

## **DEVELOPING MINDSETS** FOR PRODUCTIVE STRUGGLE David Dockterman, Ed.D., HGSE, @dockterman





## THE PLAN

- ► A vision of tenacious learners
- ► The What, How, and Why of tenacious learning
- Developing Learning Mindsets
  - ► Purpose
  - ► Growth Mindset
  - ► Belonging



## **REMEMBER AND SHARE**

- ► Recall a time you learned something that was a stretch
- ...and a time that you failed to master, or even attempt, something where others succeeded.
- ► Share and discuss: what's the difference?





# LEARNING IS ABOUT MORE THAN KNOWLEDGE & SKILLS

## TO DRIVE EARNING What do you expect?

"Everyone should own this book." -CHIP HEATH & DAN HEATH, authors of Made to Strick and Switch

## mindset THE NEW PSYCHOLOGY OF SUCCESS

### HOW WE CAN LEARN TO FULFILL **OUR POTENTIAL**

\*parenting \*business \*school \*relationships

"Will prove to be one of the most influential books ever about motivation." -Po Baowson, author of MurtareShock

CAROL S. DWECK, Ph.D.



## TO DRIVE EARNING What do you expect?

BILL&MELINDA GATES foundation

## Academic Tenacity

Mindsets and Skills that Promote Long-Term Learning

Carol S. Dweck | Gregory M. Walton | Geoffrey L. Cohen







### **CONCEPT PAPER FOR RESEARCH AND PRACTICE JUNE 2015**

## Foundations for Young Adult Success A Developmental Framework





THE UNIVERSITY **OF CHICAGO CONSORTIUM ON CHICAGO** SCHOOL RESEARCH



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Funded by The Wallace Foundation\*



Sources: 1980-2000 Census, 2005-2013 ACS

David Deming, HGSE Professor of Education and Economics



## PRESCHOOL SKILLS They still matter

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# ORGANIZING LARNER CHARACTERISTICS

Aptitude Treatment Interaction

### **INSTRUCTIONAL PSYCHOLOGY:** APTITUDE, ADAPTATION, AND ASSESSMENT

### Richard E. Snow and Judy Swanson

School of Education, Stanford University, Stanford, California 94305

KEY WORDS: learning and individual differences, tutoring, grouping for instruction

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INTRODUCTION
THEORETICAL PROBLEMS
Components of Instructional Theory
Current Tensions
Conclusion
APTITUDES FOR LEARNING
Cognitive Apti tudes
Conative and Affective Aptitudes
Conclusion
ADAPTIVE INSTRUCTION
Microadaptation through Tutoring
Teaching and Learning in Groups
Conclusion
ASSESSMENT: A PROSPECTUS

### **INTRODUCTION**

Instructional psychology narrowly defined is the science of human learning in situations explicitly designed to promote it; its goals are to understand knowledge and skill acquisition and to devise principles of effective instructional

nnu. Rev. Psychol. 1992.43:583-626. Downloaded from www.annualreviews.org Access provided by Harvard University on 07/10/17. For personal use only.



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## THE LEARNER VARIABLES (APTITUDES)

- Snow & Swanson
- ► Cognitive
- ► Conative
- ► Affective

- Shute & Zapata-Rivera
- ► Cognitive
- ► Metacognitive
- ► Affective
- ► Additional

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### UDL

- Recognition
- ► Strategic
- ► Affective

Variables vary - contextual and temporal

## **UDL EXPERT LEARNER FRAMEWORK**

### Resourceful B knowledgeable

- Bring considerable prior knowledge to new learning
- Activate that prior. knowledge to identify, organize, prioritize, and assimilate new information
- Recognize the tools and resources that would help. them find, structure, and remember new information
- Know how to transform new information into meaningful and useable knowledge

- Formulate plans for leanning
- Devise effective strategies and tactics to optimize learning
- Organize resources and tools to facilitate learning.
- Monitor their progress
- Recognize their own strengths and weaknesses as learners
- Abandon plans and strategies that are ineffective

### Strategic B goal-directed

### Purposeful & motivated

- Are eager for new learning. and are motivated by the mastery of learning itself
- Are goal-directed in their learning
- Know how to set challenging learning goals for themselves
- Know how to sustain the effort and resilience that reaching those goals will require
- Monitor and regulate emotional reactions that would be impediments or distractions to their successful learning

## THE BRAIN'S NETWORKS FOR EXPERT, SKILLFUL LEARNERS

Recognition Networks The "what" of learning



Strategic Networks The "how" of learning

How we gather facts and categorize what we see, hear, and read. Identifying letters, words, or an author's style are recognition tasks. Planning and performing tasks. How we organize and express our ideas. Writing an essay or solving a math problem are strategic tasks.

