discounting
- ✓ Certainty/ Possibility Effect
- ✓ Less is Better Effect
- ✓ Ratio Bias
- ✓ Overconfidence Effect

## SIMPLIFY





**PROBABILITY X IMPACT**

# PROSPECT THEORY

HOW WE DECIDE BETWEEN ALTERNATIVES THAT INVOLVE RISK AND UNCERTAINTY

**SPOILER ALERT: WE DO A [predictably] NOT-SO-GREAT JOB**



# WARNING!

## YOUR CHANCES JUST INCREASED

From **20%** to **40%**

From **0%** to **5%**

From **95%** to **100%**

By the numbers (just the facts)

The chances just  
**DOUBLED**

**Absolutely no chance**  
just went to **basically no**  
**chance**

**Basically certain** just  
went to **absolutely**  
**certain**

Objective (expected and rational) interpretation

**Meh**, chances went up a  
bit

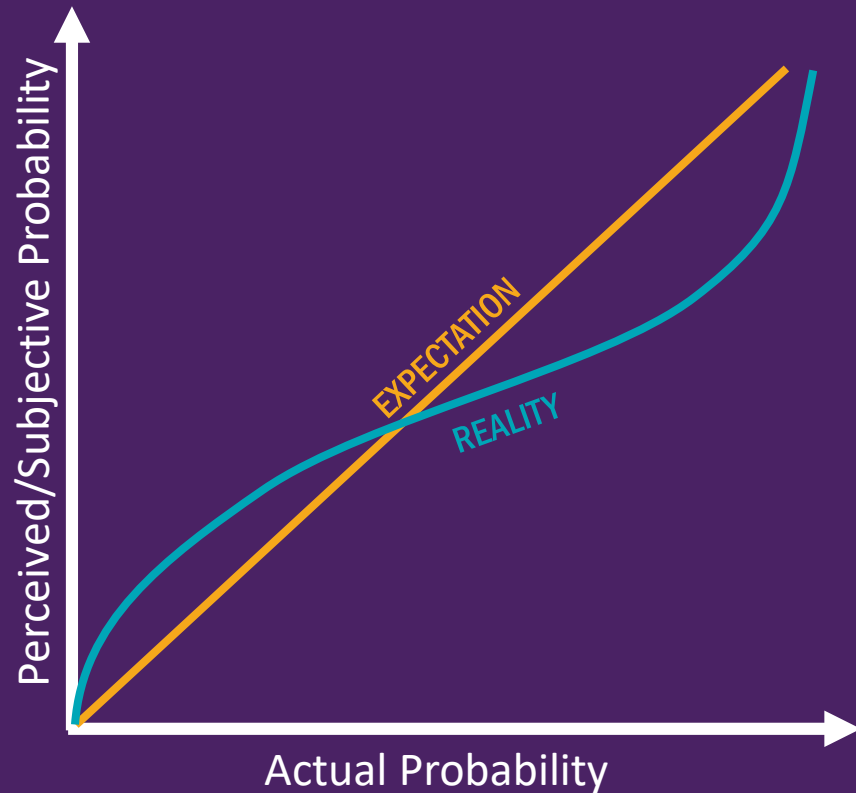
**OMG**, now there's a  
**chance!**

**OMG**, now it's **certain!**

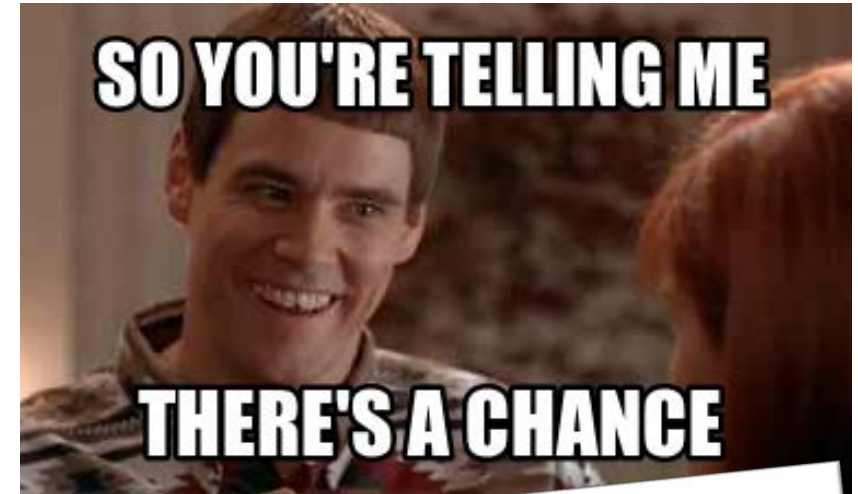
This is your brain on certainty and possibility effects

# THE MENTAL MATH OF PROBABILITY: OUR NON-LINEAR ASSESSMENT OF CHANCE

PEOPLE GENERALLY DO NOT LOOK AT THE VALUE OF PROBABILITY UNIFORMLY BETWEEN 0 AND 100%



- Lower probability has been observed to be over-valued



- Medium to high probability has been observed to be under-weighted





WHAT WOULD YOU BE WILLING TO DO TO AVOID PAYING...

