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Pitfalls of "Hot Thinking": Biases, Negative Habits and Risk-Taking

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Classroom Activity: The Dangers of First Impressions

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HOT THINKING, COLD THINKING

Think Fast or Slow Down?

In the past, research on decision-making viewed it as essentially a rational or logical process. If people had accurate information and weighed their options, they would make good choices. More recently, researchers recognize that it's much more complicated than that. Scholars now understand that we have two important, interconnected systems for processing information:

1. A "hot" or "fast" system, which is intuitive, automatic and reactive; and

2. A "cold" or "slow" system, which is more deliberate, controlled and reasoned.

Both systems are critical for how we process information and make decisions. The "fast" or "hot" system lets us do things seemingly "without thinking," such as walking or ducking when we see an object flying toward us. These decisions are routine or habitual. That's important, because if we had to stop to think about everything, we would quickly become overwhelmed.

The challenge is that it's easy to get swept away in an exciting moment or to give in to what we want with little attention to the consequences (the hot or fast thinking system). So we eat too much, exercise too little, spend too much, study too little or play too many online games. Though all of these (and other choices) seem very different, they all share a common theme: It's easy to let something tempting that's right in front of us take us away from other things we really value for the long term.

So we need to step back, get some distance and cool it. If we want to take the future into account, we have to let cool thinking take control. In an age of instant gratification, that self-control is a critical skill to cultivate in students so they can be successful in school, work and all of life.

This Renaissance Kit provides tools to help young people be more conscious of the different thinking systems as well as strategies they can use to "cool down" when the hot system engages too much.

—Kent Pekel, Ed.D.
President and CEO, Search Institute
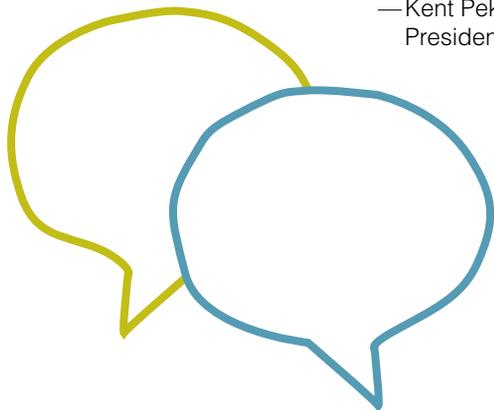
There are two thinking systems, one "hot" and one "cold." Both are important, but a critical part of growing up is to develop the ability of your cold system to monitor and control your hot system. This kind of self-control or self-management makes a difference in many areas of life and allows both systems to work together. These insights from research highlight the interplay of these two critical components of how we think.

The Importance of Self-Control

Self-control is a critical skill that young people need to develop to persevere toward their goals. Otherwise, the immediate attractions can distract them from more abstract or distant priorities, values and goals. Without self-control, we too often make choices we later regret.

Researchers find that inadequate self-control is linked to a range of risky or health-compromising behaviors, including overeating, substance abuse, violent behaviors, overspending and sexually-impulsive behaviors. Higher levels of self-control are associated with students getting better grades and graduating from high school.

However, self-control is a set of skills, not an ill-defined sense of "will power." Researchers have found that even impulsive, aggressive juvenile offenders can strengthen these skills. (This kit introduces some of these skills.) And when we develop self-control in one area (such as overeating), those skills can end up helping us in other, seemingly unrelated areas.

Two Complementary "Thinking Systems"

In the past, researchers and practitioners paid most attention to how young people develop abstract thinking and analytic abilities. That, it was assumed, was the key to improving students' judgment and decision making (which was sometimes called "cold thinking"). However, recent years have shifted to recognizing the value of a complementary decision-making process, which is quick, intuitive and experiential (sometimes called "hot thinking"). We use both systems throughout life.

Each system is really good at some things, but not good at others. In reality, the two work together—we need them both and both need to be developed and connected as we mature. The next page describes what we know about these two systems.

Hot (or Fast) Thinking	Cold (or Slow) Thinking

What It Is

- It is intuitive, automatic, reactive and experiential.
- It operates with little or no effort.
- It includes both automatic responses and developed expertise.
- It is influenced more by social and emotional conditions around it.

Its Strengths

- It does routine things so we don't have to think about them.
- It takes over in an emergency to react quickly and protect us from danger.
- It helps us do things efficiently that we're good at.