Universal Design for Learning



Affective Networks The "why" of learning



How learners get engaged and stay motivated. How they are challenged, excited, or interested. These are affective dimensions.

source: <u>CAST.org</u>

. . . . .

# LEARNERS VARY IN

WHAT they know and can do HOW they manage their learning

- General knowledge and vocabulary
- Domain knowledge
- Procedural skills
- Technical and research skills
- Domain analysis



## **Neurocognitive Skills: Executive Function**

Cognitive Flexibility Working Memory Inhibitory Control

These EF skills are more often displayed by individuals with the following temperamental or personality characteristics:

Effortful Control Conscientiousness Openness Grit

These EF skills are needed for the following examples of goal-directed behavior:

Self-Control Reflective Learning Deliberate Problem Solving Emotion Regulation Persistence

Planning

Near Synonyms of EF include: Cognitive Control, Executive Attention, Executive Control, Executive Functioning, and Fluid Abilities

### **Temperment and Personality**

## **Goal-Directed Behavior**



# **HARNERS VARY**

## WHAT they know and can do

- Phonological Awareness
- Oral language
- Fluency  $\bigcirc$
- Vocabulary
- Comprehension

Instructional strategies Dockterman 2018

HOW they manage their learning

- Attention
- Empathy  $\bigcirc$
- Focus
- Challenge-seeking
- Help-seeking
- Productive Perseverance
- Strategic learning

## WHY they engage in learning



## **3 LEARNING MINDSETS**

- > Purpose & Relevance: The belief that one's schoolwork is valuable because it is personally relevant and/or connected to a larger purpose
- Growth Mindset: The belief that intelligence can be developed
- **>** Belonging: The belief that one is respected and valued by teachers and peers, and fits in culturally in one's learning environment





## MINDSET SCHOLARS NETWORK



# LEARNERS VARY

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## WHY they engage in learning

- I believe it's worth doing.
- I believe I can learn what I need.
- I believe my group supports me.



# 66

# Student-driven learning only works for learners who know how to drive."

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## - David Dockterman, Ed.D.



# HOW DO WE TURN VARIABLE LEARNERS INTO EXPERT, TENACIOUS LEARNERS?

## LET'S MAKE A WORD CLOUD



. . . . .

## **TEXT A TENACIOUS LEARNER CHARACTERISTIC**

### Complete this sentence. Tenacious learners

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Hart the presentation to use five content. Still so five content? Install the app-or get help of Parity as Parity as any ways



. . . . . . .

# LEARNERS VARY

## WHAT they know and can do

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### Boring but Important: A Self-Transcendent Purpose for Learning Fosters Academic Self-Regulation

David S. Yeager and Marlone D. Henderson University of Texas at Austin

> Sidney D'Mello University of Notre Dame

David Paunesku and Gregory M. Walton Stanford University

> Brian J. Spitzer New York University

Angela Lee Duckworth University of Pennsylvania

Many important learning tasks feel uninteresting and tedious to learners. This research proposed that promoting a prosocial, self-transcendent purpose could improve academic self-regulation on such tasks. This proposal was supported in 4 studies with over 2,000 adolescents and young adults. Study 1 documented a correlation between a self-transcendent purpose for learning and self-reported trait measures of academic self-regulation. Those with more of a purpose for learning also persisted longer on a boring task rather than giving in to a tempting alternative and, many months later, were less likely to drop out of college. Study 2 addressed causality. It showed that a brief, one-time psychological intervention promoting a self-transcendent purpose for learning could improve high school science and math grade point average (GPA) over several months. Studies 3 and 4 were short-term experiments that explored possible mechanisms. They showed that the self-transcendent purpose manipulation could increase deeper learning behavior on tedious test review materials (Study 3), and sustain self-regulation over the course of an increasingly boring task (Study 4). More self-oriented motives for learning-such as the desire to have an interesting or enjoyable careerdid not, on their own, consistently produce these benefits (Studies 1 and 4).

