

# Surprising Evidence about the Motivational Processes Influencing Cyber-learning

Richard E. Clark

Rossier School of Education  
Center for Cognitive Technology  
University of Southern California

[clark@usc.edu](mailto:clark@usc.edu)  
[www.cogtech.usc.edu](http://www.cogtech.usc.edu)

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## Think of a motivation problem

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- Choose a motivation problem facing:
  - People you know at work
  - Students who are enrolled in your courses
  - Your own challenges.
  - Remember the problem, later you'll be asked to analyze it

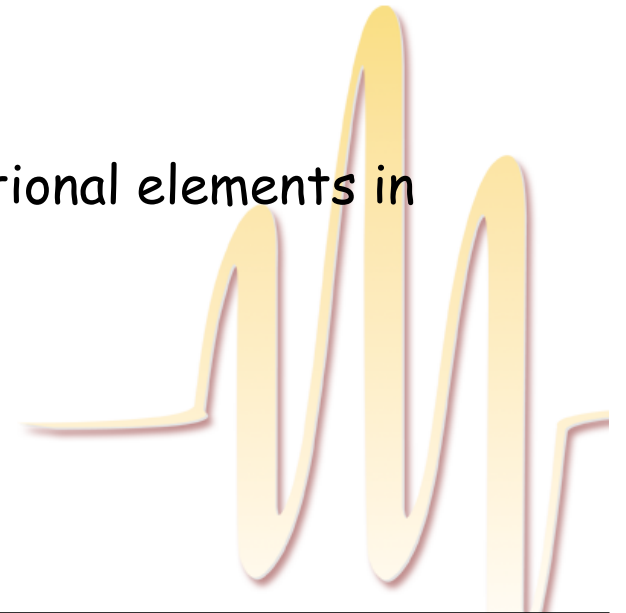




## Topics

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1. What have we learned about cyber-learning motivation that makes it vital to update our assumptions and design.
2. Exciting neuroscience findings about motivation that may advance cyber learning in the future.
3. A suggested framework for future motivational elements in design and research questions.



## Motivation IS Important!

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- 50% of students report that they give only minimum effort when studying
- 84% of students say they could work much harder even though most students report that their goal is to succeed (Spitzer, 1995).
- 30% of variance in learning and 60% of transfer attributable to motivation (Colquitt, LePine & Noe, 2000)



## Assumptions about cyber learning

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- Cyber learning is motivating to most students because it permits them to control their learning.
- Students are aware of the goals they are pursuing and the values and interests that lead them to choose and persist at learning goals.
- Immersive, interactive, realistic cyber worlds and multi-media presentations positively influence attention and motivation.

## Evidence about cyber learning

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- Cyber learning IS INITIALLY motivating to most students because it appears to make learning EASIER.
- Students are NOT aware of the goals they are pursuing and the values and interests that lead them to choose and persist at learning goals
- Immersive, interactive, realistic cyber worlds and multi-media presentations DO NOT positively influence attention and enhance persistence and mental effort

## ■ Why no support for our expectations?

- Learning and motivation are largely unconscious and automated because of limitations on our “working memory” (thinking).
- Instead of  $7 \pm 2$  the limit is  $3 \pm 1$  and anxiety reduces thinking space.
- We have evolved to automate all cognitive activity that is repeated and perceived as successful.
- Motivation is our constant companion so for most of us, it is largely automated to avoid the limits on thinking.

**So what gets automated and why?**

## Expectancy-Control theories of Motivation

- Many psychological studies of motivation have found that it is based on our conscious and non-conscious beliefs and expectations about control.
- Control is defined as our automated expectations that we will receive a reasonable return on goal-directed effort.
- All motivation problems are assumed to be caused by conscious and non-conscious perceptions that we have been denied adequate control and so we cannot be effective
- Different individuals and cultures have automated very different beliefs about what helps or hurts “control” and “effectiveness”

## ■ Motivation Defined as Three Behaviors

Control beliefs influence three motivation outcomes:

1. Starting something new  
Beginning a new task on time
2. Persisting  
Once started, continuing even when faced with distractions
3. Mental Effort  
Investing adequate mental effort to learn something new rather than falling back on inadequate prior learning

(Schunk, Pintrich & Meese, 2008)

## Motivation Problems

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Defined by what is NOT being done.

