Driving Healthy Habits through Behavioral Product Design

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“Never trust an overweight habit designer”
– Nir Eyal (nirandfar.com)

A Little Bit About Me

T-shaped" approach to my career:

- Went **deep** for first 15 years (Life Science research)
- Went **broad** for past 10 years (Sales, Business Development, Marketing, Product Design)

- B.Sc. **Physics** & **Biology** (Maurice Wilkins, Nobel Laureate)
- M.Sc. **X-Ray Crystallography** (Sir Tom Blundell)
- Ph.D. **Biophysics** (X-ray diffraction & electron microscopy; image processing & 3D reconstruction) Donald Caspar & Aaron Klug (Nobel Laureate)

Going Broad

Deep

- Founding Team Oxford Molecular (LSE:OXMOL) 1993
- Founding Team Tripos (NASDAQ: TRPS) 1996
- Founding Team Pangea Systems/DoubleTwist 1999
- Lecturer U.C. Berkeley Ext. 1990-2000
- Co-Founder & CEO, GeneEd: eLearning Life Sciences 2000; acquired 2007

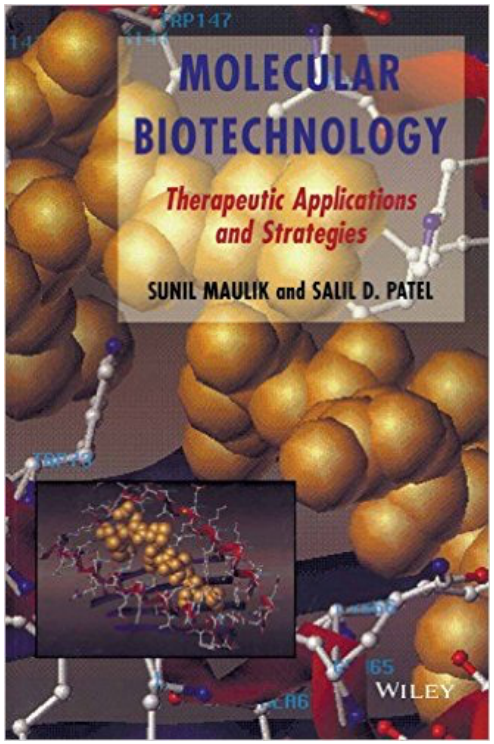
Broad

- Co-Founder 500Friends, acquired 2013; PeoplePower; Mylo Solutions
- Director, Innovation Center Denmark, Silicon Valley
- VP, Designit (Danish Design Agency); acquired by Wipro 2014
- Advisor: Pitching-X, Stanford d-school; Berkeley-Haas; THNQ

Common Theme

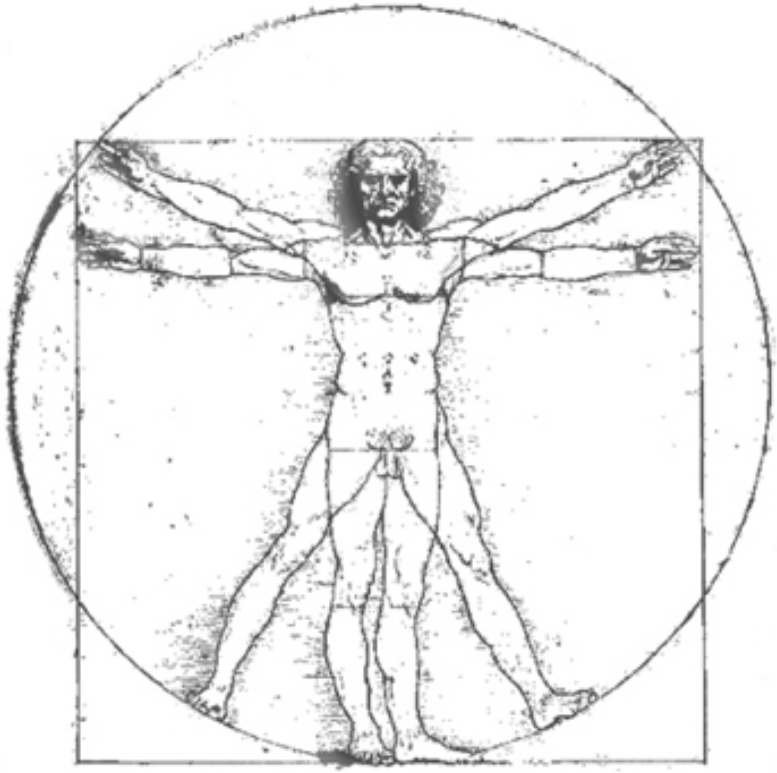
- Mining Information for *Actionable Knowledge*
- *Iterating & Refining* Hypotheses ("Models") Based on Data
- Changing Behaviors Based on *Improved Models*

Leading to an interest in **design for long-term behavior change**



Do You?

- Exercise 3-5x per week?
- Brush and floss daily?
- Drink 4-8 cups of water daily?
- Get 7-8 hrs of sleep?
- Eat fruit at least once per day?
- Meditate at least 3x weekly?
- Work at a standing desk? (Or move around at least once per hour)?
- Go for walks 3x or more per week?
- Use some type of habit-forming tool or tracker?

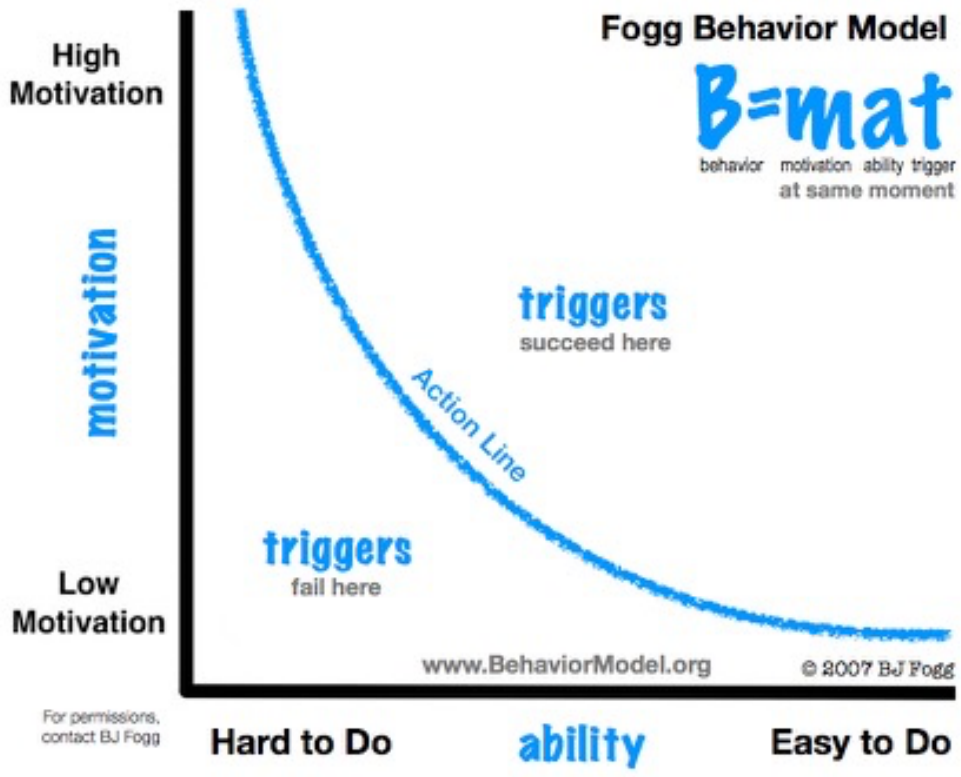


Some Mistakes About Behavior Change

- Relying on **willpower**
- Attempting **big leaps** instead of baby steps
- Ignoring how the **environment** shapes behaviors
- Trying to **stop old behaviors** instead of creating new ones
- Blaming failure on lack of **motivation**
- **Underestimating** the power of triggers
- Believing that **knowledge of the facts** will automatically lead to action
- Focusing on **abstract goals**, not concrete behaviors

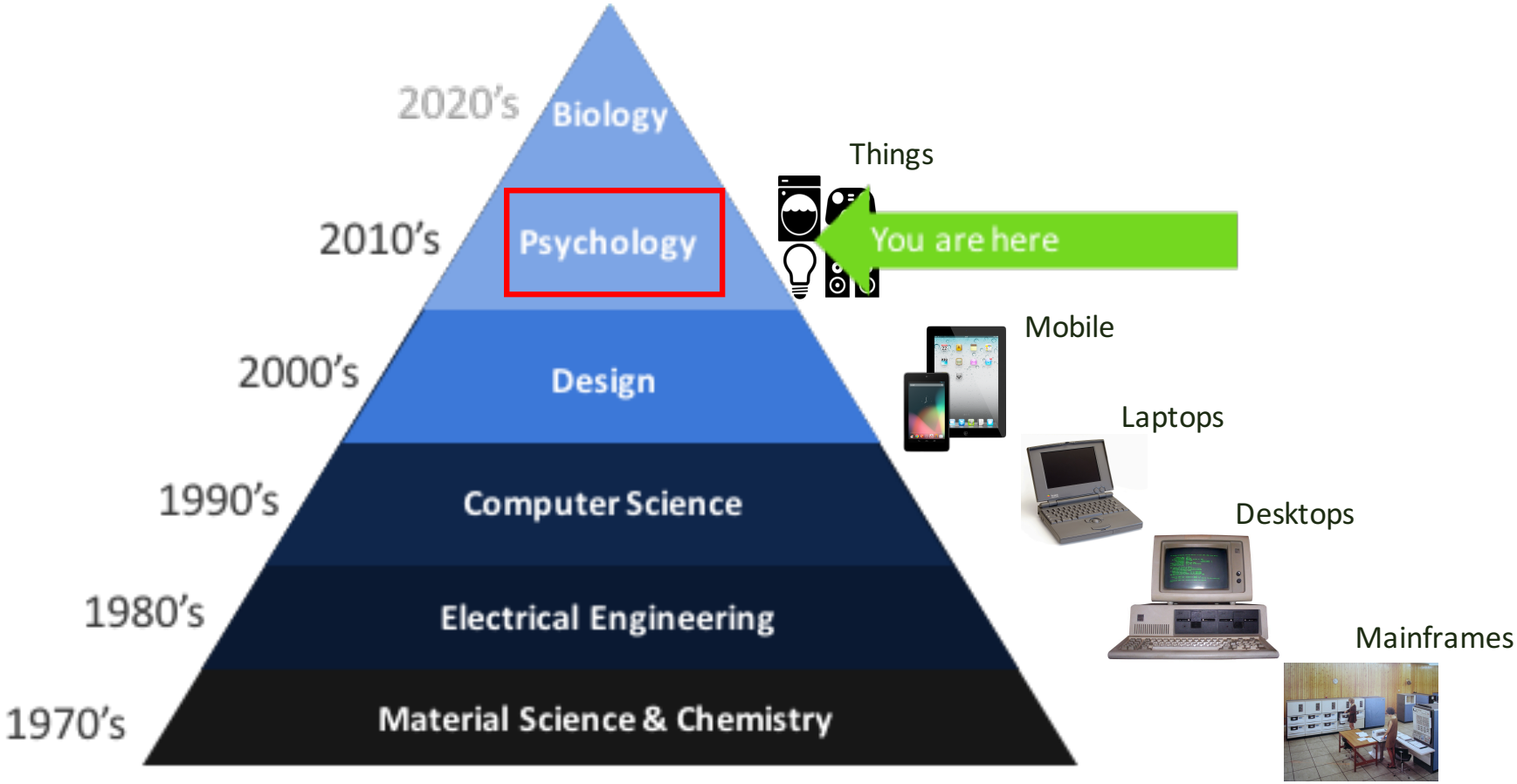
"Look, I can't promise I'll change, but I can promise I'll pretend to change."

