Surprising Evidence about the Motivational Processes Influencing Cyber-learning

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Think of a motivation problem

- 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

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.
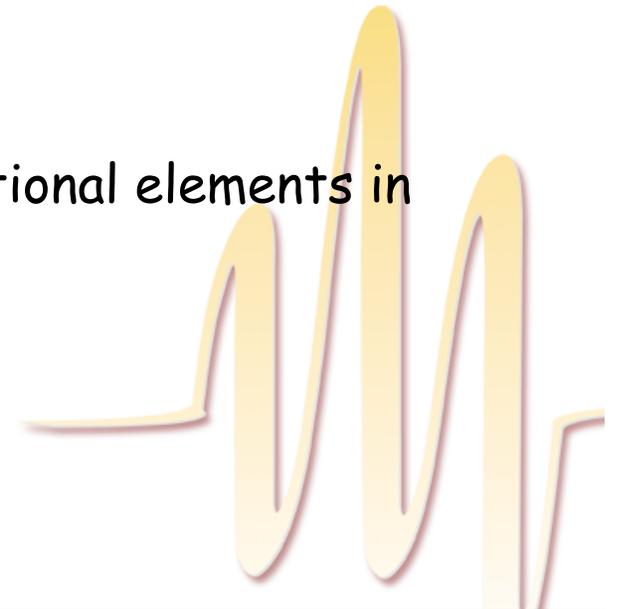
Motivation IS Important!

- 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)
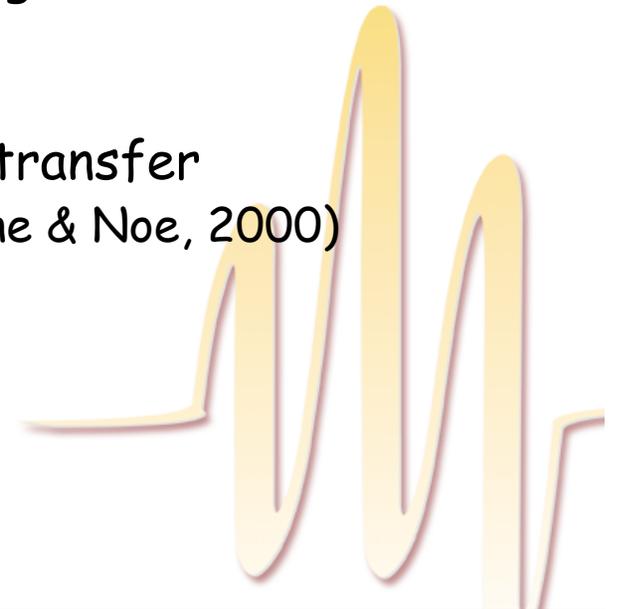
Assumptions about cyber learning

- 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

- Cyber learning <u>IS</u> <u>INITIALLY</u> motivating to most students because it appears to make learning <u>EASIER</u>.

- 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 =/- 2 the limit is 3 =/- 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 <u>beliefs and expectations about control</u>.
  - Control is defined as our automated expectations that we will receive a <u>reasonable return on goal-directed effort</u>.

- All motivation problems are assumed to be caused by conscious and non conscious perceptions that we have been <u>denied adequate control</u> and so we cannot be effective

- Different individuals and cultures have automated <u>very different beliefs</u> about what helps or hurts "control" and "effectiveness"

Motivation Defined as Three Behaviors

Control beliefs influence three motivation outcomes:

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

(Schunk, Pintrich & Meese, 2008)

Motivation Problems

Defined by what is NOT being done.