Keywords: self-regulation, motivation, purpose, meaning, psychological intervention

Supplemental materials: http://dx.doi.org/10.1037/a0037637.supp

It's only when you hitch your wagon to something larger than yourself that you realize your true potential and discover the role that you'll play in writing the next great chapter in the American story.

> -President Barack Obama, Wesleyan University Commencement Speech, 2008

Many of the tasks that contribute most to the development of valuable skills are also, unfortunately, commonly experienced as tedious and unpleasant (Duckworth, Kirby, Tsukayama, Berstein, & Ericsson, 2011; also see Ericsson, 2006, 2007, 2009; Ericsson & Ward, 2007; Ericsson, Krampe, & Tesch-Romer, 1993). For example, skills in science, technology, engineering, and mathematics (STEM) are in high demand, and, according to some estimates, jobs in the STEM sector will grow by more than 20% in the next few decades (U.S. Congress Joint Economic Committee, 2012). Yet in a

David S. Yeager and Marlone D. Henderson, Department of Psychology, University of Texas at Austin; David Paunesku and Gregory M. Walton, Department of Psychology, Stanford University; Sidney D'Mello, Department of Psychology and Department of Computer Science, University of Notre Dame; Brian J. Spitzer, Department of Applied Psychology, New York University; Angela Lee Duckworth, Department of Psychology, University of Pennsylvania.

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## **PURPOSE: MAKE IT WORTH DOING**

- ► The content
  - ► It matters for what I want to do
  - ► It matter for the person I want to be
  - ► It matters for becoming part of something big (self-transcendence)









Giant Princess Kinder Surprise Eggs Disney Frozen Elsa Anna Minnie Mickey Play-Doh Huevos Sorpresa



240,77 views

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  - ► It's unpredictable (in a low stakes way)











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  - ► It matter for the person I want to be
  - ► It matters for becoming part of something big (self-transcendence)
- $\succ$  The task
  - It's unpredictable (in a low stakes way)
  - It's my choice (agency)









Choice of how (unless the goal is to teach them a way, in which case choice may be about the what)

## FAILURE IS FUNDAMENTAL TO LEARNING But it still hurts...

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### The Benefit of Generating Errors During Learning

Rosalind Potts and David R. Shanks University College London

Testing has been found to be a powerful learning tool, but educators might be reluctant to make full use of its benefits for fear that any errors made would be harmful to learning. We asked whether testing could be beneficial to memory even during novel learning, when nearly all responses were errors, and where errors were unlikely to be related to either cues or targets. In 4 experiments, participants learned definitions for unfamiliar English words, or translations for foreign vocabulary, by generating a response and being given corrective feedback, by reading the word and its definition or translation, or by selecting from a choice of definitions or translations followed by feedback. In a final test of all words, generating errors followed by feedback led to significantly better memory for the correct definition or translation than either reading or making incorrect choices, suggesting that the benefits of generation are not restricted to correctly generated items. Even when information to be learned is novel, errorful generation may play a powerful role in potentiating encoding of corrective feedback. Experiments 2A, 2B, and 3 revealed, via metacognitive judgments of learning, that participants are strikingly unaware of this benefit, judging errorful generation to be a less effective encoding method than reading or incorrect choosing, when in fact it was better. Predictions reflected participants' subjective experience during learning. If subjective difficulty leads to more effort at encoding, this could at least partly explain the errorful generation advantage.