BJ Fogg Model of Behavior Change



Stanford Persuasive Technology Laboratory

Each shift in computing unlocks opportunities for innovation in new disciplines



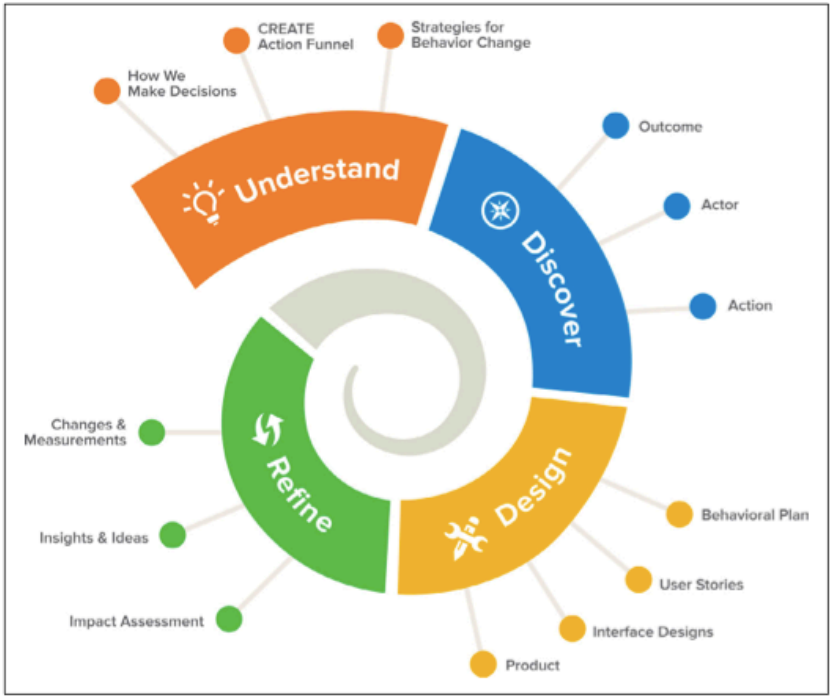
Agenda

- The five stages of behavior design
- Understanding how we make decisions
- Habits and habit-forming behaviors
- Feature design for behavior change
- Structuring products - the CREATE model
- Rewarding the action
- Scale - creating mass behavior change

The Five Stages of Behavior Design

The Five Stages of Behavior Design

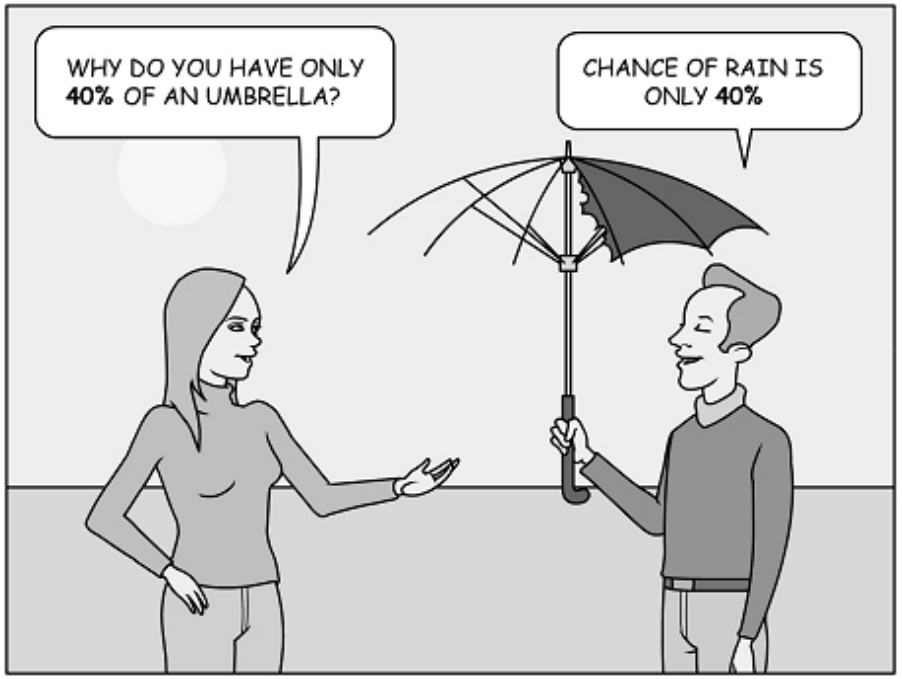
- ***Understand*** – how the user decides to act
- ***Discover*** – the right behavior to change
- ***Design*** – the product, feature or service to bind to that behavior
- ***Refine*** - measure impact and success
- ***Iterate*** – cycle through these steps until the behavior becomes habitual



"*Designing for Behavior Change*" – Steven Wendel, O'Reilly Media

How we Decide to Act

- Most of the time, we're **not consciously deciding** what to do next.
- We often act **based on habits**. They can be created, but are hard to defeat.
- We often make **intuitive, immediate decisions** based on our past experiences.
- When consciously thinking, we **often avoid hard work**. We "wing it" with rough guesses based on similar, but simpler, problems.
- We look to **other people**, especially peers and experts.



"Thinking: Fast & Slow" Daniel H. Kahneman

Decision Making – System1 & System2

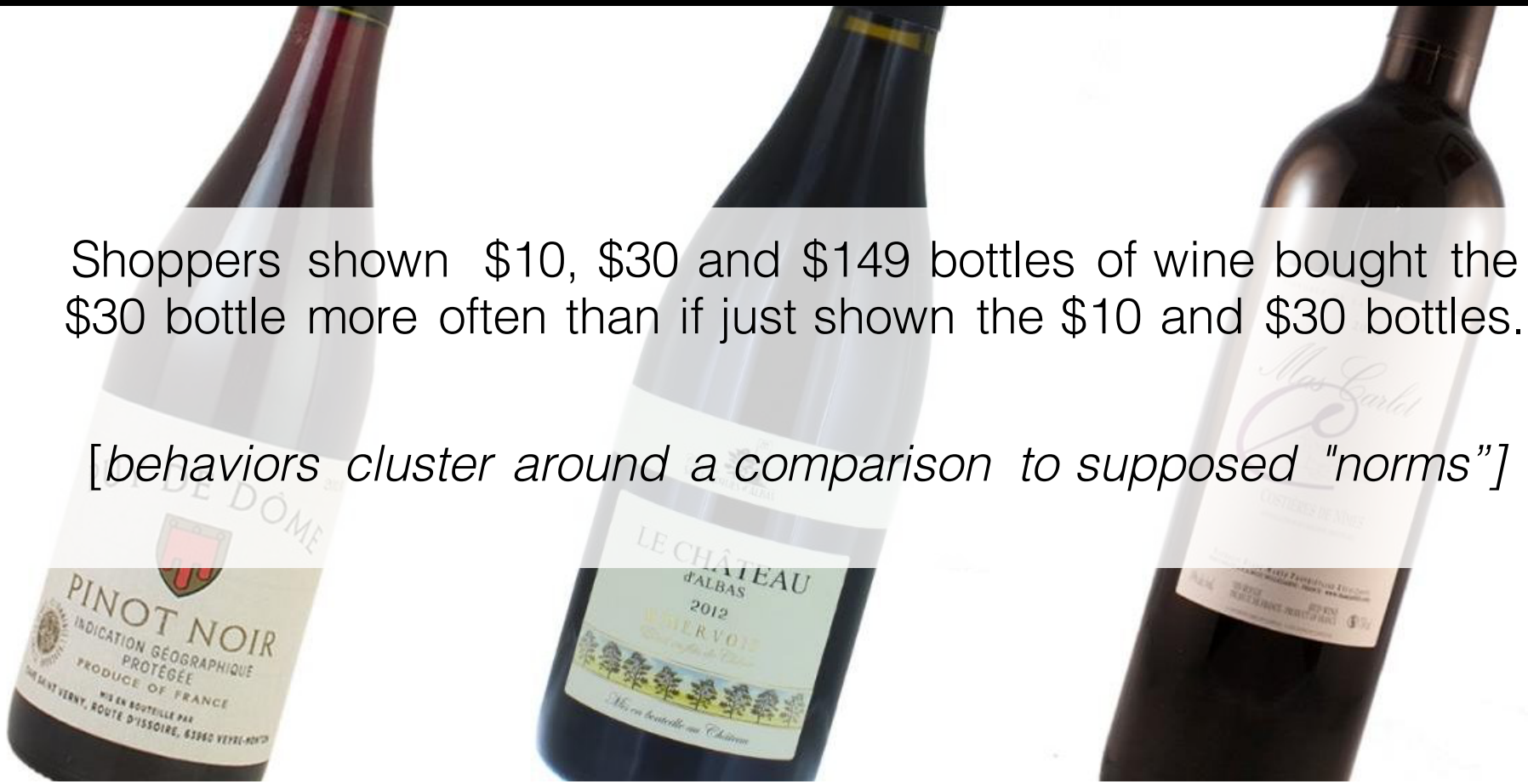
What are the cognitive biases that affect our decision-making?

Priming

Students primed with words about Florida walked slower than students primed with words about New York.

[*a reminder of a feature tees up behaviors reminiscent of that feature*]

Anchoring



Shoppers shown $10, $30 and $149 bottles of wine bought the $30 bottle more often than if just shown the $10 and $30 bottles.

[*behaviors cluster around a comparison to supposed "norms"*]

Framing

With a sign “limit 12 per customer” for soup cans, people take 5 rather than 2

[decisions get framed around a linguistic concept]

Understand

Expectation

Flipping a coin four times and getting 4 heads in a row convinces us that the fifth toss will also lead to heads

[The mind makes models, and fits behaviors to the model]

?

Inertia

Even Economics Professors don't rebalance their 401(k)s effectively!

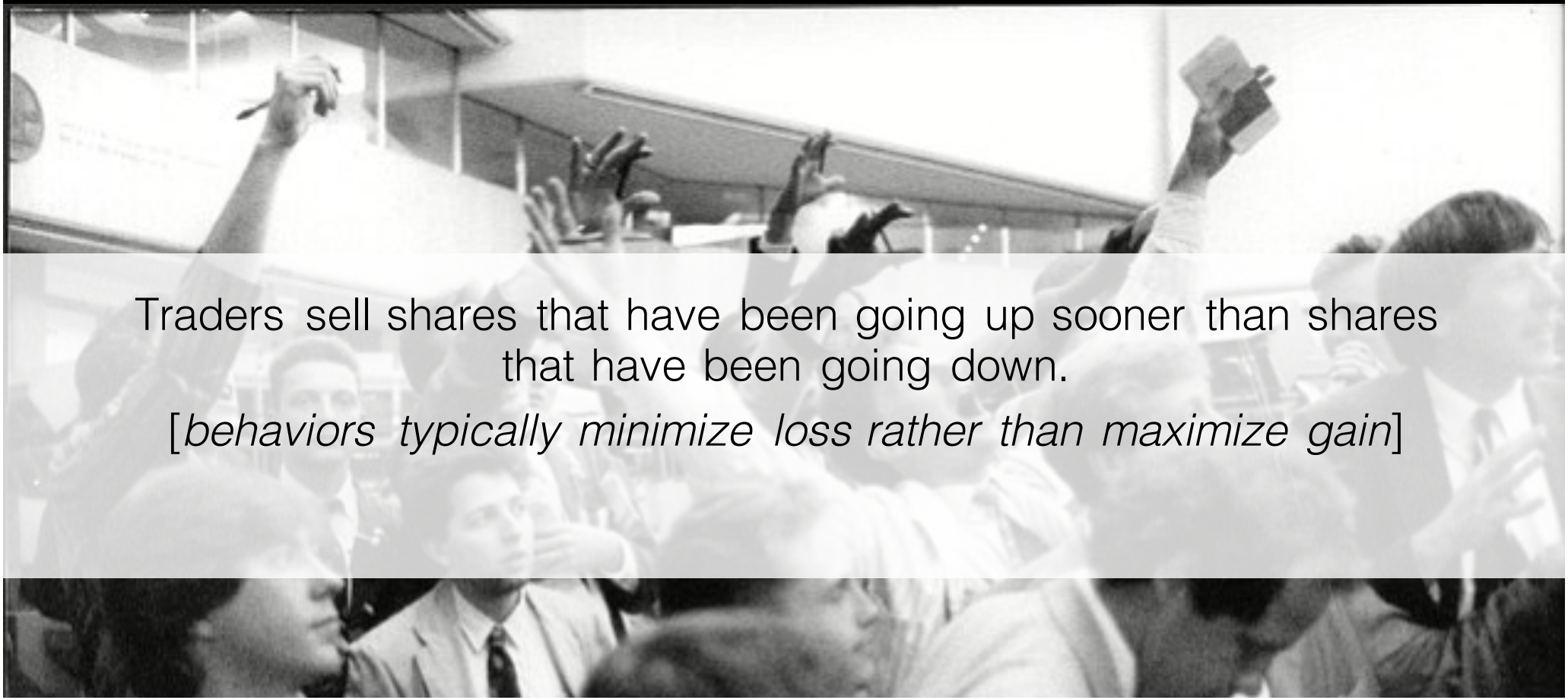
[*the mind does not like expending cognitive energy. Behaviors that uphold the status quo are common*]