1. Not starting something new  
Automated avoidance - rationalizing, complaining, procrastinating
2. Not persisting  
Automated interruptions - arguing, doing something less important, procrastinating
3. Not working smart enough - mental effort  
Automated deployment of non-conscious strategies when conscious declarative knowledge is required and so not taking responsibility for lack of achievement

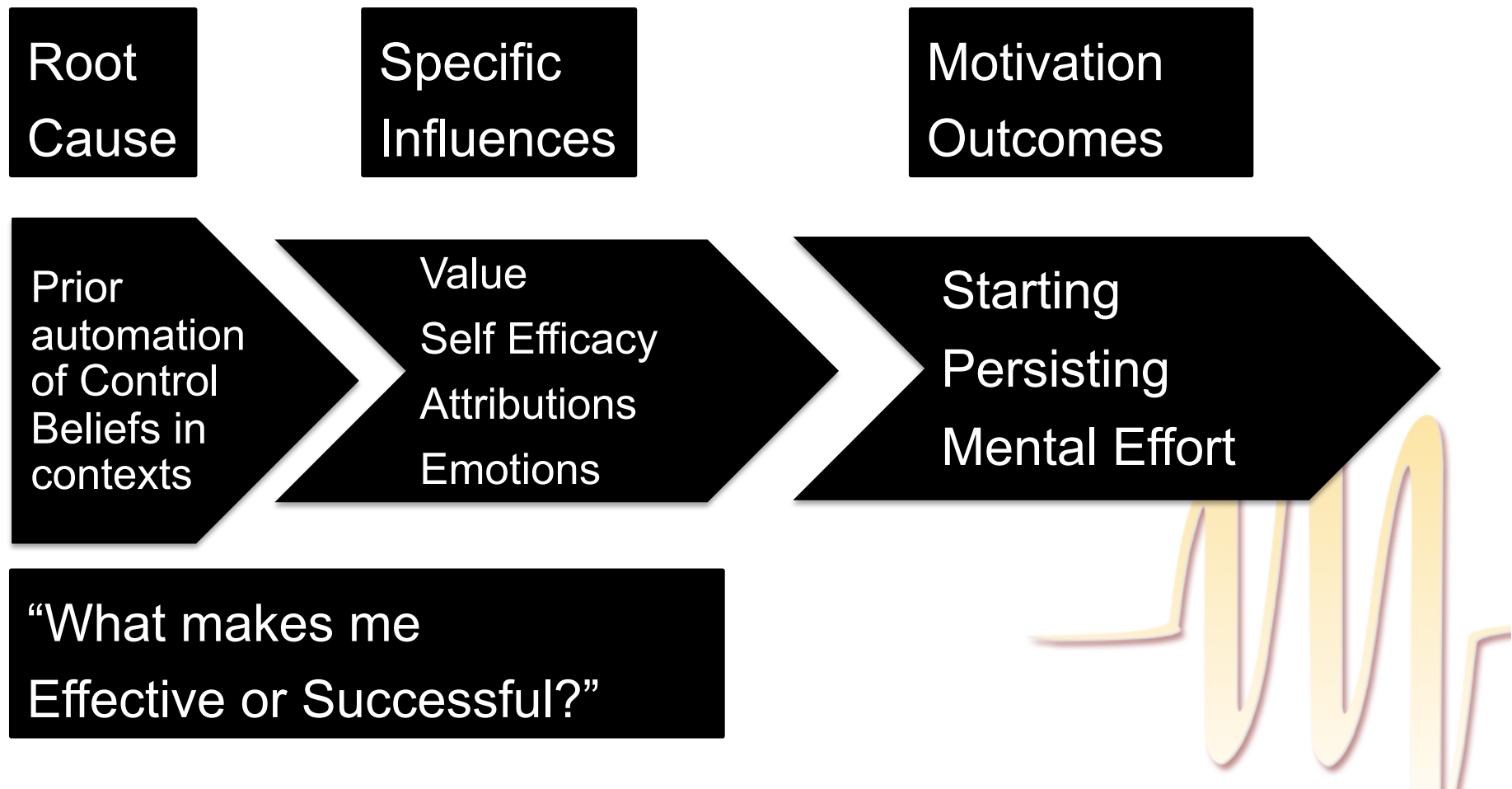
**Which of these three problems characterized the one you selected?**