1. Not <u>starting</u> something new
    Automated avoidance – rationalizing, complaining, procrastinating

2. Not <u>persisting</u>
    Automated interruptions - arguing, doing something less important, procrastinating

3. Not <u>working smart</u> enough – mental effort
    Automated deployment of non-conscious strategies when conscious declarative knowledge is required and so not taking responsibility for lack of achievement
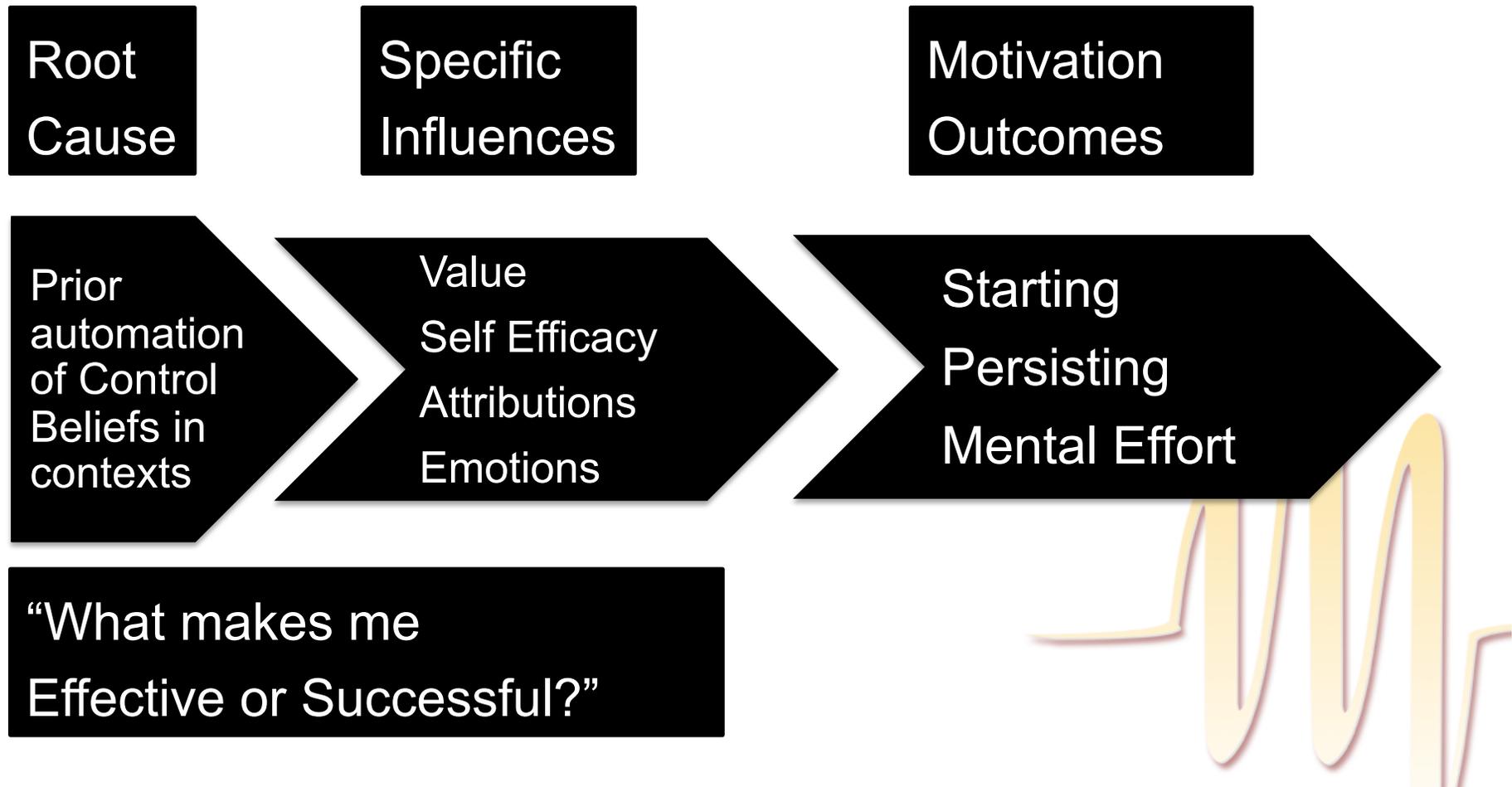
    Which of these three problems characterized the one you selected?

Four Individual Differences influencing Motivation

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

1. We tend to automate <u>value</u> for whatever has made us feel more in control in the past.

2. Our automated <u>self-efficacy</u> is based on the extent to which we believed we succeeded at a task in the past.

3. Our automated <u>beliefs or attributions</u> about the cause of past negative or novel outcomes

4. Our <u>emotions</u> are based on automated control beliefs – anger reflects past external denial of control and depression reflects our own perceived inability