Keywords: learning, education, errors, generation, metacognition

A central question for educators concerns how to maximize students' retention of learned information. One technique that has been shown to be highly effective is the use of testing: A robust and highly replicated finding from both laboratory and classroom studies is that the very act of retrieving items from memory enhances memory for the tested items, the "testing effect" (see Roediger & Karpicke, 2006a, for a review). Simply inserting tests into the learning process therefore has the potential to provide a powerful boost to the amount of information retained. Indeed, the use of testing to promote learning was one of seven recommendations for educational practice made in a recent guide produced for the U.S. government (Pashler et al., 2007), the seven recommendations being based on "the most important, concrete and applicable principles to emerge from research on learning and memory" (Pashler et al., 2007, p. 1). Moreover, it has been found that the harder the test, and the greater the effort required for retrieval, the greater the benefit to subsequent memory (e.g., Carpenter & DeLosh, 2006; Pyc & Rawson, 2009). The most benefit is therefore to be gained by setting a difficult test.

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However, a difficult test brings with it the risk that the learner may make many errors, and educators may be concerned that these errors will be reinforced by the act of testing, with a consequential harmful effect on learning, a concern that may deter them from making optimal use of testing as a learning tool. Such a concern is not unreasonable in the light of evidence that errors are best avoided during learning (e.g., Baddeley & Wilson, 1994). On the other hand, there is also evidence that generating responses can be beneficial even when many errors are produced, as long as corrective feedback is given (e.g., Kornell, Hays, & Bjork, 2009). A worthwhile goal, then, is to identify the conditions in which errorful generation may be either helpful or harmful to subsequent retention. The current article seeks to contribute toward achieving this goal.

The prevailing view is that a benefit of errorful generation only occurs when there is a preexisting semantic association between cue and target. If this is the case, this could limit the usefulness of testing in situations where errors are likely to be made, but this view is based on just a handful of recent studies, all of which have used artificial tasks and materials that are rather different from those likely to be encountered during real world learning, and it remains to be seen whether an errorful generation benefit could occur in a more typical educational scenario in which students are learning novel information. An important issue, therefore, is to understand more fully the effects of generating errors on memory. and to do so using educationally relevant materials such as might be encountered during real world learning. In the current study, we examined the effect of generating errors during the learning of previously unfamiliar vocabulary items, where there were no preexisting relationships between the cues and targets. To foreshadow, we found that generation could be beneficial to memory even when it produces many errors and even when information to

# A MINDSET FOR PRODUCTIVE FAILURE

Feed the belief. Create the culture.

"Everyone should own this book." -CHIP HEATH & DAN HEATH, authors of Made to Strick and Switch

## mindset THE NEW PSYCHOLOGY OF SUCCESS

### HOW WE CAN LEARN TO FULFILL OUR POTENTIAL

\*parenting \*business \*school \*relationships

"Will prove to be one of the most influential books ever about motivation." -Po Baowson, author of MartureSheck

CAROL S. DWECK, Ph.D.



## **PROTECTING A "SMART" IDENTITY**

- Avoidance only attempting tasks with known (successful) outcome
- study")
- ► Cheating

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Deflection - blaming the teacher/task/others; offering pre-emptive excuses ("I didn't

"smart" can block growth



### TAXI DRIVER'S BRAIN



## FEEDING "INTELLECTUAL HUMILITY"

► Our brains are malleable.





## Roger Federer reveals the main things he'll change to prepare for Mischa Zverev







Federer will prepare differently for Zverev (Picture: Getty)

## FEEDING "INTELLECTUAL HUMILITY"

- ► Our brains are malleable.
- ► We can all, always, improve.



### Young Children Are More Generous When Others Are Aware of Their Actions

### Kristin L. Leimgruber\*, Alex Shaw, Laurie R. Santos, Kristina R. Olson

Department of Psychology, Yale University, New Haven, Connecticut, United States of America

### Abstract

Adults frequently employ reputation-enhancing strategies when engaging in prosocial acts, behaving more generously when their actions are likely to be witnessed by others and even more so when the extent of their generosity is made public. This study examined the developmental origins of sensitivity to cues associated with reputationally motivated prosociality by presenting five-year-olds with the option to provide one or four stickers to a familiar peer recipient at no cost to themselves. We systematically manipulated the recipient's knowledge of the actor's choices in two different ways: (1) occluding the recipient's view of both the actor and the allocation options and (2) presenting allocations in opaque containers whose contents were visible only to the actor. Children were consistently generous *only* when the recipient was fully aware of the donation options; in all cases in which the recipient was not aware of the donation options, children were strikingly ungenerous. These results demonstrate that five-year-olds exhibit "strategic prosociality," behaving differentially generous as a function of the amount of information available to the recipient about their actions. These findings suggest that long before they develop a rich understanding of the social significance of reputation or are conscious of complex strategic reasoning, children behave more generously when the details of their prosocial actions are available to others.