## Four Individual Differences influencing Motivation

Four types of control beliefs are automated and influence motivation outcomes:

1. We tend to automate value for whatever has made us feel more in control in the past.
2. Our automated self-efficacy is based on the extent to which we believed we succeeded at a task in the past.
3. Our automated beliefs or attributions about the cause of past negative or novel outcomes
4. Our emotions are based on automated control beliefs - anger reflects past external denial of control and depression reflects our own perceived inability

# The Motivation Process

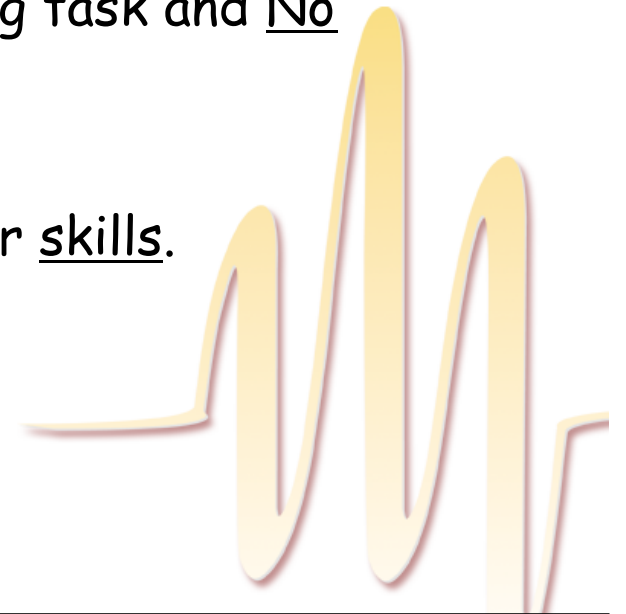


# 1. Values

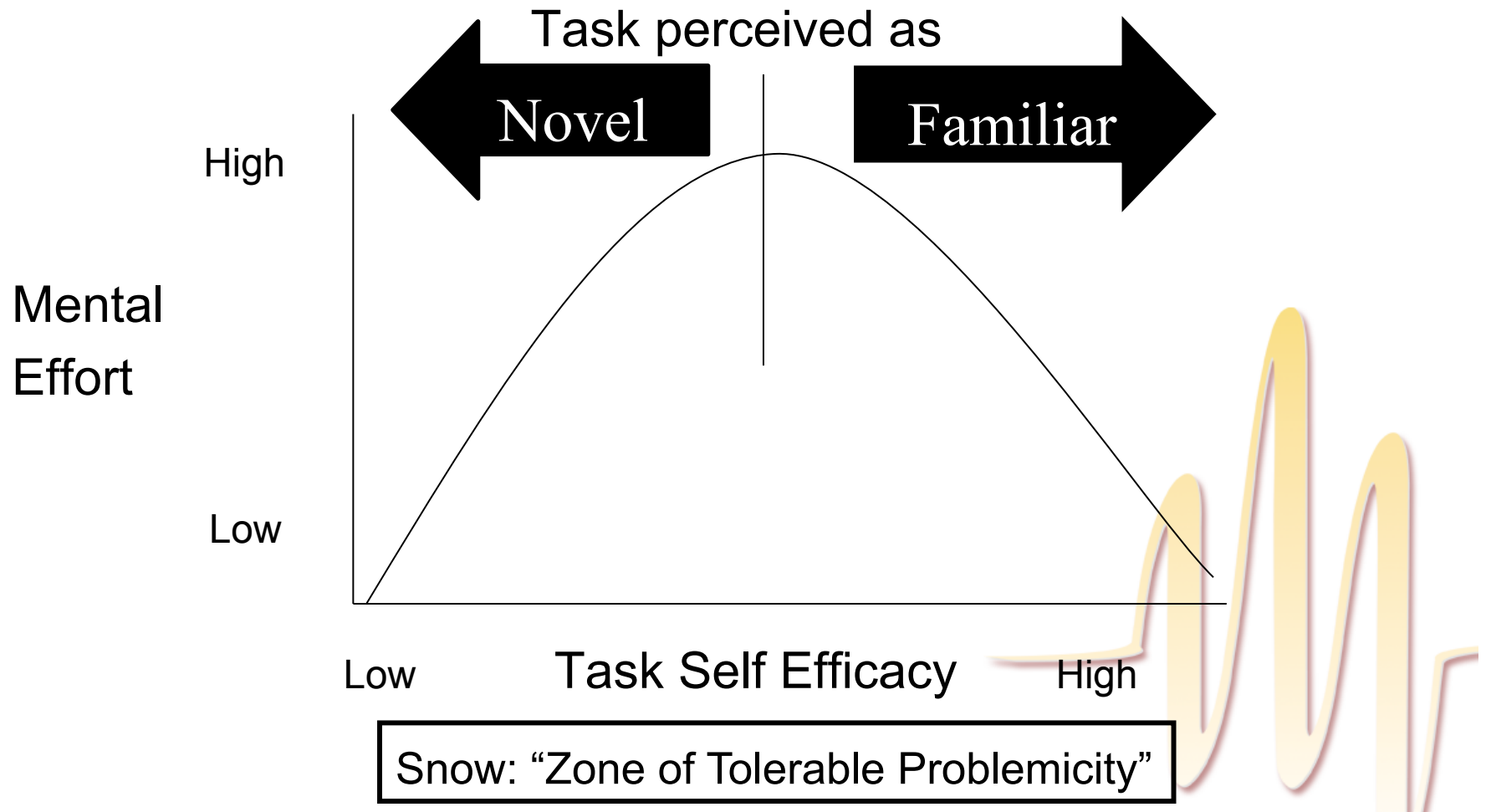
VALUES - 3 Types:

1. Not Interested in the task - likes others better
2. No utility (personal benefit) in completing task and No risk in avoiding task
3. Task does not reflect a person's stronger skills.

(Eccles and Wigfield, 2002)



## 2. Self Efficacy (Bandura, 1999)



### 3. Beliefs (Attributions) about Control

- When we encounter a negative, unexpected and/or novel outcome, we are driven to analyze the cause.
- Poor performance or failure is negative but only harmful motivationally if it is attributed to a cause outside of our control (B. Weiner)
- Westerners have automated the belief that fixed intelligence controls their learning and performance. (C. Dweck)
- Students often non consciously interpret sympathy for failure as "You lack the ability to succeed".
- Choice, persistence and effort occurs when an individual believes that personal (or group) effort will influence outcome

## 4. Emotions

Strong non consciously prompted negative emotions lead to motivation problems:

Anger:

Indicates past experiences that in similar situations something or someone (external) denied them control.

Depression:

Indicates past experience that "I can't control this situation because something in me is "broken" or inadequate and cannot be changed/improved"