The Motivation Process

Root Cause

Specific Influences

Motivation Outcomes

Prior automation of Control Beliefs in contexts

Value
Self Efficacy
Attributions
Emotions

Starting
Persisting
Mental Effort

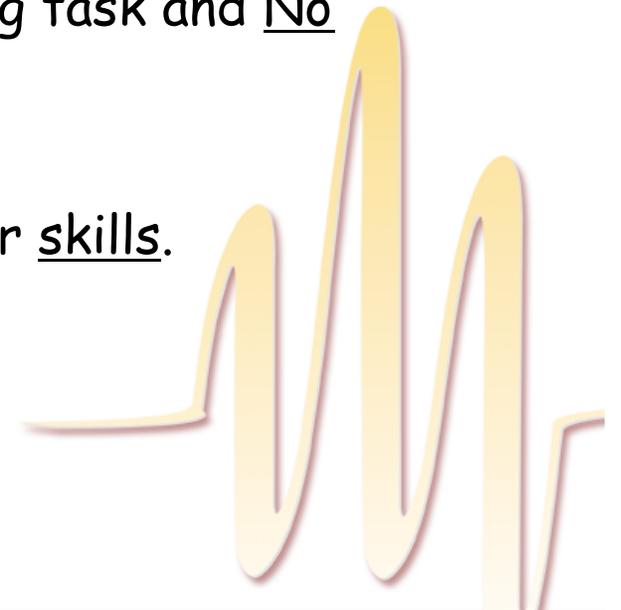"What makes me Effective or Successful?"
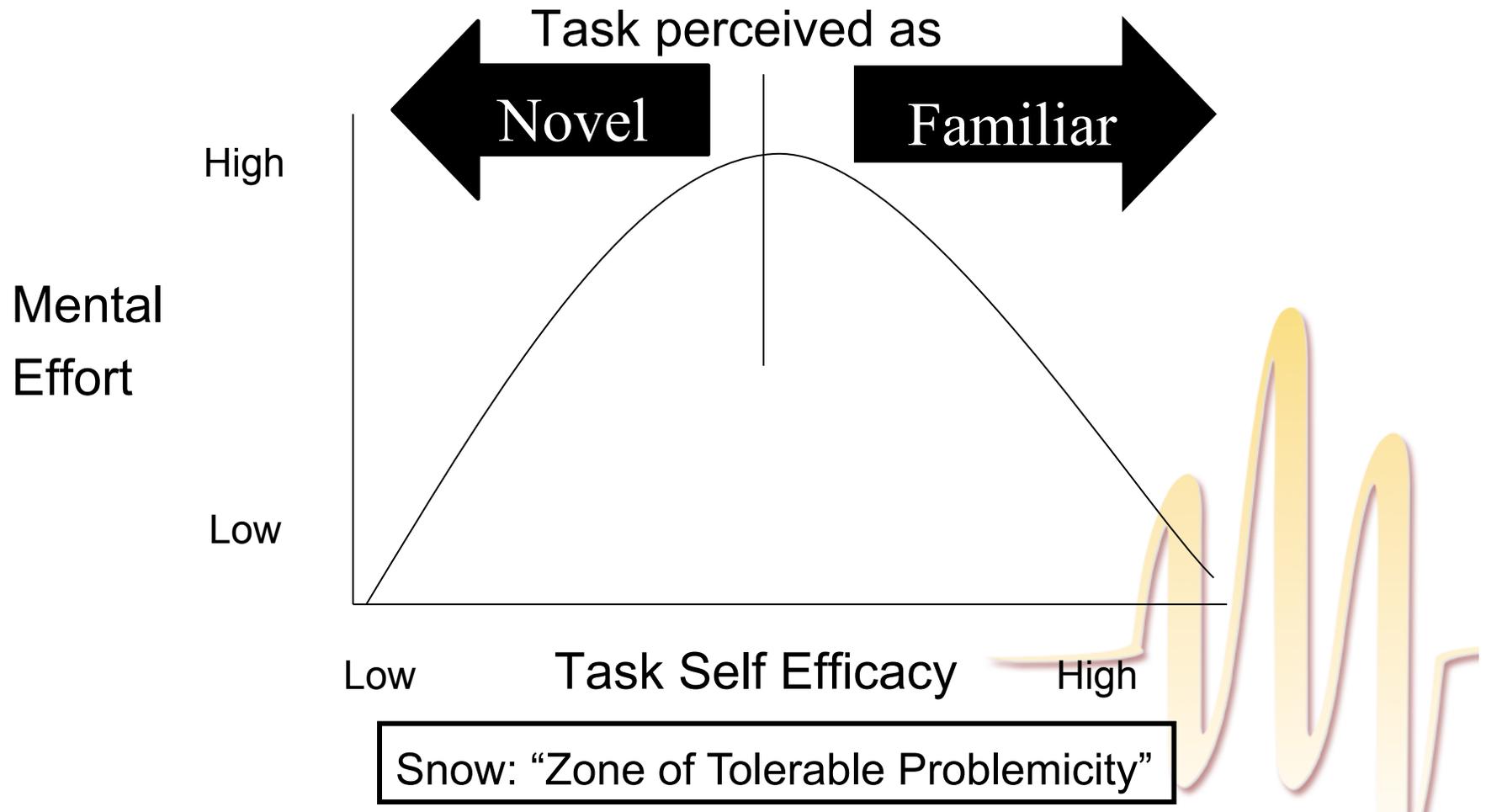
1. Values

VALUES – 3 Types:

1. <u>Not Interested</u> in the task - likes others better

2. <u>No utility</u> (personal benefit) in completing task and <u>No risk</u> in avoiding task

3. Task does not reflect a person's stronger <u>skills</u>.

    (Eccles and Wigfield, 2002)