Arousal

A smiling picture of a woman sold insurance policies to men as well as a 5% discount

[sexual or other forms or arousal help condition behaviors]

Loss Aversion

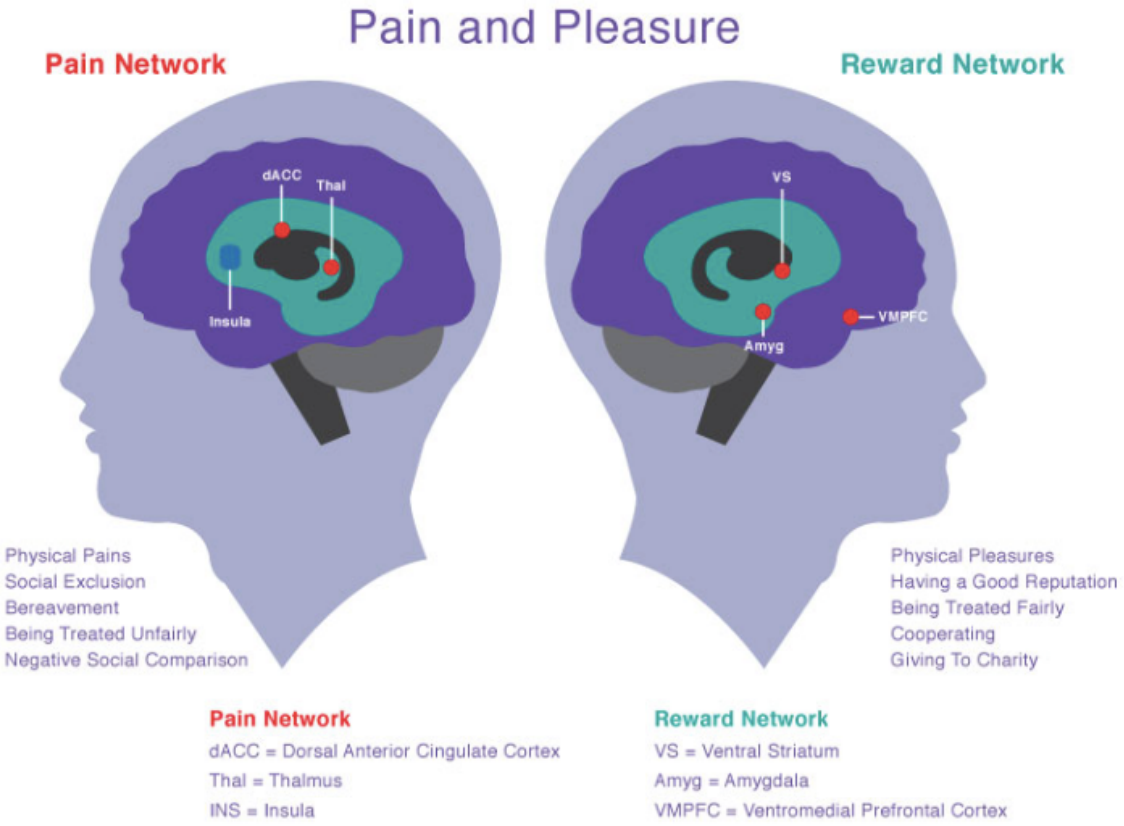


Traders sell shares that have been going up sooner than shares that have been going down.

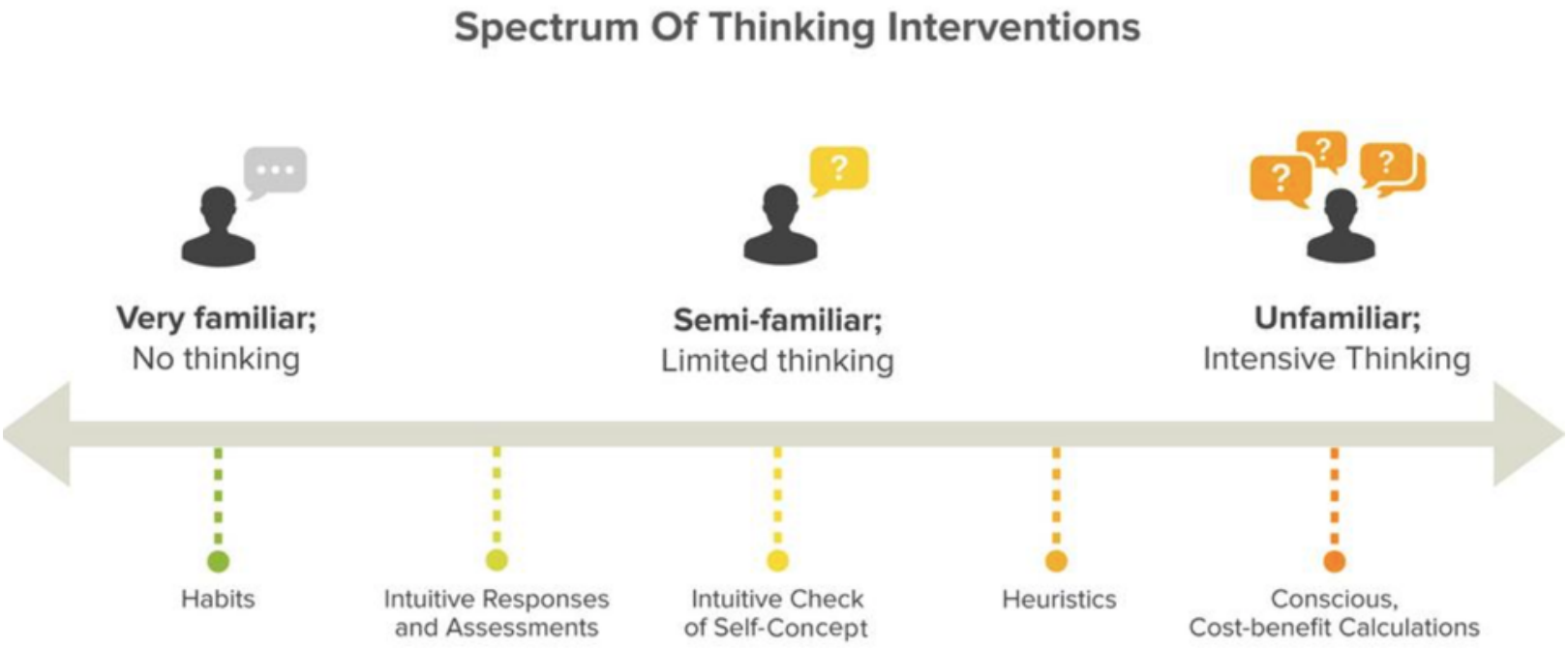
[*behaviors typically minimize loss rather than maximize gain*]

Understanding How We Make Decisions & Form Habits

Why We Act: Pain or Pleasure

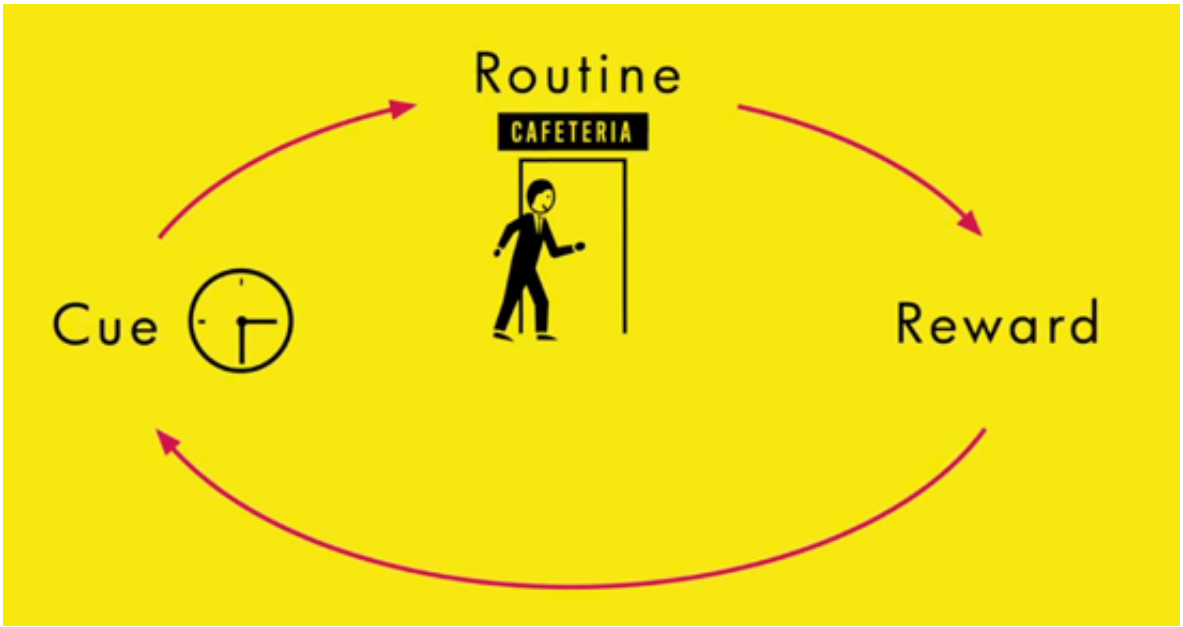


Spectrum of Decision-Making



Understanding Habits (I)

Habits may be defined as “behaviors done with little or no conscious thought”



“*The Power of Habit*” – Charles Duhigg

Understanding Habits (II)

Habits require *frequency*, *automaticity* and a *stable context*.