Its Limitations

- It causes us to jump to conclusions that may not be accurate.
- It reinforces our biases.
- It makes us overconfident.
- It cannot be turned off.
- It leads us to take risks we wouldn't take if we thought more about them.

What It Is

- It is deliberate, controlled, reasoned, sequential and analytical.
- It takes a lot of effort, focus and concentration.
- It follows rules, compares variables and makes deliberate choices.
- It is the source of self-control, agency and choice.

Its Strengths

- It takes in lots of information to solve complex problems.
- It guides us through situations that are not familiar.
- It challenges false assumptions.
- It helps us develop new attitudes and behaviors when we use it well.

Its Limitations

- It overwhelms us if we try to process too much information at once.
- It takes a lot of energy to use. It is tiring.
- It is too slow to make routine decisions.

How Hot and Cold Thinking Work Together

Like the water faucet that blends hot and cold water to get the mix we need for a particular task, our brains move between hot and cold thinking based on the situation and what we already think. Knowledge and expertise develop out of the interaction of the two systems. Use the "Hot Thinking vs. Cold Thinking" handout to help students understand this concept and think about how to find the right mix.

Hot Thinking: Manages most tasks efficiently. But then something is too complex and needs more attention.

Cold Thinking: It slows down, analyzes the situation and information, and develops a response.

Once you've experienced a situation or task many times, your response becomes more automatic. Expertise develops.
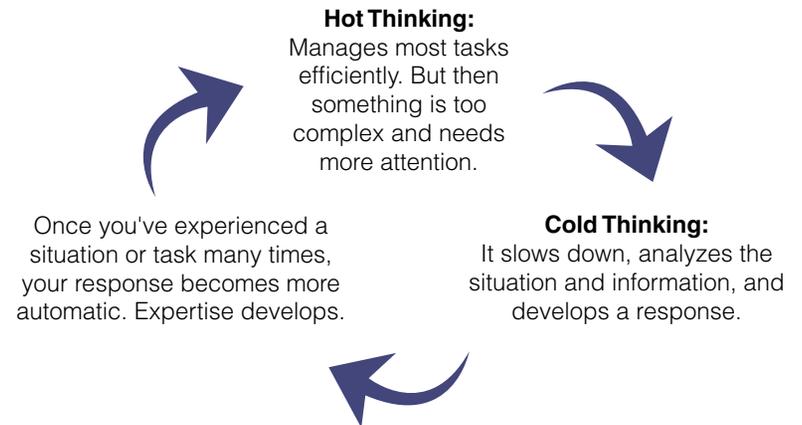
Why Students Struggle with Decision-Making and Risky Behaviors

One of the frustrations and fears of adults about the teenage years is that young people seem to have poor judgment — even when they have developed strong reasoning and analytic skills (cold thinking). What's going on? Researchers are finding that, more than adults, adolescents developmentally are:

- Motivated to seek out novel and exciting experiences;
- Learn more from positive than negative consequences; and
- Take more risks when in the presence of peers (since hot thinking is affected heavily by social influence).

Growing evidence suggests that young people's hot thinking is really open to immediate rewards but has a harder time learning from punishment (which requires engaging cold thinking). In addition, long-term rewards, benefits or punishments can be overshadowed by the immediate feedback to hot thinking, which is more in tune with the emotional and social dynamics of the moment.

However, current neuroscience suggests that the cool system does not fully mature until the early 20s, leaving young people relying on the hot system to help them with many decisions. These dynamics shift as young people get better at coordinating the hot thinking and cold thinking (through executive function).

This maturation increasingly integrates cognitive (thinking), affective (feeling) and social information as part of decision-making. In addition, they develop more mastery of more tasks and situations, which reduces the load on their cold thinking, freeing it to focus more on monitoring the hot thinking. Thus, young people get better at controlling their impulses as they grow through adolescence and into their early 20s.

Pitfalls of "Hot Thinking": Biases, Negative Habits and Risk-Taking

Even though hot thinking is essential for living, it is also the source of biases, both positive and negative, and negative habits. Here are some examples of when hot thinking without cold thinking creates problems:

- We can be so excited about an idea or a project that we don't think through the costs or whether it's realistic.