2. Self Efficacy (Bandura, 1999)

Task perceived as

Novel ← **Familiar** →

Mental Effort

High

Low

Low   Task Self Efficacy   High

Snow: "Zone of Tolerable Problemicity"

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
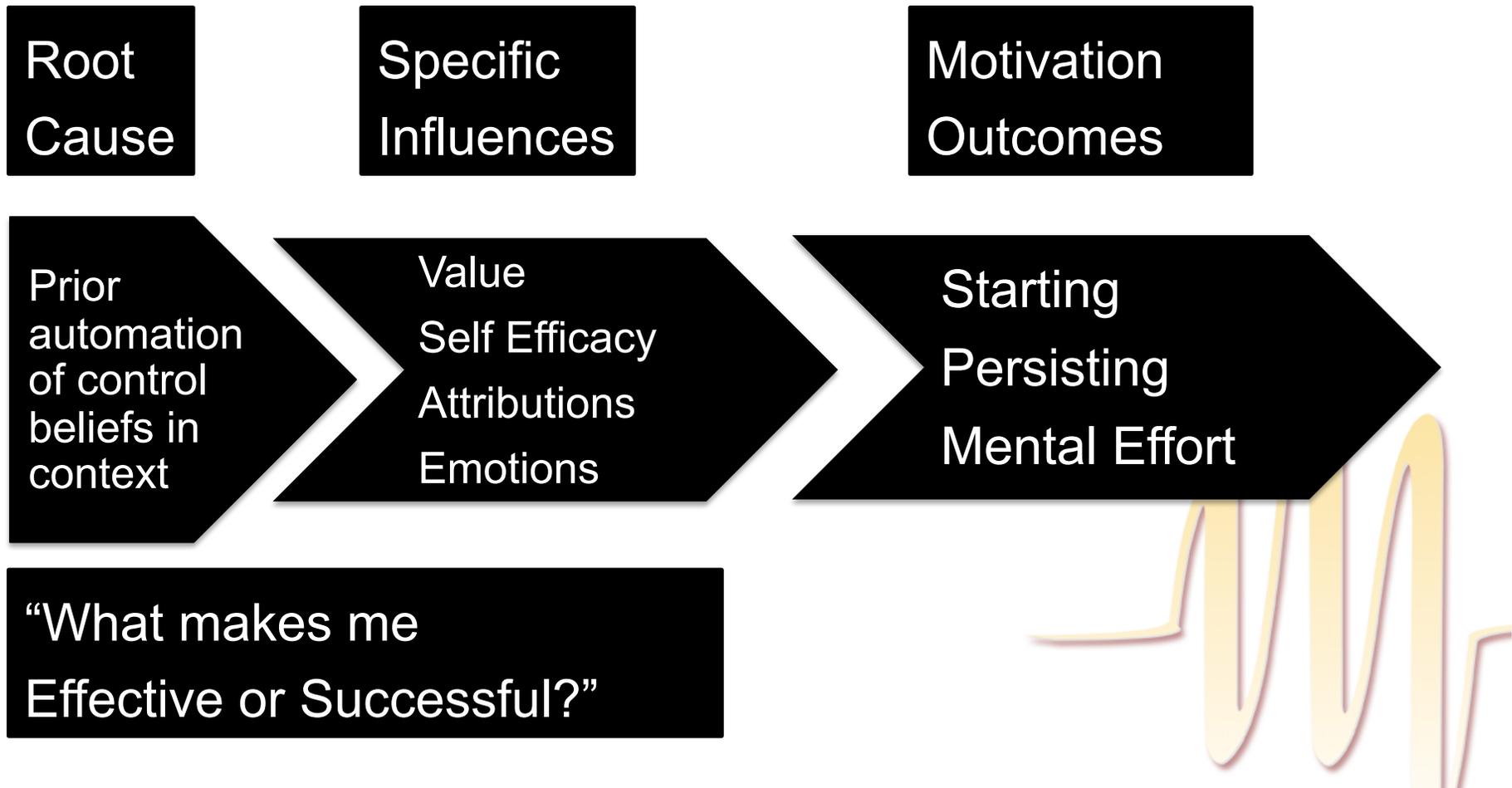   inadequate and cannot be changed/improved"

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

Students with strong negative emotions <u>based on a belief in a lack
of control</u> 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

| Root Cause | Specific Influences | Motivation Outcomes |

Prior automation of control beliefs in context

Value
Self Efficacy
Attributions
Emotions

Starting
Persisting
Mental Effort

"What makes me Effective or Successful?"

Questions?   **Comments?**

Evidence @:

http://www.cogtech.usc.edu/recent_publications.php

Questions @: clark@usc.edu