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### Introduction

Human adults are unique in that they perform what appears to be an inordinate amount of generous behavior [1-4]; even more remarkably, empirical evidence indicates that hints of these prosocial tendencies are present even early in development. Research shows that infants as young as eight months of age willingly share toys with family members, peers, and complete strangers [5–7]. At 14 months of age, children will help an adult experimenter complete a goal [8] and will even take a cost to help others by the time they are 20 months of age [9]. Finally, between the ages of two and four, children begin to share resources with others voluntarily [10], even when those resources are easily monopolizable [11–12].

Why do children show prosocial behavior from such an early age? To date, prosocial behavior in children has primarily been explained in terms of intrinsic motivations such as empathy, otherregarding preferences, or a desire for fair outcomes (e.g., [8,10,13– 21]). Under this view, children want to help others because they are motivated by that person's need (see review: [22]). Other psychologists have suggested that prosocial behavior in infants and young children may also be driven by other motivations, such as wanting to prove oneself to be a useful and cooperative in-group member-i.e. wanting to present oneself favorably to others [23]. While a good deal of research has been done to investigate the role of intrinsic motivations on prosocial behavior in children, much less has been done to address the latter- what role, if any, do selfpresentational motivations play in encouraging prosocial actions in young children? Unfortunately, because much of the research on prosocial behavior has been conducted using methods where a beneficiary and/or parent is present and aware of the child's actions (e.g., [21,24]), previous work cannot determine what role, if any, concerns with self-presentation may play in guiding this behavior.

To answer this question, it may be helpful to look at the factors associated with self-presentational motivations and prosocial behavior in adults in an effort to track the developmental trajectory of these tendencies. Recent research suggests that, at least for adults, prosocial actions stem in part from an implicit evolutionarily selfish motivation-to promote one's reputation [25-31]. For the purposes of this paper, reputation is defined as information-based inferences about an agent's character that may serve to inform others of the general nature of his/her possible actions in the future, thus leading to possible future reciprocation or punishment. This is reputation in its most basic instantiation, and research suggests that even young infants respond differently to agents who have good and bad reputations [32–33]. Although they may not be aware of it, adults appear to be selective about the situations in which they choose to act prosocially. Specifically, adults often maximize their performance of generous acts in situations in which there is an audience present to witness their actions [34–43].

Although the presence of an audience clearly affects people's decisions about when to act prosocially, it is not clear that adults realize the extent to which audiences influence their behavior. Indeed, research suggests that people's prosocial tendencies are

## FEEDING "INTELLECTUAL HUMILITY"

- ➤ Our brains are malleable.
- ► We can all, always, improve.
- ► Give status for growth (which must be transparent)
  - Speed and accuracy
  - Ratio of talk time; # of mistakes identified; positive feedback cycle; ...



### You're US

### Great! You really rehearsed that step!

I like the way you responded to that suggestion.

## FEEDING "INTELLECTUAL HUMILITY"

- ► Our brains are malleable.
- ► We can all, always, improve.
- ► Give status for growth (which must be transparent)
  - Speed and accuracy
  - Ratio of talk time; # of mistakes identified; positive feedback cycle; ...
- ► Growth mindset language



## SUPPORT "HOW" TO ACT ON THE WHY

### MINDSET ВLОСК STRATEGY

### **Reflect on Focus and Concentration**

Congratulations! You've completed Block 3 of MATH 180.

### **Getting Focused**

Select which one applies the most:

Intelligence isn't just your ability to memorize information and remember it when you need to. Your ability to maintain and focus your attention affects how intelligent you can become.

As with other skills, you can improve your **focus** and **concentration** with practice. Your level of concentration and focus is directly related to your ability to pay attention. This means that you can practice paying attention, and actually get better at focusing and concentrating.