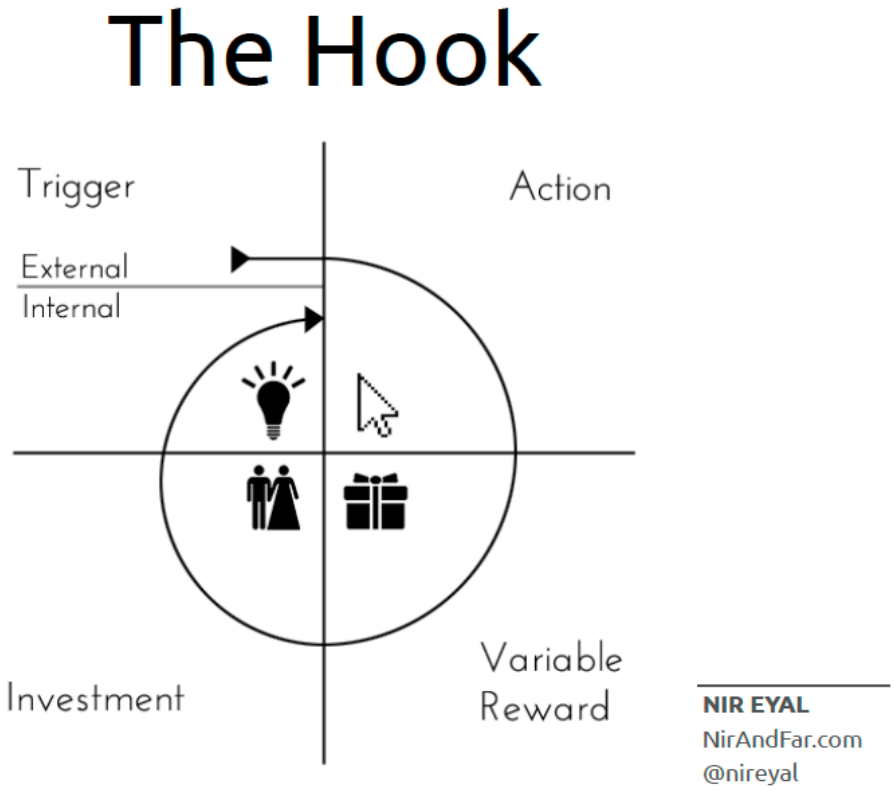
45%

of everyday behaviours are repeated in the same location almost every day

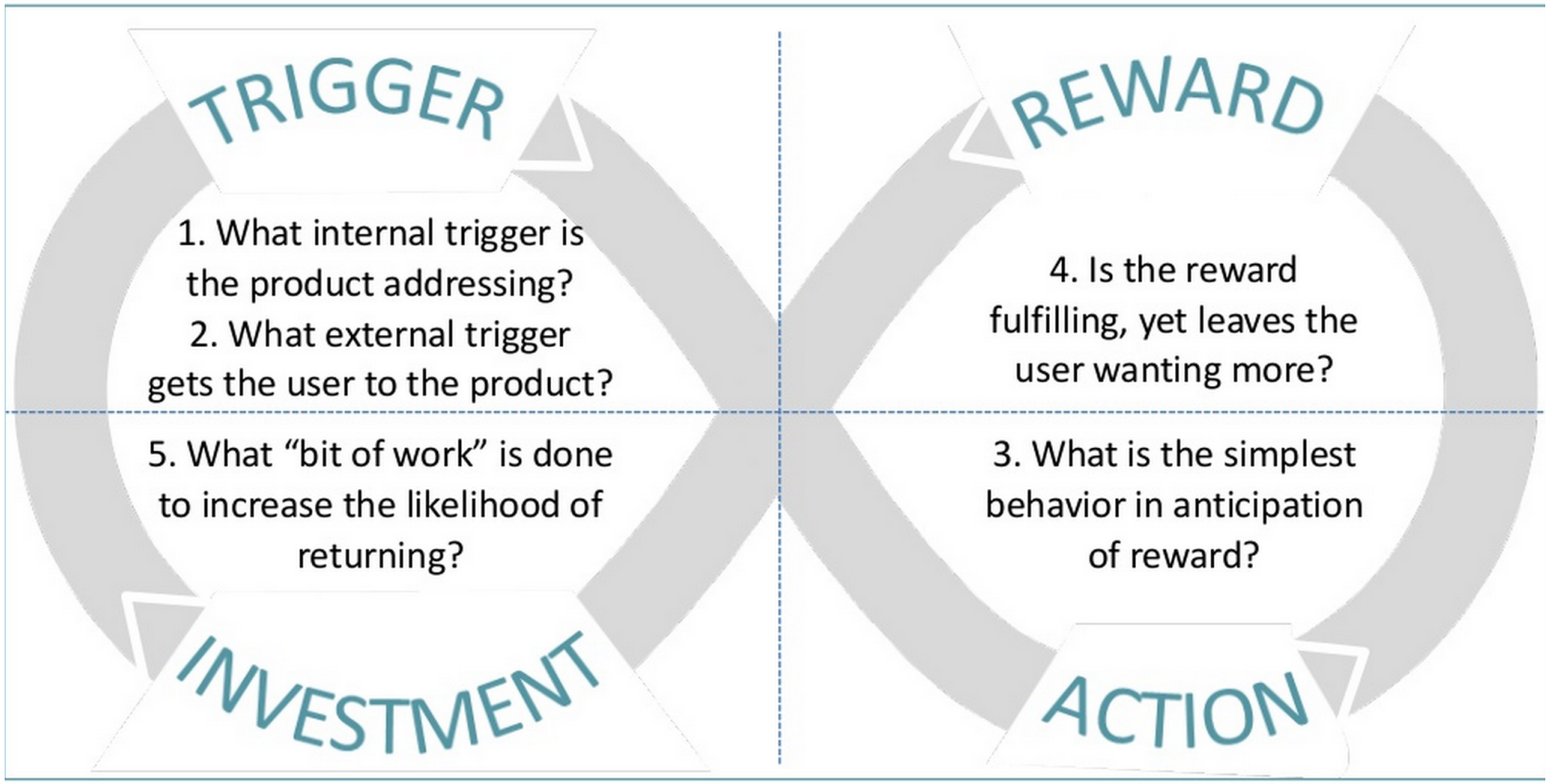
Habits & 'The Hook'

- *Hooks* are experiences designed to *connect the user's problem to a solution* frequently enough to form a habit

- To form a habit, people must do the behavior *frequently*.



Hook Model of Behavior Change



External Triggers

- External triggers are cues *in the user's environment* that suggest what to do next:
  - A **button** telling the user to "click here," "tweet this," or "play now," are all examples of external triggers.
  - A **flashing light** or a **sound** alert are also examples of external triggers.
  - A **progress-bar** or **completion chart** can also act as an external trigger.

Internal Triggers

Internal triggers rely upon associations to prompt actions. The most frequent internal triggers are **emotions**:

- When we're *lonely*, we check Facebook.
- When we're *uncertain*, we Google.
- When we're *bored*, we watch YouTube or scroll Pinterest.

Using Triggers for Behavior Change

- Remove **user work** wherever possible: it's more effective to engineer a solution than to completely alter a behavior.
- **Automate the action** behind the scenes, using intelligent defaults (make the behavior a side-effect.)
- Habits require an unambiguous cue, an unvarying routine, and a meaningful, **immediate** reward.
- Avoid trying to stop an existing behavior, **build new ones** instead.
- Be aware that some type of conscious choice is required for **voluntary** behavior change

"What if we don't change at all ...
and something magical just happens?"

Feature Design for Behavior Change

Feature Design for Behavior Change

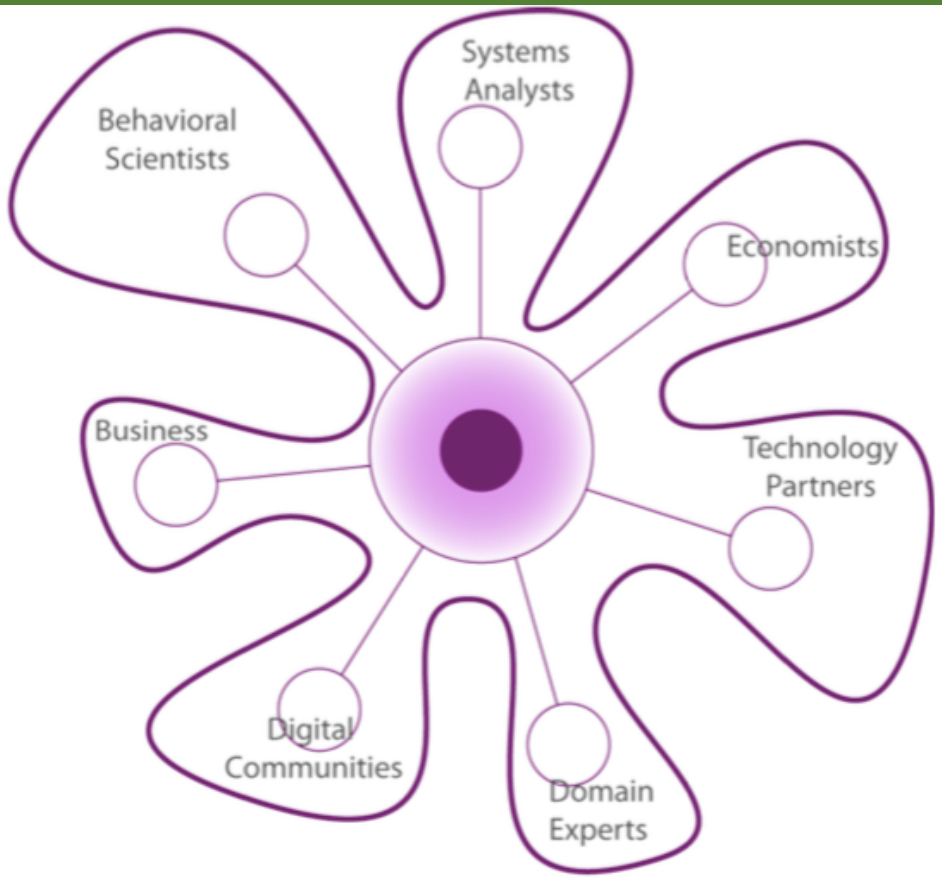
Why Design Thinking?

"Many of the fields in the sciences and humanities are concerned primarily with characterizing ...Of the fields that place value in action, design is one of the few fields that places an emphasis on "*what is the right thing to do*" over "*how to do things right.*"

In addition, it is a field at the crossroads of the human condition, technology, business needs and operational details. As such it is *singularly well suited to generate trans-disciplinary spaces*."

- *Prof. Banny Banerjee, Stanford ChangeLabs and d-school*

Multi-Disciplinary Collaborations



Design Thinking Examples:

Architectural Lens

Techniques used to influence user behavior in architecture, urban planning and related disciplines such as traffic management and crime prevention through environmental design.

Architectural Lens:

Material properties

Can you use the properties of different materials to make some actions more comfortable than others?

Rough-textured paving can act as a subtle barrier between cycle and pedestrian tracks: stray over the line on a bike and you'll feel it

Architectural Lens:

Positioning

Can you rearrange things so people interact with them in the locations you want them to?

Positioning pedestrian crossing push-button units on the right-hand side (UK) makes it more likely that users turn to notice oncoming traffic

Architectural Lens: Angles

Angles

Can you slant or angle things so some actions are easier than others?

Some cigarette bins are sold to authorities using the sloping top as a feature, discouraging people leaving litter on top

Design Thinking Examples:

Error-Proofing Lens

Represents a worldview treating deviations from the target behavior as 'errors' which design can help avoid, either by making it easier for users to work without making errors, or by making errors impossible in the first place.

Error-Proofing Lens:

Interlock

Can you set things up so one action can't be performed until another is completed?

Most modern cash machines don't dispense cash until you remove your card, making it less likely you'll leave it behind

Error-Proofing Lens:

Matched affordances

Can you make parts fit only when the right way round, or only with the products they should do?

The bevelled corner on SIM cards, memory cards and floppy disks ensures that they can't be inserted the wrong way round

Error-Proofing Lens: Task Lock-In/Out

Task lock-in/out

Can you keep a task going that needs to be, or prevent one being started inadvertently?

To prevent accidentally engaging reverse gear, most gearboxes include a 'gate' over/under which the stick must be lifted or pressed

Design Thinking Examples:

Interaction Lens

Brings together some of the common design elements of interfaces where users' interactions with the system affect how their behavior is influenced. Core Interaction patterns such as feedback, progress bars, and previews, and feedforward.

Interaction Lens:

Simulation & feedforward

Can you give users a preview or simulation of the results of different actions or choices?

Interactive savings / loan simulators such as this from Yahoo! are increasingly common, and can influence customer decisions

Interaction Lens:

Summary feedback

Can you give users a report on what they've been doing, or its effects?

GreenPrint, software that reduces wasted prints through better usability, provides users (and their bosses!) with a summary of resources saved

Interaction Lens: Progress Bar

Progress bar

Can you let users know their progress towards achieving a goal?

As demonstrated by examples from LinkedIn and Wikipedia, progress bars showing 'nearly complete' can make a goal seem more achievable

Design Thinking Examples:

Ludic Lens: *[l(y)odic: showing spontaneous and undirected playfulness]*

Influencing user behavior that can be derived from games and other 'playful' interactions.

Ludic Lens:

Storytelling

Can you tell a story via your design, which interests users and keeps them engaged?

Dyson uses narrative booklets drawing customers (and potential customers) into the story behind the company and its technology

Ludic Lens:

Unpredictable reinforcement

What happens if you give rewards or feedback on an unpredictable schedule, so users keep playing or interacting?

Arcade games such as this coin pusher usually employ a strong element of unpredictable reinforcement, to keep users playing/paying

Ludic Lens: Playfulness

Playfulness

Can you design something which 'plays' with its users, provoking curiosity or making interactions into a game?

Spiral wishing wells turn giving money to charity into something actively fun for donors, and provoke curiosity of passers-by

Design Thinking Examples:

Perceptual Lens

Combines ideas from product semantics, semiotics, ecological psychology and Gestalt psychology about how users perceive patterns and meanings as they interact with the systems around them.