- We jump to conclusions about a person or place or idea based on our first impressions and simplistic preconceptions and superficial information.

- We automatically do what we've always done when trying to cope with a stressful situation.

- The short-term benefits (satisfying curiosity, having fun or thrills, or positive feedback from friends) can overwhelm our more rational thought processes, leading us to make high-risk choices.

Overcoming these biases and habits isn't easy. It takes time and effort. It requires consciously engaging cold thinking so that it overrides the immediate reaction or unconscious choice of fast thinking. As one of the leading researchers in the field, Daniel Kahneman, put it: "The voice of reason may be much fainter than the loud and clear voice of an erroneous intuition, and questioning your intuition is unpleasant when you face the stress of a big decision."
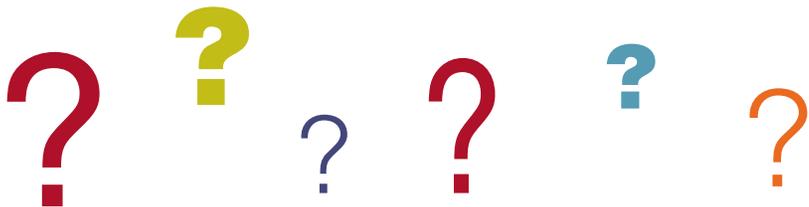
When Systems Get Overloaded

Self-control — or monitoring of hot thinking — requires attention and effort (part of cold thinking). Much of the time, this balance works well for us. However, it can get overloaded in several ways:

- If we are completely focused on solving a challenging problem, our cold thinking has little energy left to monitor our impulses. So we can say or do things impulsively and unfiltered.

- If you have had to force yourself to do something that you don't want to do (thus using lots of self-control), it's much harder to exert that self-control the next time it's needed.

- If you're feeling stressed, unsafe, pressured, or anxious, this overloads your short-term memory (part of hot thinking), which disrupts cold thinking and undermines performance. This stress can be caused by time pressure, a feeling of being judged or watched, or stereotype threat.

Each of these demanding situations drains energy, as the following experiment illustrated. People were asked to control their emotions while watching an emotionally-charged movie. Then they were asked to take a test of physical stamina that involved maintaining a strong grip in spite of increasing discomfort. Those who were asked to control their emotions during an intense movie gave up more quickly than those who hadn't been asked to control their emotions during the movie.

Negative Emotions Undermine Decision-Making and Thinking

When students are having a bad day, it's likely to undermine their ability to think well or control their impulses. (The same is true for teachers and other staff.) That's because we tend to act more rashly when we're experiencing negative emotions.

In one study, researchers asked how well subjects' executive functioning (including both cold and hot thinking) was working in different situations. In one situation, study participants were asked to recall a negative event in their own lives, writing in detail about it for about 10 minutes.

Researchers found that participants performed poorly on a test of executive function when they had been primed with this negative memory — but not when they weren't asked to recall something negative. Furthermore, the combination of low executive function and negative memories reduced their abilities to control their impulses.

Helping Students Manage Hot and Cold Thinking

Students have hot and cold systems for thinking. Hot thinking can express the enthusiasm and energy. Cold thinking helps them learn to analyze, reflect and integrate complex ideas. Parents, teachers, and other adults play important roles in helping young people develop and integrate these two systems for thinking. Here are some ways you can help.

Model self-control

Young people need to see adults use skills to manage those situations when their emotions and impulses urge them to do things they wouldn't do if they took time to think about it.

Examine your own assumptions

We shouldn't ask young people to examine their own assumptions or biases that come from hot thinking if we're not ready to examine our own. Show young people that taking in new information and thinking through issues can change how you view a situation.

Reduce the stress

The more young people have on their minds, the harder it is to make good choices.

Let them practice

The best way to develop self-control and other skills is to practice them. That means adults need to encourage young people to practice self-control skills, avoid situations where hot thinking might take over, and boost their abilities to deal more effectively with new situations.

Allow natural consequences to happen

Behaviors have consequences, both positive and negative. Only when they see the relationship between what they do and what happens to them will they be motivated to develop the sense that they can control their own behaviors.

Encourage youth to slow down, breathe or try a different angle

It's hard to make decisions or be clearheaded in the middle of intense situations or while doing complex thinking. Insist that youth take a break, slow down and look at it in fresh ways. All of this gives space for their cold system to work.