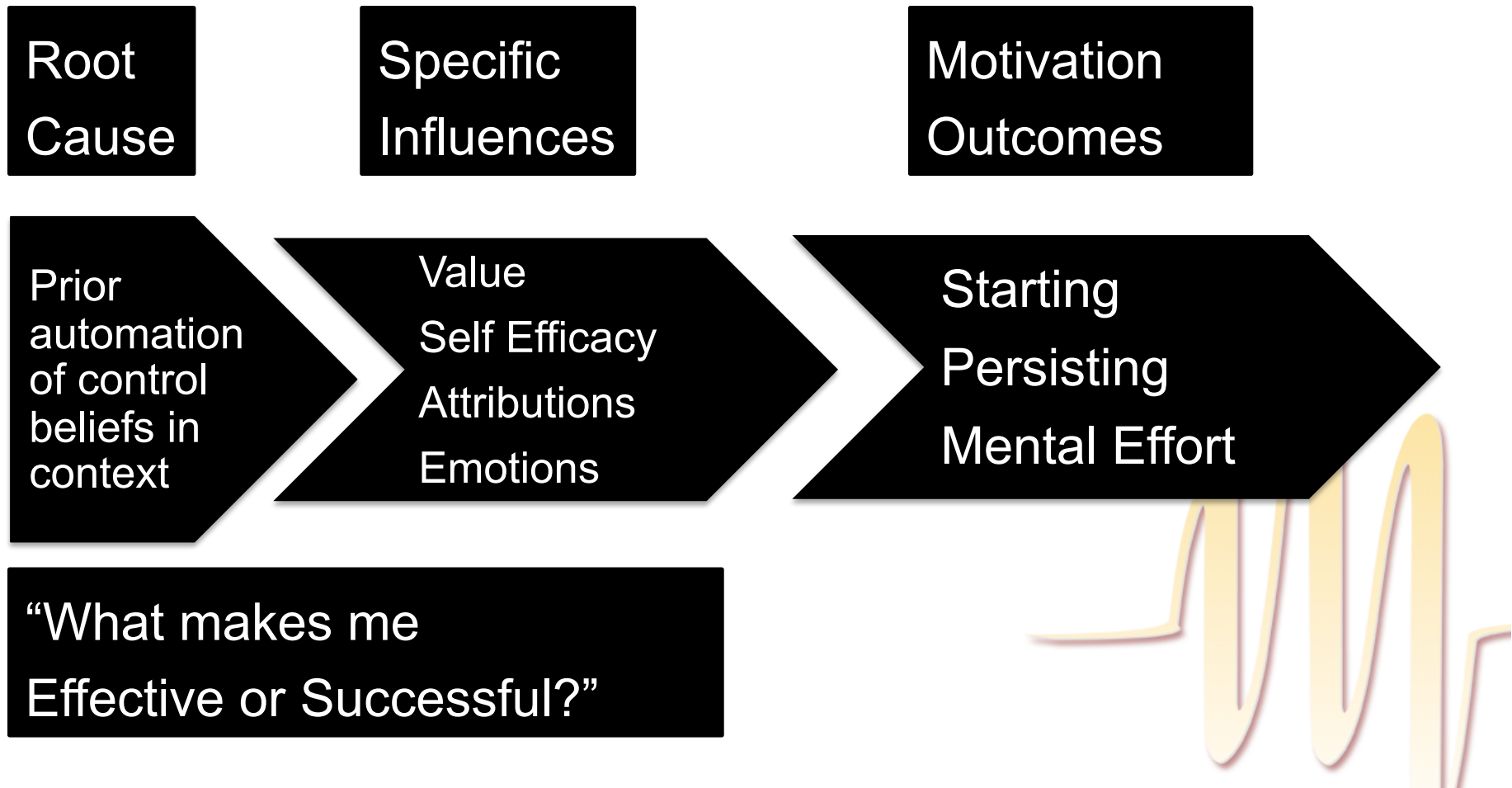
Emotions are byproducts of students attributions about causes  
(Anger = other / Depression = self)

Students with strong negative emotions based on a belief in a lack of control do not start, persist, or invest mental effort

## Summary: Designing Motivating Instruction

1. Set and prime clear, challenging learning goals and deadlines for finishing - monitor starting, persisting and mental effort.
2. Give primes representing compelling personal and team reasons (value) for learning, positive self-efficacy and positive emotion.
3. Give accurate feedback on task achievement and motivation strategies - to support the development of future self-efficacy.
4. Attribute success and failure to effort and strategy not to ability - avoid expressing sympathy for failure or excessively praising success - to automate control attributions.
5. Invest in the study of how we measure, diagnose and modify non-conscious values, efficacy, attributions and emotions.

# The Motivation Process





Questions?

Comments?



Evidence @:

[http://www.cogtech.usc.edu/recent\\_publications.php](http://www.cogtech.usc.edu/recent_publications.php)

Questions @: [clark@usc.edu](mailto:clark@usc.edu)