Perceptual Lens:

Fake affordances

Is there anything to be gained from making something look like it works one way, while actually doing something else (or nothing at all)?

Many elevator/lift 'door close' buttons are reputedly 'placebo buttons', giving an illusion of control but not speeding up the process

Perceptual Lens: Perceived Affordances

Perceived affordances

Can you design the form of your system to suggest particular actions (or constraints on action) to users?

Reshaping the holes on bins to match the 'form' of different types of waste has been shown to increase recycling levels significantly

Perceptual Lens:

Transparency

Can you (perhaps selectively) reveal what's going on under the surface, to influence users' perceptions and behaviour?

Dyson's transparent dust container both demonstrates the vacuum cleaner's effectiveness, and makes it likely to be emptied more often

Design Thinking: *Cognitive Lens*

Draws on research in behavioral economics and cognitive psychology looking at how people make decisions, and how this is affected by 'heuristics' and 'biases'. (Cialdini; Thaler & Sunstein)

Cognitive Lens:

Desire for order

Can you use people's desire for tidiness to influence them to rearrange elements or take actions you want them to?

The AWARE Puzzle Switch, a light switch design by Loove Broms and Karin Ehrnberger, is visibly 'disordered' when in the 'on' position

Cognitive Lens:

Social proof

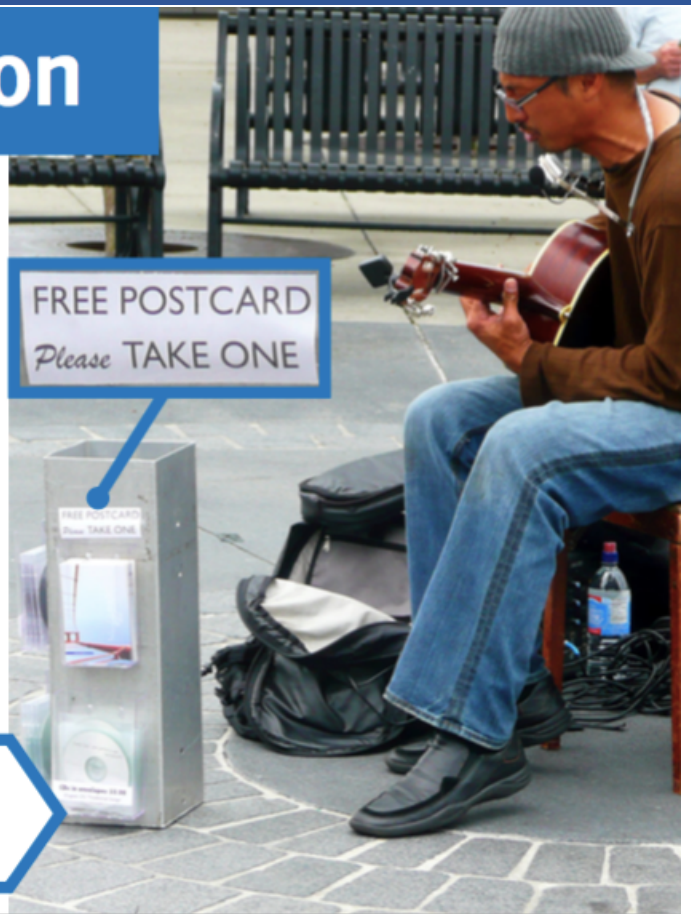
Can you show people what other users like them are doing in this situation, and which choices are most popular?

Amazon's recommendations can be helpful to buyers by expanding the scope of their knowledge, while increasing sales for Amazon

Cognitive Lens: Reciprocation

Reciprocation

Can you make users feel they've been done a favour (by the system, or by other users) and want to return it?



This busker's postcards may be 'free', but the social norms of reciprocation mean most people will give him some tip in return

Design Thinking: *Machiavellian Lens*

Embody an 'end justifies the means' approach of the kind associated with Niccolo` Machiavelli. These will often be considered unethical, but nevertheless are commonly used to control and influence consumers through pricing structures, planned obsolescence, lock-ins, etc. (Vance Packard and Douglas Rushkoff, Benjamin Mako Hill and Chris Nodder)

Machiavellian Lens:

Antifeatures & crippleware

Can you deliberately disable some functions even though they're still present, to drive users to upgrade, or to allow price discrimination?

Sony's cheaper 60-minute MiniDiscs were identical to the 74-minute ones except for a pre-written portion of code preventing full use of the space

Machiavellian Lens:

Degrading performance

Can you degrade the performance of a product or system until users comply with some behaviour change you want?

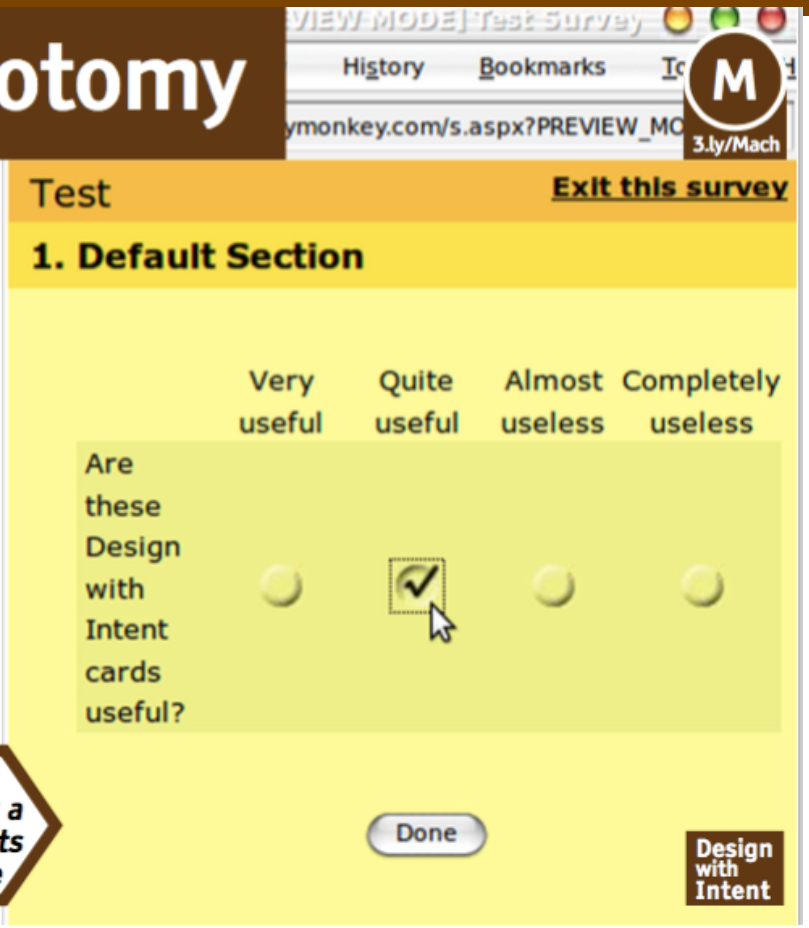
Some Nokia phones allegedly sense when a 3rd-party battery is used and switch into a high-power mode so it runs out more quickly

Machiavellian Lens:

Forced dichotomy

Can you configure a system so there is no 'middle ground' possible, and users must make a choice one way or the other?

An even-numbered (e.g. four-point) rating scale does not allow a 'middle' value: it forces respondents into making a 'good or bad?' choice