Allow youth to focus on one thing

Switching from one task to another takes a lot of effort, particularly when there's time pressure. Breaking down the task and helping them focus on one thing at a time can help students re-engage their cold thinking rather than being overwhelmed.

Ask questions

Everyone approaches a situation with a particular point of view. Students can convince themselves that something is a great idea—and they get really confident about it. (That's how hot or "fast" thinking works.) Sometimes they need someone to ask questions that press them to step back, do some more analysis and determine if they are evaluating the situation realistically.

Help them learn to trust their intuition

The best decisions are often those that combine head and heart, or both hot and cold thinking. That's particularly important when there isn't a clear-cut, right-or-wrong answer. Though it's important to help young people think it through, they also need to build confidence in their own values and priorities. Sometimes they need to be reminded that their choice will be the right choice for them, even if it's not the popular one or the one that someone else might make.

Show the 5-minute video, "This Is How Your Brain Works," at JostensRenaissance.com/brain to use brain teasers to introduce the key concepts about the two systems of thinking. This can be a springboard to class discussion about decision-making.

There are three activities and worksheets in this kit that explore some of the concepts in this video. They can be used together or individually, as they include similar themes.

Discussion

1. Have students answer these questions:
   - What example or brain teaser in the video was most interesting or puzzling to you? Why?
   - What parts of the video could you relate to the most?
   - What is an example of when you have used your System 1, or hot thinking, to make a decision that System 2, or cold thinking, would have made differently?
   - What are some ways you can turn on System 2 when you are tempted to make a long-term decision using only System 1?

2. Throughout the conversation, emphasize that we get into trouble when we use System 1 (hot thinking) without weighing implications or complexity to make decisions that really should be made by System 2 (cold thinking). System 2 considers our values, goals and longer-term issues, helping us keep from doing things we shouldn't do, even if they seem to be immediately gratifying.

3. How do hot and cold thinking affect how decisions are made on the stock market, in politics or in history?

4. How do advertisers take advantage of our hot thinking to get us to buy their products?

The brain has two basic systems for processing information. The first, sometimes called fast thinking, takes action quickly based on what it sees. It's almost automatic. The second system, slow thinking, is deliberate and analytical. Both systems are important.

The challenge is that it's often easy for the fast thinking system to make choices prematurely without the analysis of the slow system. That can lead to impulse decisions and biased actions, particularly in times of stress (when the systems are overloaded), and it makes it particularly hard to solve problems.

Step 1

Hold up the handout titled "Which Line Is Longer?" (The PDF is also available at JostensRenaissance.com/renkit.) Have students vote. Then ask, "What if I told you that both lines are the same length?" Have a student measure each one to confirm this fact.

Note: Some students will still see the lines as having two different lengths. That's normal—what we know intellectually can be different from what we perceive with our senses

Step 2

Hold up the handout titled "Which Middle Circle is Bigger?" (The PDF is also available at JostensRenaissance.com/renkit.) Have a similar conversation about this, including how the size of the surrounding circle influences their perception.

Step 3

Explain that these classic optical illusions are often used just to show that our perceptions (what we see) do not always match the facts. However, they also illustrate a key part of how our brains work.

Step 4

Introduce the two kinds of thinking:

- "Fast thinking" is intuitive and automatic. The brain processes information quickly and reaches a judgment without us seeming to think about it.

- "Slow thinking" is deliberate, controlled and reasoned. We take in information (sometimes lots of information) before we reach a conclusion or take action. For example, in the first optical illusion, we measured the two lines to analyze which is longer (and found that they are the same).
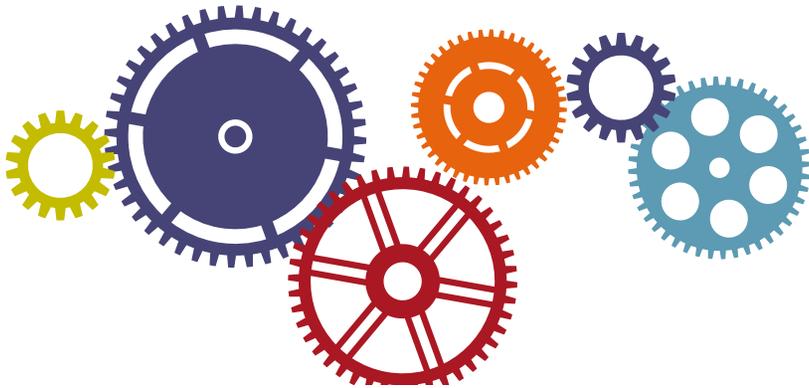
Step 5