**\$20,000**  
in the next  
**3 MONTHS**

VS.

**\$50,000**  
in the next  
**20 YEARS**

WOULD YOU PREFER...

**\$100**  
**NOW**

OR

**\$120**  
**IN A MONTH**

# TEMPORAL DISCOUNTING: THERE'S LITERALLY NO TIME LIKE THE PRESENT

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## GAINS

- We value present rewards/benefits more than future ones
- Once rewards/benefits are very distant in time, they cease to be valuable
- In hyperbolic discounting, values placed on rewards decrease very rapidly for small delay periods (i.e., the difference between today and a year from now) and then fall more slowly for longer delays (i.e., the difference between 12 months and 14 months from now).

## LOSSES

- We discount future losses at a much faster rate than gains – that is, delayed/future losses appear much less intimidating than immediate losses because delayed losses are heavily discounted
- In a loss scenarios, we are more likely to take our chances that something might change for us between now and the delayed outcome

**DO YOU BELIEVE YOU WILL GET DIVORCED?**

The facts show that half of us will. But not you, right?

**HOW DO YOU FEEL ABOUT A \$50/MONTH PAY RAISE?**

Big whoop.

**WHAT ABOUT A \$50/MONTH PAY CUT?**

How DARE you.

# OPTIMISM AND LOSS AVERSION: THE POWER OF HOPE AND FEAR

## LOSSES LOOM LARGER THAN GAINS

- Commonly believed that the pain of losing is about twice as psychologically powerful as the pleasure of gaining
- People are more willing to take risks (or behave dishonestly) to avoid a loss than to make a gain

## “AND SOMETIMES AGAINST ALL ODDS, AGAINST ALL LOGIC, WE STILL HOPE”

- We tend to overestimate the probability of positive events and underestimate the probability of negative events happening to us in the future
- A number of factors can explain unrealistic optimism, including perceived control and just being in a good mood

## FOURFOLD PATTERN OF RISK ATTITUDES

	GAINS FRAMING	LOSSES FRAMING
HIGH PROBABILITY (Certainty Effect)	95% chance to win \$10K Fear of disappointment <b>RISK-AVERSE</b> (will not participate)	95% chance to lose \$10K Hope to avoid loss <b>RISK-SEEKING</b> (will participate)
LOW PROBABILITY (Possibility Effect)	5% chance to win \$10K Hope of large gain <b>RISK-SEEKING</b> (will participate)	5% chance to lose \$10K Fear of large loss <b>RISK-AVERSE</b> (will not participate)

# IS A 9 POUND BABY LARGE?

**Mom A's** kids all averaged **9 lbs**

**Mom B's** kids all averaged **5 lbs**

# IS \$2,000 A YEAR FOR AN INSURANCE POLICY (PAID AT ONE TIME) A LOT?

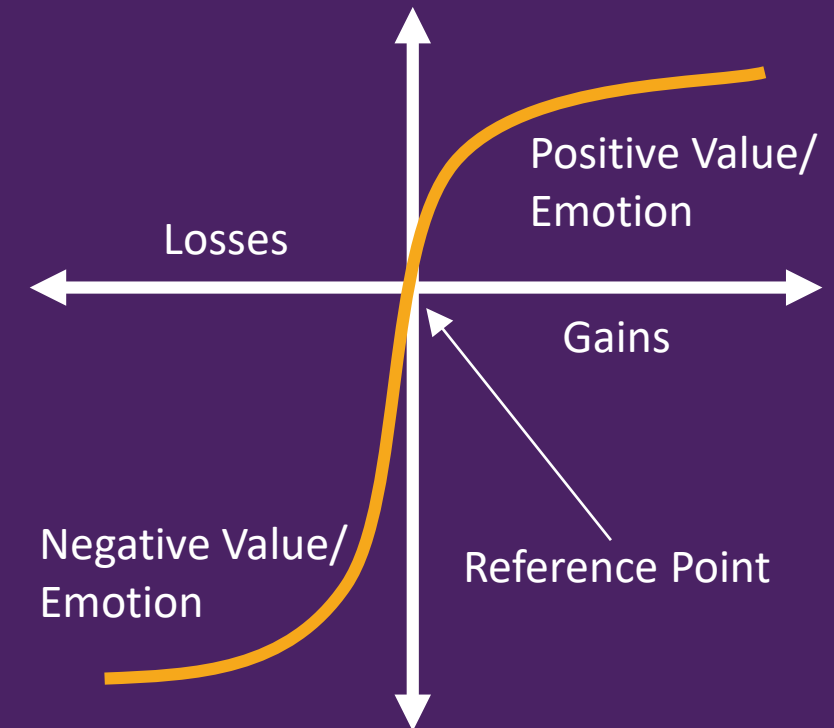
**Family A** spends **\$2,000/month**  
on entertainment, dinner out,  
and daily Starbucks