Structuring Products – the CREATE Model

Structuring Products: the CREATE model

"Designing for Behavior Change"
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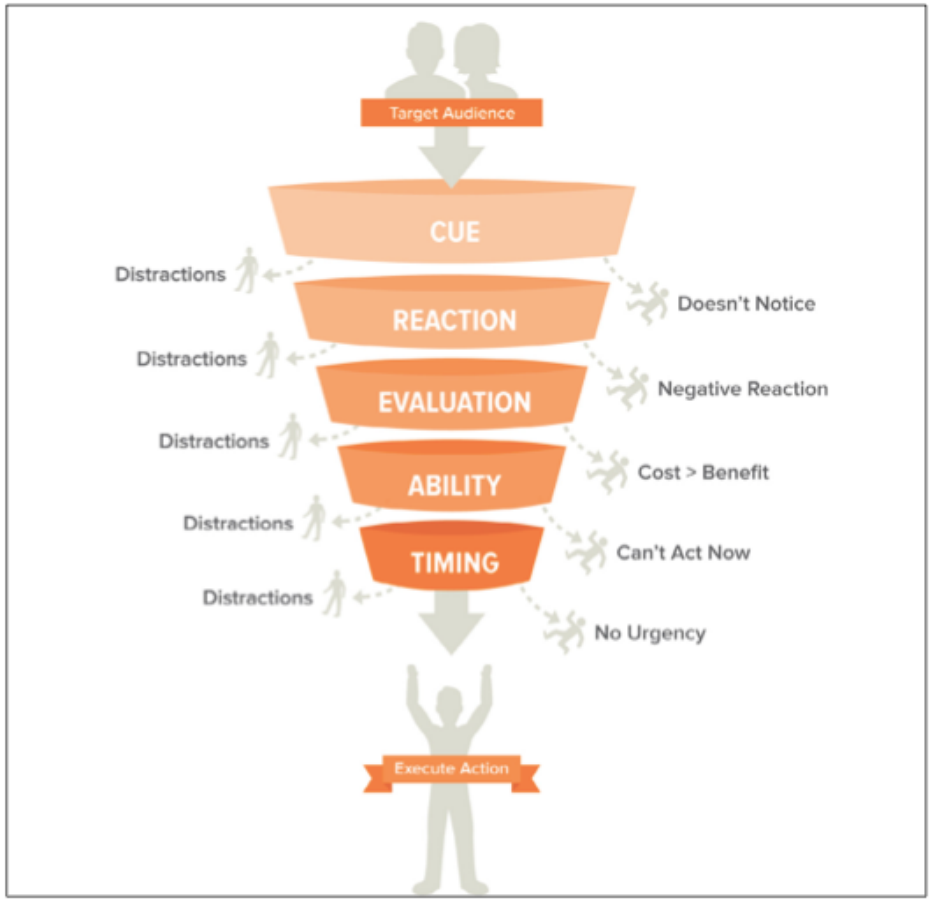
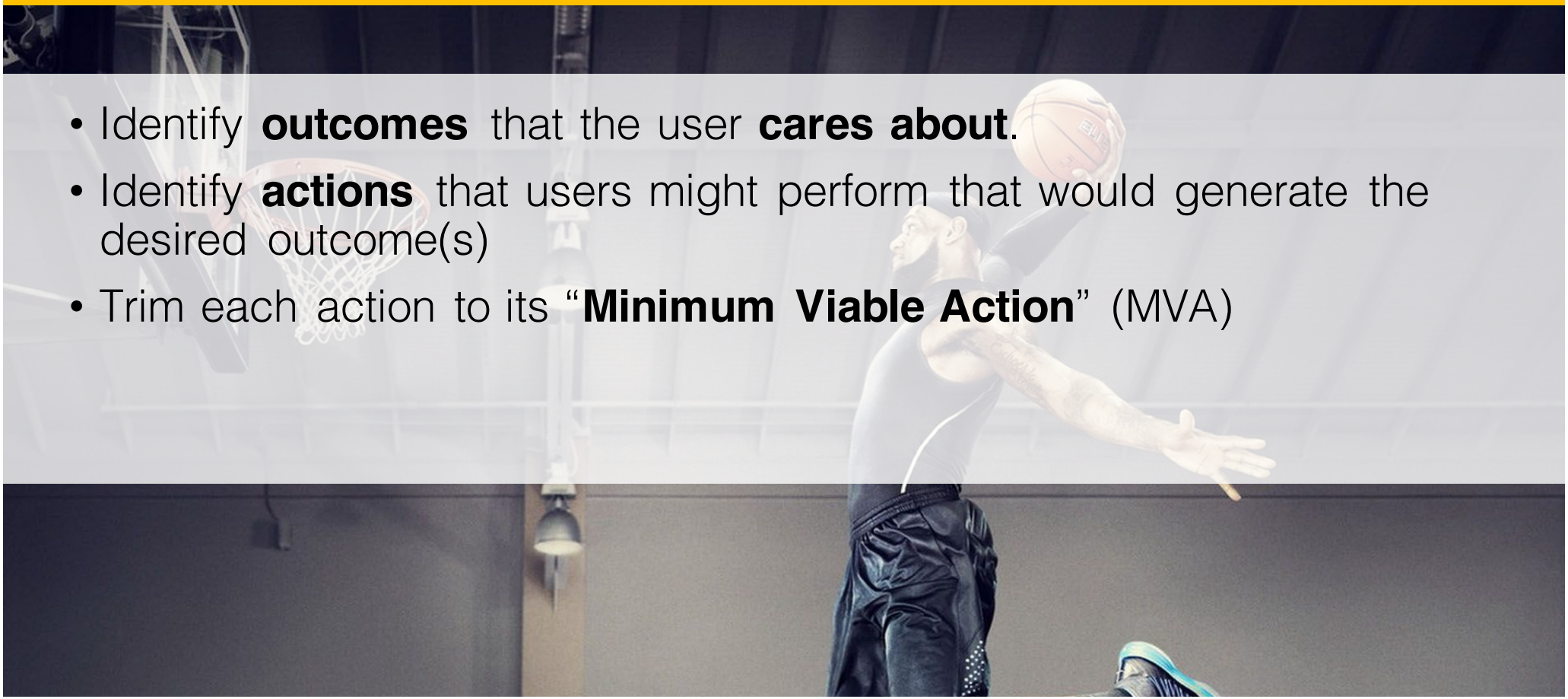
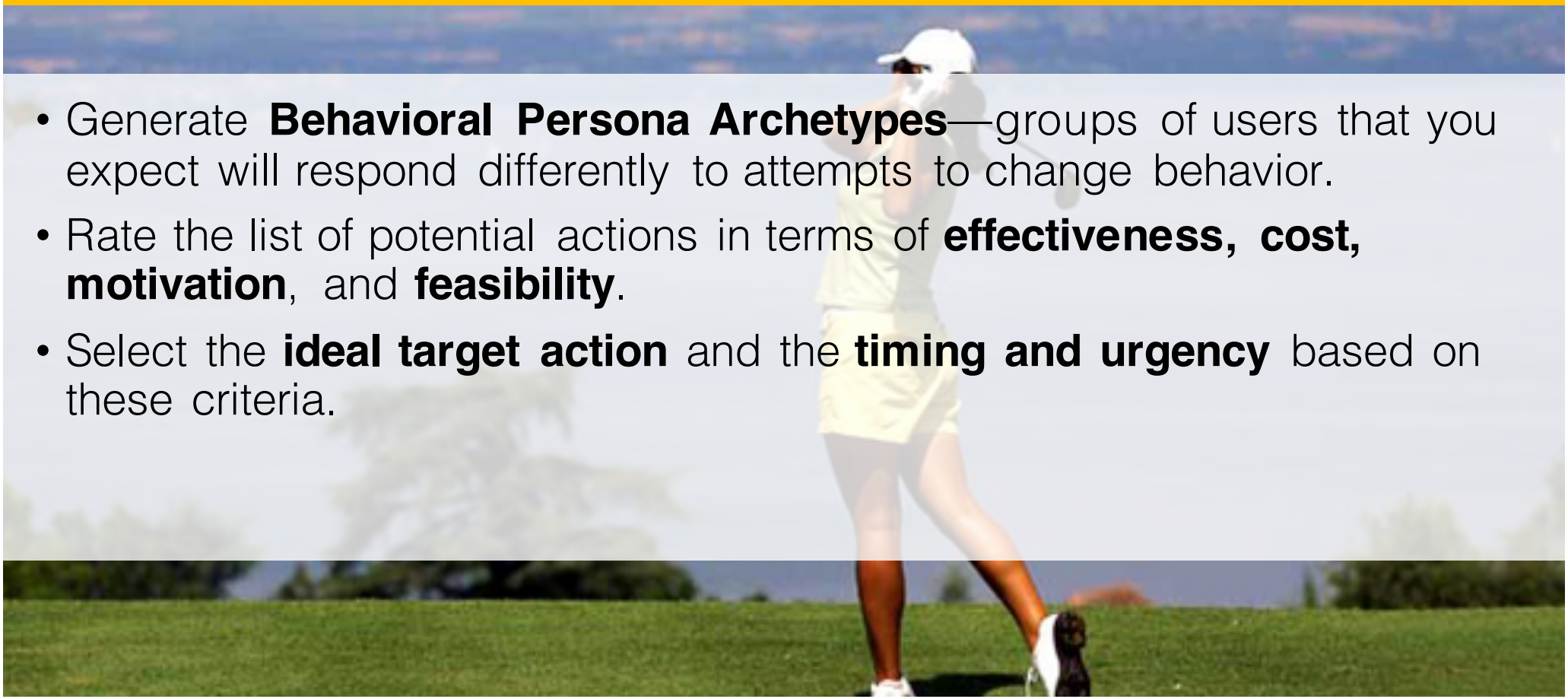


CREATE(I): Determine What to Accomplish



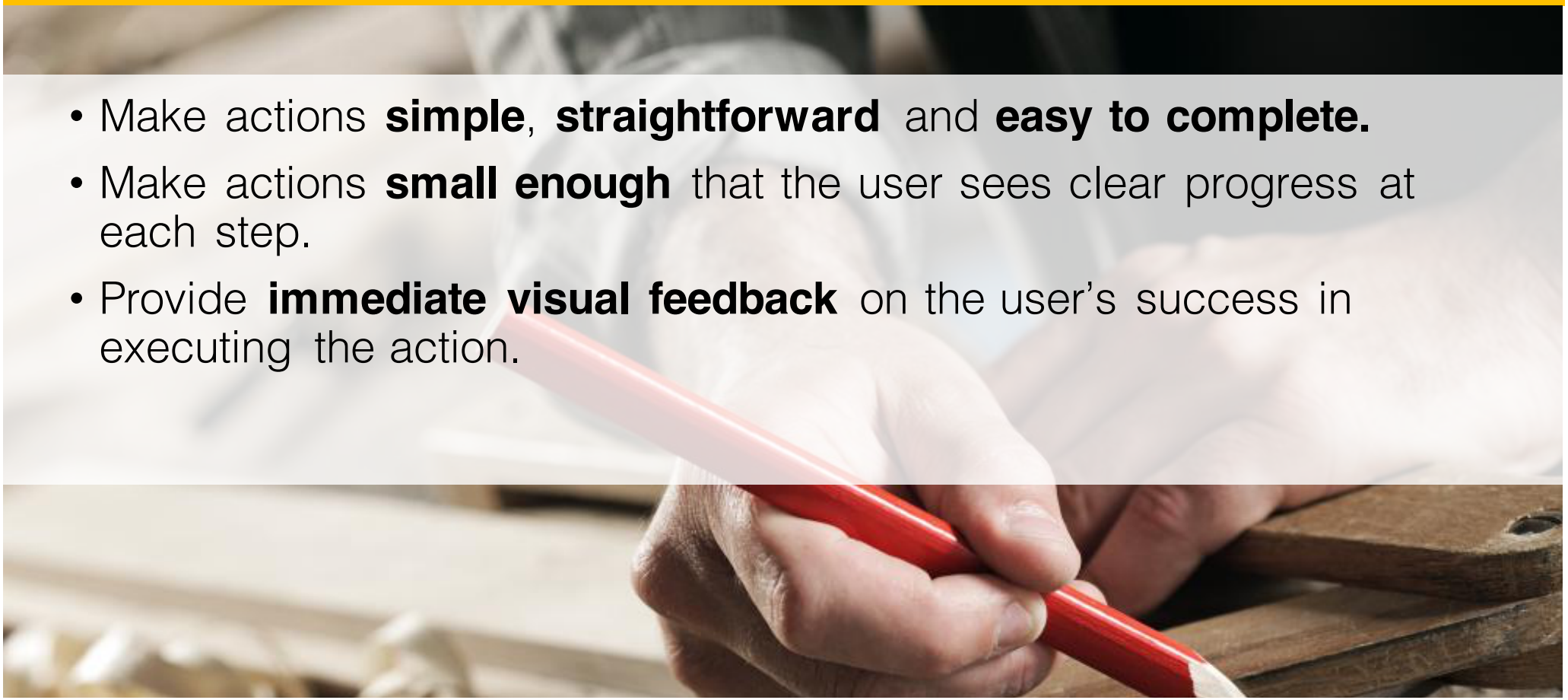
- Identify **outcomes** that the user **cares about**.
- Identify **actions** that users might perform that would generate the desired outcome(s)
- Trim each action to its "**Minimum Viable Action**" (MVA)

CREATE(II): Select the Right Action



- Generate **Behavioral Persona Archetypes**—groups of users that you expect will respond differently to attempts to change behavior.
- Rate the list of potential actions in terms of **effectiveness, cost, motivation**, and **feasibility**.
- Select the **ideal target action** and the **timing and urgency** based on these criteria.

CREATE(III): Structuring the Action



- Make actions **simple**, **straightforward** and **easy to complete.**
- Make actions **small enough** that the user sees clear progress at each step.
- Provide **immediate visual feedback** on the user's success in executing the action.

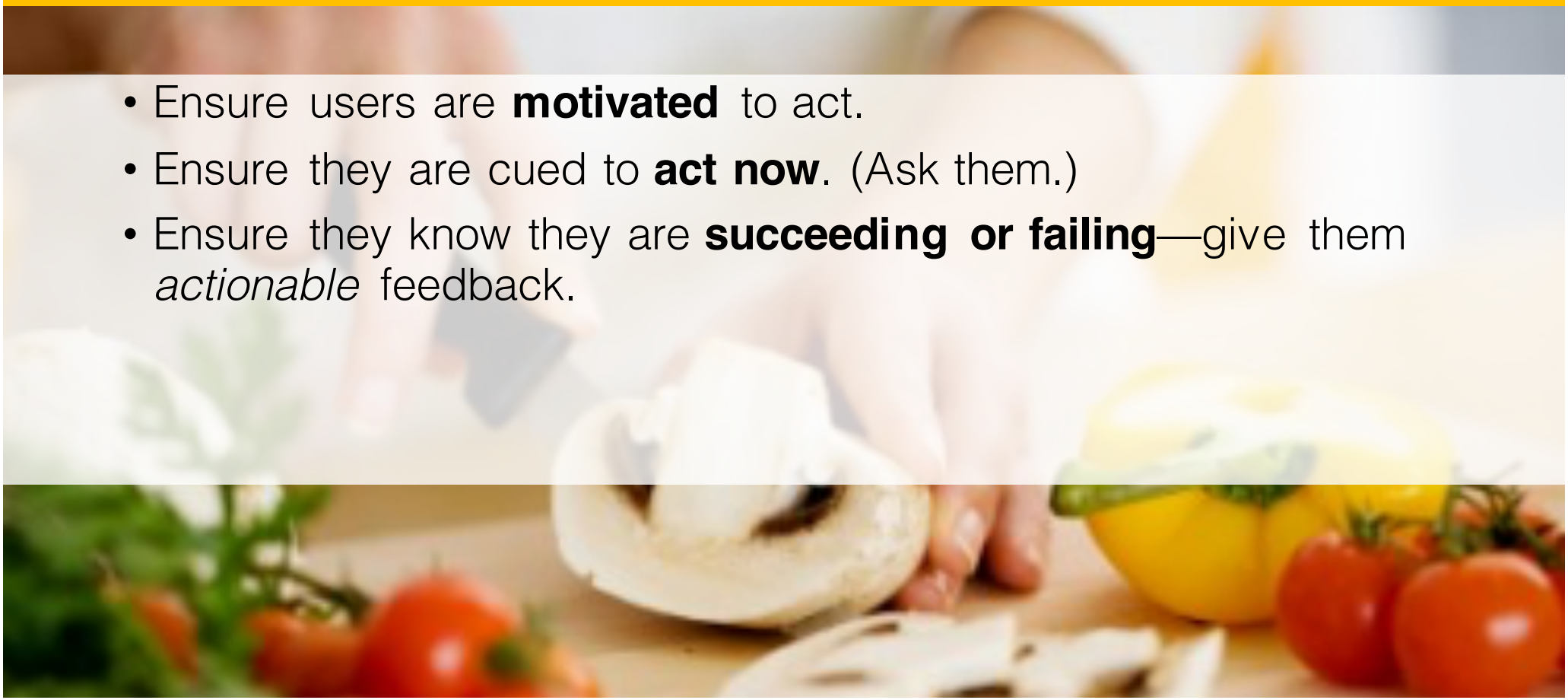
CREATE(IV): Understand User Archetypes

- Users, Customers, & Purchasers may be **different people**
- Make sure you follow the user journey of **all users** of your product or service
- Example: *Salesforce.com*
  - **Customer** is Sales Manager
  - **User** is Sales Rep
  - **Other users** include: Marketing; LeadGen; Telesales