Scientists have even discovered that concentration can increase connections inside our brain's attention networks. So, the more connections your brain makes, the smarter you become. By focusing and paying attention, you're strengthening your brain, practicing concentration, and learning more!

> How much do you agree or disagree with this statement?

While working in the Learn Zone, I stay focused by paying close attention to lesson videos and the feedback I receive, even if it means doing problems over again.

Agree a lot Disagree a little Disagree Disagree a lot > Explain why you agree or disagree with the statement. **137A** MATH 180



GROW your brain neurons. You have billions of neurons! ✓ You can grow more all the time!

✓ Healthy choices grow healthy brains!

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### Focusing on Concentration

> Describe a situation when you were focused and concentrated while learning something new. How did your focus and concentration make you feel about yourself?

> Describe a situation when you were not focused or concentrated while learning something new. How did your lack of focus and concentration make you feel about yourself?

### **Focus & Concentration Strategies**

Focus and concentration will help you be successful. Use these strategies to plan how to improve your focus and concentration in MATH 180.

CONCENTRATION STRATEGIES	EXPLAIN HOW YOU WILL USE THESE STRATEGIES
Calm Your Mind	My mind feels a little stressed in MATH 180 during One way I will calm my mi
Acknowledge and Release Random Thoughts	I sometimes have random thoughts when working on One way to release these and concentrate is to
Focus on One Thing Only	The most difficult thing to focus on in MATH 180 is One way to direc and attention during class is to
Identify and Eliminate Distractions	l sometimes get distracted in MATH 180 while worki One way to eliminate d during class is to





# DELIBERATE PRACTICE

It's about doing, not just knowing

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SECRETS FROM THE NEW SCIENCE OF EXPERTISE

ALLAUAU ALLAUDU and Robert Pool



## **A PATH FOR GETTING BETTER**

- ► What's the next best thing for me/us to work on?
- How do I know I'm getting better?





## **A PATH FOR GETTING BETTER**

- ► What's the next best thing for me/us to work on?
- How do I know I'm getting better?
- ► What do I do if I'm stuck?







## **A PATH FOR GETTING BETTER**

- ► What's the next best thing for me/us to work on?
- How do I know I'm getting better?
- ► What do I do if I'm stuck?
- How do I stop myself from getting discouraged?





# BELONGING TO A LEARNING CULTURE

## What Google Learned From Its Ouest to Build the Perfect Team

New research reveals surprising truths about why some work groups thrive and others falter.

By CHARLES DUHIGG Illustrations by JAMES GRAHAM

FEB. 25, 2016

The New York Times

Psychological Safety and Learning Behavior in Work Teams

Amy Edmondson Harvard University This pap in a mult of team | member: sonal ris| chologic: and perfe

## **Psychological Safety**

Team members feel safe to take risks and be vulnerable in front of each other.

## Dependability

2

3

Team members get things done on time and meet Google's high bar for excellence.

### Structure & Clarity

Team members have clear roles, plans, and goals.

## Meaning

Work is personally important to team members.

### Impact

Team members think their work matters and creates change.



## CHANNELING CLOVER FOOD always a first time

Dockterman 2018

## THIS IS A PROTOTYPE

We will screw SOMETHING up. We'll screw many things up. tell us when that happens. If you have an ide a that will improve us please speak up prove Well thank you.

Everything we are today, every sin recipe, every thing thing we do, has

been developed with help from our customers.

We invite you to join t ose who are helping us improver day.

Welcome.

Thanks for s



### https://www.youtube.com/watch?reload=9&v=BgRoiTWkBHU

### New Scientist

BRAIN SCANNER 27 May 2016

## Do you get your best work done in coffee shops? Here's why

Brain Scanner is Simon Oxenham's weekly column that sifts the pseudoscience from the neuroscience



### Dockterman 2018

## **BEHAVIOR IS CONTAGIOUS**

- ► We try harder when those around us are.
- We're also more likely to be lazy when those around us are.

## **PARTING THOUGHTS**

- Separate performance assessments from growth activities.
- Reinforce intellectual humility and a learning identity.
- Create a space where it's normal to *learn* from failure.

## THANK YOU. QUESTIONS?

. . . .

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