**Family B** must strictly adhere to  
a budget of no more than  
**\$20/month** for non-essentials  
like entertainment

# REFERENCE DEPENDENCE: OUR EVALUATION OF BENEFITS AND COSTS IS RELATIVE AND SUBJECTIVE

- People evaluate outcomes relative to a personal reference point (rather than an absolute/objective zero point) and then classify gains and losses
- Typically, reference points are constructed from our current situation or experience or a past experience
- Reference points are also often constructed of our most recent and memorable experiences

WE ALL BEGIN OUR EVALUATION OF POSITIVE/NEGATIVE OR BIG/SMALL SOMEWHERE... USUALLY NOT ZERO AND PROBABLY AT A DIFFERENT PLACE THAN OUR NEIGHBOR





# AS POLICY IMPLEMENTERS, COMMUNICATORS, & CHANGE MANAGERS, WHY DO WE CARE ABOUT BEHAVIORAL INSIGHTS? TO CREATE OR AVOID PREDICTABLE RESULTS!

## POSSIBLE VS. CERTAIN: *when asking a subject to compute probabilities*

DO	DON'T
<ul style="list-style-type: none"><li>✓ Explain – known risks are more palatable than unknown, but keep it simple</li><li>✓ Emphasize risks and mitigation benefits that are “certain, if...” or “possible, if” and compare them to the opposite</li></ul>	<ul style="list-style-type: none"><li>✓ Emphasize medium probabilities. We can't see the urgency.</li><li>✓ Use percentages (use concrete odds instead)</li><li>✓ Over explain – more data does not equal more understanding and action. What's easiest to evaluate is often attended to even before what's most important</li></ul>

## NOW VS. LATER: *when asking a subject to make an intertemporal choice*

DO	DON'T
<ul style="list-style-type: none"><li>✓ Talk in terms of immediate benefits/costs – even if they are seemingly smaller than the long-term benefits/costs</li><li>✓ Prime the field – help people imagine what it would be like to experience the future benefit/cost before making the choice</li></ul>	<ul style="list-style-type: none"><li>✓ Emphasize future benefits or costs just because they are larger. We have already taken a big future “discount” off.</li></ul>


## HOW GOOD VS. HOW BAD: *when asking a subject to evaluate benefits and costs*

DO	DON'T
<ul style="list-style-type: none"><li>✓ Utilize framing – particularly illustrating choices as losses or penalties for inaction</li><li>✓ Help people adjust their reference point through primers/reminders or normative feedback (what are others doing?)</li></ul>	<ul style="list-style-type: none"><li>✓ Serve up choices that will be perceived as more difficult or a loss relative to the status quo</li><li>✓ Open the aperture and allow people to bring in unhelpful or unrelated information – create the whole context for them!</li></ul>

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# THE EFFECTS OF FRAMING AND REFERENCE POINTS ON PREFERENCE REVERSAL IN A TYPICAL HOME BUYING SCENARIO

*You are buying a house in a neighborhood that you love. You are far into the process and the inspectors have found that the HVAC system is very old and on the edge of being too small for the house now that the sellers finished the basement last year. There is a chance that the system could fail very soon and cost many thousands of dollars to replace.*

**4**  **GAINS FRAME**

First time homebuyers. No experience with major home repairs. Hopeful, but not expecting, that the seller will help them address the HVAC.

**3**  **LOSSES FRAME**

Experienced homebuyers. Want to deal with HVAC issue themselves. Expecting the seller to offer a \$10K cash concession which they've already earmarked for other things.

**Scenario A**  
(Low Probability)

**Option A1** **10% Chance** \$10,000 HVAC Replacement  
**90% Chance** \$0 – HVAC is left as-is



**Option A2** **100% Chance** \$1,100 HVAC Warranty



**Scenario B**  
(High Probability)

**Option B1** **90% Chance** \$10,000 HVAC Replacement  
**10% Chance** \$0 – HVAC is left as-is



**Option B2** **100% Chance** \$7,000 HVAC Replacement