CREATE(V): Construct the Environment

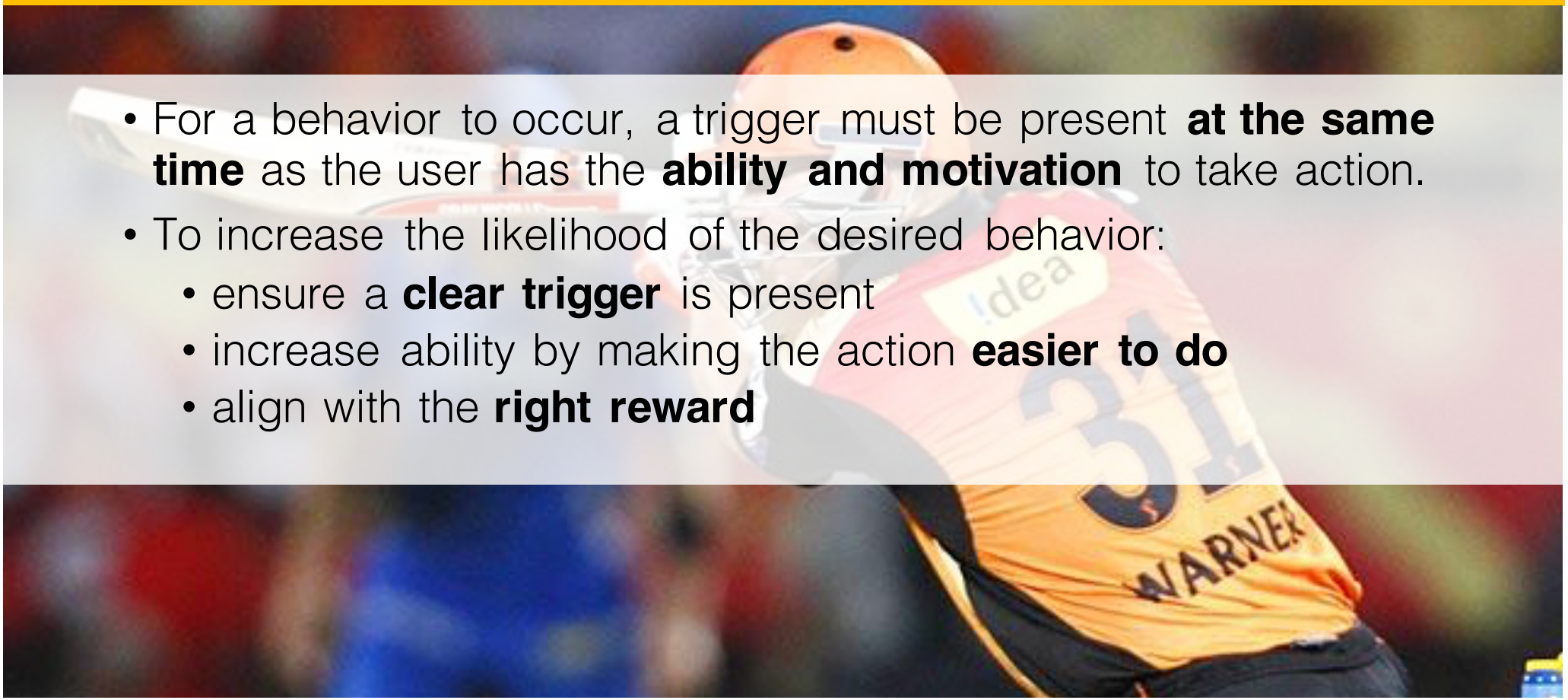
- Help users see themselves as people who would **naturally take the action**.
- Help users build **strong associations** between things they are already familiar with and the new action.
- Provide users with **clear instructions** on what they need to do.

CREATE(VI): Prepare the User



- Ensure users are **motivated** to act.
- Ensure they are cued to **act now**. (Ask them.)
- Ensure they know they are **succeeding or failing**—give them *actionable* feedback.

CREATE(VII): Generate the Action



- For a behavior to occur, a trigger must be present **at the same time** as the user has the **ability and motivation** to take action.
- To increase the likelihood of the desired behavior:
  - ensure a **clear trigger** is present
  - increase ability by making the action **easier to do**
  - align with the **right reward**

CREATE(VIII): Design the Interface

- Use **persona archetypes** as raw material for designing the product. (Either user stories or product requirements.)
- Focus on what the product **needs to do**, and not on how the product should do it.
- **Prototype** the wireframes or mockups with your target audience.

CREATE(IX): Provide the (Variable) Reward

- *Rewards of the tribe:* the search for social rewards fueled by **connectedness** with others.
- *Rewards of the hunt:* the search for **material resources** or **information**.
- *Rewards of the self:* the search for intrinsic rewards of **mastery**, **competence**, and **completion**.

CREATE(X): Generate User Investment

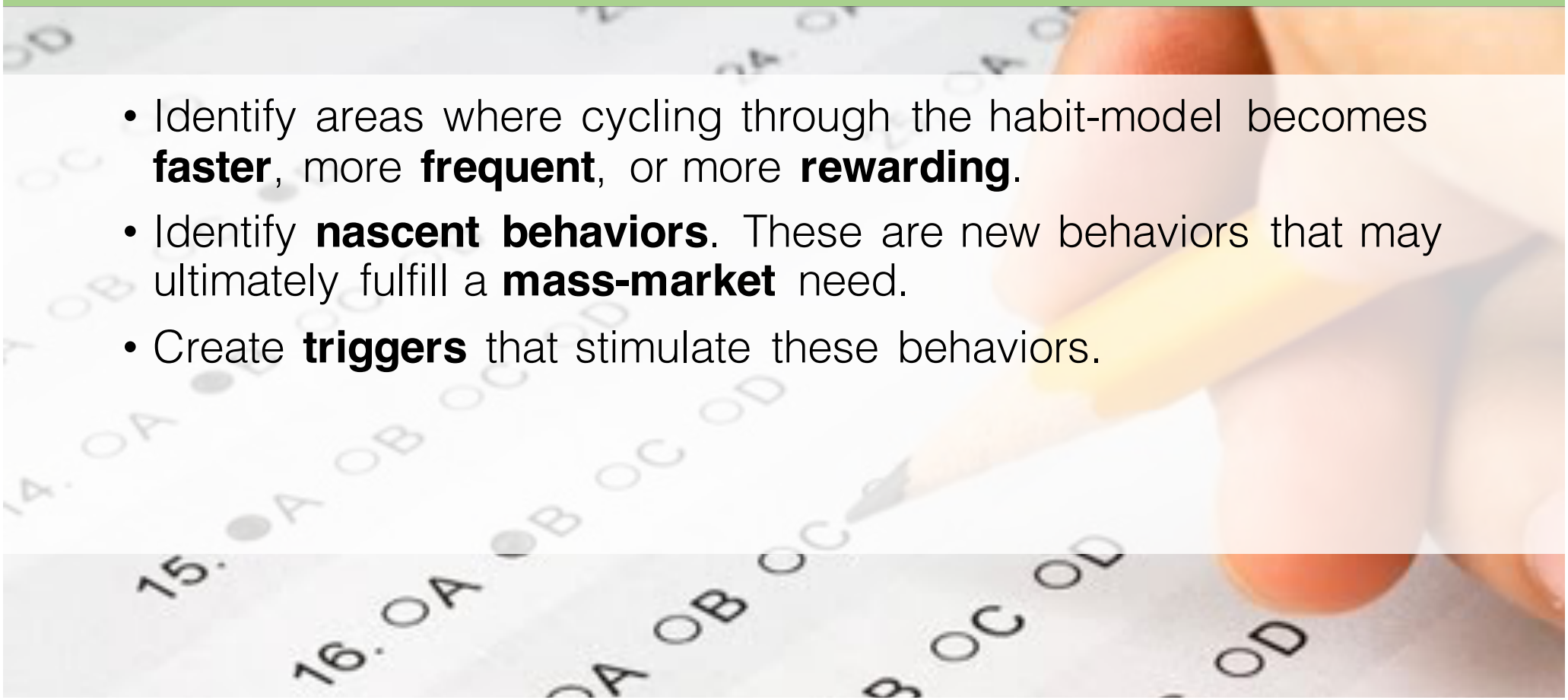
- **Investments in a product** Investments increase the likelihood of users returning by improving the service.
- Investments **store value** in the form of content, data, followers, reputation, or skill.
- Investments increase the likelihood of **users passing through the habit-cycle** by loading the next trigger to start the cycle.

Scale – Creating Mass Behavior Change

Scale: Creating Mass Behavior Change

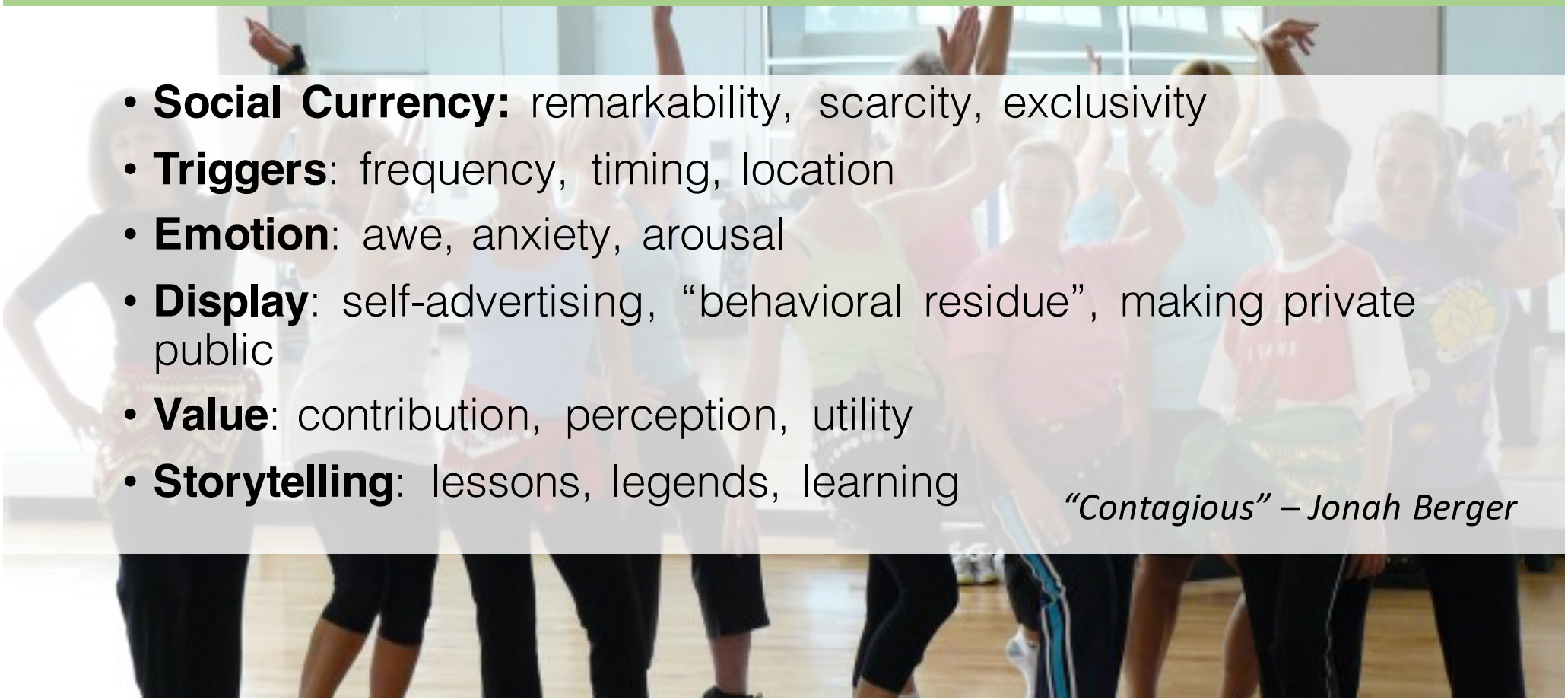
- **Dynamically adjust** content shown to users based on success of past content.
- Explore new content with a **new target minority** of users.
- Add new content **if it is successful** at eliciting the desired behavior in the new target.