Brainstorm as a class about the ways we need each kind of thinking. Write ideas for each on a whiteboard or flipchart. Some examples might include:

Why we need fast thinking	Why we need slow thinking
• We don't have to think about every thing we do (such as ducking when an object is flying toward our head).	• It helps us figure things out that we haven't encountered before.
• We'd be overwhelmed if we had to stop and think through everything.	• We learn how to do new things.
• It makes routine decisions easy.	• It challenges our false assumptions or impressions about things we see, including our biases.

Step 6

Then brainstorm the limitations of each kind of thinking. For example:

Why fast thinking isn't enough	Why slow thinking isn't enough
• Our first impressions may be wrong.	• Sometimes you need to react quickly.
• If we only use this, we never learn anything new.	• Slow thinking takes a lot of time and energy.
• It can lead us to take risks without thinking through the consequences.	• As you get better at something, you need to think less about it. So you can switch back to fast thinking for that.
	• Be more self-motivated and have better decision-making abilities.

Step 7

Reinforce that we need both kinds of thinking to live our lives and solve problems. Talk together about situations when students have used each kind of thinking to help them solve problems. How do we know when to rely more on one kind of thinking than the other?

Step 8

Ask students to reflect privately on an upcoming challenge they're facing and how they can be more intentional about using a good balance of fast and slow thinking. Consider checking back in with them in a week to see how it went.

One of the challenges in self-control is that our hot thinking is triggered by everyday experiences and sensations. We see, smell, hear, touch or taste something, and it triggers feelings and impulsive responses that are hard to control. This activity helps students understand these patterns, and then develop strategies they can try to defuse these triggers.

Step 1
Write the word EAT on a whiteboard. Next to it write SO_P. Ask students immediately to guess the missing letter. Note that most people immediately fill in the blank with a "U" for SOUP.

Step 2
Erase the word EAT and write the word WASH. Ask: Does that change your reaction to how you would fill in the blank? Note that most people will immediately think of SOAP.

Step 3
Explain some of the key ideas about priming and triggers:

• A part of hot thinking is that our brain automatically fills in information based on the context. It's called the "priming effect." Most of the time, it's an efficient way for us to process information with the least effort.

• However, it can also get us into trouble, if it primes us to do things that are not in our own best interests.

• That usually happens when the priming is something we experience or sense that taps, or triggers, our emotions. Those emotions, which are central to hot thinking, make us want to react without thinking. A trigger is something that primes your hot thinking to react.

• Unless we have strong self-control, we end up reacting to these triggers and doing things that we wouldn't have done if we had stopped to think about it.

Step 4
Have students brainstorm a list of things that trigger an emotional or impulsive reaction. Usually things we see, hear, touch, smell or taste trigger memories or habits. We each have different triggers, so some things people say won't be triggers for others. If needed, give some examples of triggers:

• A teacher announces a pop quiz (which can trigger anxiety).
• You see or smell your favorite cookies (which makes you want to eat several).
• You go to the movies and get hungry for popcorn (because you always have popcorn at the movies).

Note that your reaction to these things will be different depending on your experiences. If you never get popcorn at the movies, that won't be a trigger for you.

Step 5
When students have generated a variety of ideas, note that some triggers are helpful because they remind us to do things we want or need to do. But some are problematic because they cause us to do something that isn't good for us or that undermines our values, priorities or goals.

Additional Opportunities

Have students get into groups of three or four. Have each small group pick one of the triggers from the brainstormed list. Have them discuss these three questions:

• What is it about this situation that makes it a trigger for someone?

• How might the hot reaction to this situation lead to negative choices?

• What strategies could someone in this situation use to defuse this trigger?

Then have each group share its two or three best ideas for defusing its trigger. See if some ideas come up in multiple situations. If students would value these ideas, have someone create a poster or handout with these tips to share with the whole class. Suggest they write themselves a reminder in a calendar or notebook to defuse their own triggers in the future.