Habit Testing for Scale



- Identify areas where cycling through the habit-model becomes **faster**, more **frequent**, or more **rewarding**.
- Identify **nascent behaviors**. These are new behaviors that may ultimately fulfill a **mass-market** need.
- Create **triggers** that stimulate these behaviors.

Make scaling contagious



- **Social Currency:** remarkability, scarcity, exclusivity
- **Triggers**: frequency, timing, location
- **Emotion**: awe, anxiety, arousal
- **Display**: self-advertising, "behavioral residue", making private public
- **Value**: contribution, perception, utility
- **Storytelling**: lessons, legends, learning

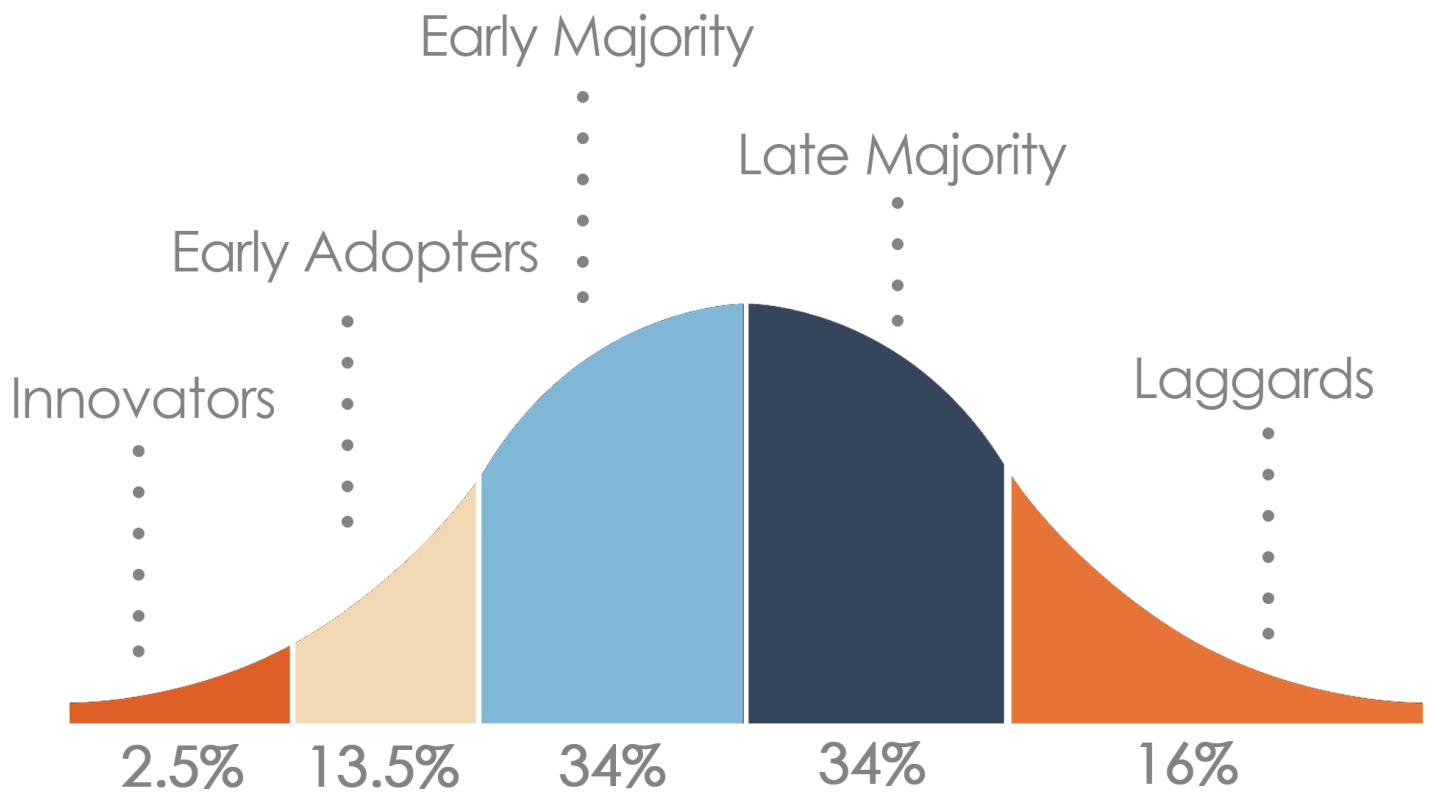
"Contagious" – Jonah Berger

Diffusion of Innovative Products

- Relative **advantage**
- Compatibility with **existing values** and practices
- Simplicity and **ease of use**
- Trialability
- Observable **results**

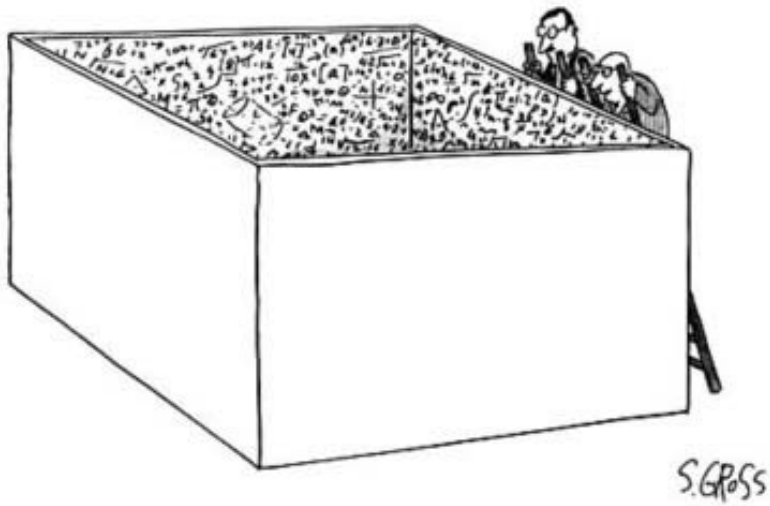
Everett M. Rogers, Diffusion of Innovations, Fifth Edition 2003, Free Press, New York

Diffusion of Innovation Curve



Dealing with Innovators

- Offer strong *face-to-face support* for a limited number of early adopters to trial the new idea.
- *Reward their egos* e.g. with media coverage.
- Promote them as *'fashion' leaders* (beginning with the cultish end of the media market).
- Recruit and train some as *peer educators*.
- Maintain relationships with *regular* feedback.



"Actually, I got some pretty good ideas when I was in the box."

Dealing with the Early Majority

- Offer *give-aways* or *competitions* to stimulate buzz.
- Use mainstream advertising and media stories featuring *endorsements* from credible peers.
- Lower *the entry cost* and guarantee performance.
- Redesign to *maximize ease* and simplicity.
- *Simplify* application forms and instructions.
- Provide *strong* customer service and support.

"We'd like to take a majority position in your poetry."

Dealing with the Late Majority

- Focus on promoting *social norms*: Others like them think it's normal or indispensable.
- Keep refining the product to *increase convenience* and reduce costs.
- Emphasize the *risks of being left behind*.
- *Respond* to criticisms from slow adopters.

"It's serious. You have an allergy to grass and hay."

Dealing with the Laggards

- Give them *high levels of personal control* over when, where and how they use the product.
- *Maximize their familiarity* with the new product or behavior.
- Let them see exactly how other laggards *have successfully adopted* the innovation.

Examples of Healthy Habit-Forming ”Lifehacks”

Examples of Healthy Habit-Forming Lifehacks

- *The Paperclip Method* – James Clear
- *Don't Break The Chain* – Jerry Seinfeld
- *Avoiding Online Distractions* – Nir Eyal
- *Identity-Based Habits* – James Clear
- *The IKEA Effect* – James Norton
- *Sticking to Hard Goals* – Nir Eyal

The Paperclip Method - James Clear

- Place jar of paperclips on one side of desk
- Place empty jar on other side
- Perform repetitive but required task (e.g. cold-calling)
- Move one paperclip from full jar to empty jar
- Repeat until all paperclips have been transferred

Don’t break the chain – Jerry Seinfeld

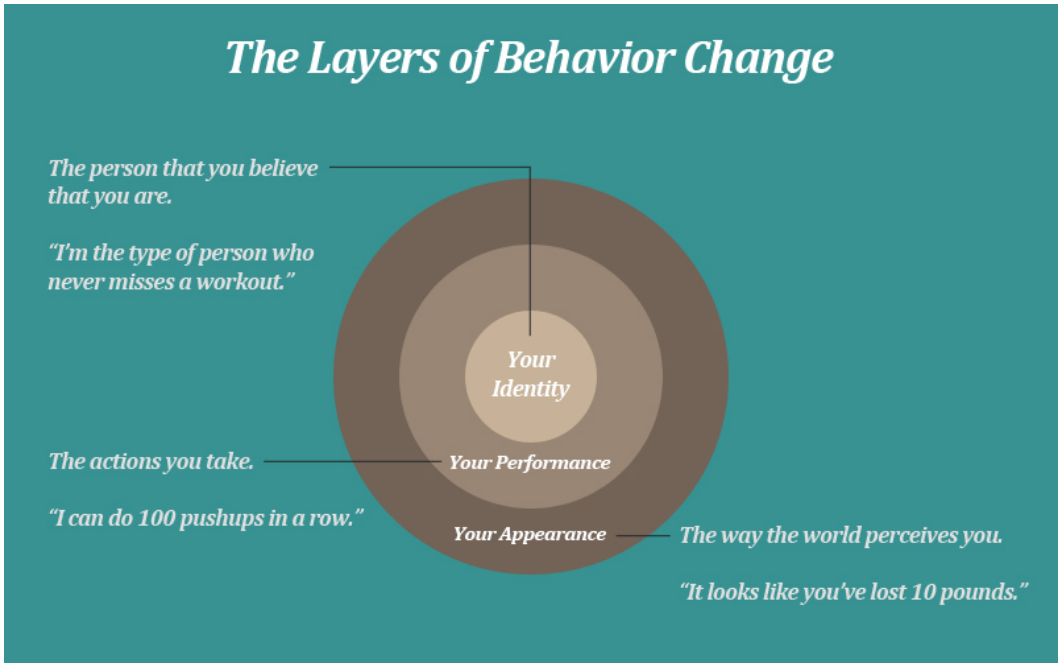
- Get a big wall calendar and a thick marker
- Each day you perform your desired habit mark the day with a big ‘X’
- Keep the ‘chain’ of X’s going for at least 9-10 days
- Don’t break the chain!

Avoiding online distractions – Nir Eyal

- Set timer on smart-plug to turn off at 10pm and turn on at 8am
- Plug Internet router into smart-plug
- Voila! No surfing web or checking email (or Facebook) at night or first thing in morning

Identity-based habits – James Clear

- Identify *an identity* that exhibits the habits you desire
- Decide if you want to be this type of person
- Prove it to yourself with small wins this identity would exhibit
- Don't set yourself goals. Inhabit the identity.



The IKEA effect – James Norton

- Create something (no matter how flawed)
- Take pride in your accomplishment
- Leverage your perceived ”success” to create something new
- Repeat the process for as long as you feel “in the flow”

Sticking to hard goals – Nir Eyal

- Recognize that some behaviors require hard work and deliberate practice.
- Pick such a behavior
- Affix a $100 bill to today's date on the calendar
- Keep a box of matches next to the calendar
- If you don't perform the routine that day – burn the $100 bill!!!

In Conclusion…

"No, it's not water. You seem to be retaining food."

Even if we did understand all the Neuroscience and Behavioral Economics (and we don't….), we still can't fix the mind!

Thank You

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