Research about Feeling and Thinking

Introduction

Scholars since Plato have drawn a clear distinction between thinking and feeling. Now science suggests that our emotions are what make thought possible.

Author

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Source

http://www.boston.com/news/globe/ideas/articles/2007/04/29/hearts__minds/

Structured version

Tom Kimball has structured this version of Jonah Lehrer's research article, using concepts, principles, and guidelines of KnowSys.

Purpose: Use this version to allow random access to same content.

Turning point for metacognition

A turning point for metacognition occurred just over 50 years ago, when a group of brash young scholars at an MIT symposium introduced a series of ideas that would forever alter the way we think about how we think.

Cognitive revolution

The MIT scholars —

- ignited the cognitive revolution in three groundbreaking papers, including one on grammar by a 27-year-old linguist, Noam Chomsky.
- built the cognitive revolution on the radical notion that it is possible to study the actual processes of thought with scientific precision.

Psychology free from behaviorism

The cognitive revolution movement eventually freed psychology from the grip of behaviorism.

Note: Behaviorism was a scientific movement popular in America that studied behavior as a proxy for understanding the mind.

Insights from cognitive psychology

Cognitive psychology has fueled a generation of productive research, yielding deep insights into many aspects of thought, including —

- memory,
- language, *and*
- perception.

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Harvard celebrates a true paradigm shift

Tomorrow, 30 April 2007, Harvard University is celebrating the 50th anniversary of this intellectual achievement with a discussion, featuring Chomsky and other luminaries of the revolution — a true paradigm shift.

Note: Tomorrow's event at Harvard is from 4 P.M. to 6 P.M. in the Science Center, Hall B. It is free and open to the public.

Another revolution about feeling and thinking

Even now as Harvard and the field celebrate the 50th anniversary of a true paradigm shift, another revolution is underway, building on more than a decade of mounting work.

Researchers have discovered that it is impossible to understand how we think without understanding how we feel.

Dividing emotions and cognition

Scholars since Plato have drawn a clear distinction between thinking and feeling. Cognitive psychology tended to reinforce this divide: emotions were seen as interfering with cognition; they were the antagonists of reason.

Marvin Minsky, on emotions distinct from thinking

Marvin Minsky, a professor at MIT and pioneer of artificial intelligence said,

"Because we subscribed to this false ideal of rational, logical thought, we diminished the importance of everything else. Seeing our emotions as distinct from thinking was really quite disastrous."

Proponents connect emotion and cognition

New scientific appreciation of emotion is profoundly altering the field.

The top journals are now filled with research on the connections between emotion and cognition. New academic stars have emerged, such as:

- Antonio Damasio of USC,
- Joseph LeDoux of NYU, *and*
- Joshua Greene, a rising scholar at Harvard.

Influx of neuroscientists

The thinking-feeling connection has been underscored by an influx into the field of neuroscientists armed with powerful brain-scanning technology.

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Elizabeth Phelps on brain anatomy

Elizabeth Phelps, a cognitive neuroscientist at NYU, said:

"The brain is a category buster. When you look at the actual anatomy of the brain, you quickly see that everything is connected."

Field reactions to emotion studies

Scientists in the field have largely welcomed the new emotion studies, which have —

- yielded discoveries that are widely acknowledged as important.
- generated enthusiasm even among the leaders of the cognitive revolution.
- have helped ground cognitive psychology in the real world.
- *Note:* Cognitive psychology has had a penchant for the abstract.
- uncovered important science behind everything –
  - from how people decide what to buy in a supermarket
  - to how they make weighty moral decisions.

Jerome Bruner on getting grounded in reality

Jerome Bruner, a NYU psychologist and luminary of the cognitive revolution, said:

"People were coming up with all these lovely theories that don't relate to anything that's going on in the real world. If we can get back to a sense of cognition that's more grounded in reality, then that's a good thing."

Note: Bruner will speak at the Harvard symposium on 30 April 2007.

Mind-computer metaphor

The cognitive revolution was guided from its inception by a metaphor: the mind is like a computer.

We are a set of software programs running on three pounds of neural hardware. Cognitive psychologists were interested in the software.

Notes: "The mind is like a computer" is actually a simile, not a metaphor.
This hyperlink goes to a summary of concepts. Search there.

Computer metaphor stimulates breakthroughs

The computer metaphor helped stimulate some crucial scientific breakthroughs: it —

- led to the birth of artificial intelligence, *and*
- helped make our inner life a subject suitable for science.

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Ability to simulate human thought

Cognitive psychologists were able for the first time to simulate aspects of human thought.

Herbert Simon and Allen Newell announced that they had invented a "thinking machine:" basically, a room full of vacuum tubes capable of solving difficult logical problems.

Notes:

- The machine even improved on the work of Bertrand Russell in one instance.
- Simon and Newel presented this information on 11 Sep 1956 at the seminal MIT symposium.

Insights into mental processes

These simulations grew increasingly sophisticated over time.

Cognitive psychologists gained important insights into the actual functioning of some basic mental processes, like learning and memory.

They did this by "reverse-engineering" the mind.

Center for developing the field

Much of the work developing the field was done at the Harvard Center for Cognitive Studies.

Note: Jerome Bruner and George Miller founded the Center in 1960. Miller is now an emeritus professor of psychology at Princeton Univ.

Limits to working memory

George Miller spoke at the 1956 symposium. He described how our working memory could contain only about seven bits of information at any given moment.

According to Miller, the mind dealt with this limited "channel capacity" by constantly grouping our sensations into "chunks."

This suggested that the unconscious brain did crucial acts of cognition without our awareness.

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Computer metaphor misleads us

The computer metaphor was misleading, at least in one crucial respect:
computers don't have feelings.

Feelings didn't fit into the preferred language of thought.

Value of emotions diminished

Cognitive psychologists diminished the importance of feelings, because emotions weren't reducible to bits of information or logical structures.

Joseph LeDoux, a neuroscientist at NYU, said:

"They regarded emotions as an artifact of subjective experience, and thus not worthy of investigation."

Focus on cognition

The focus of cognitive psychologists on cognition required them to diminish the value of emotions. At the time, emotions just seemed too mysterious.

In part, this was a necessary omission.

Cognitive psychologists aggressively defended their approach. Inevitably, they focused on the facets of cognition they could best understand.

Early cognitive psychologists focused on the features of mind that seemed most machine-like, such as the construction of grammatical sentences.

Inner processes irrelevant to behaviorists

The behaviorists disregarded inner mental processes as irrelevant and unscientific, because they couldn't measure them.

The behaviorists were eager to expunge anything that smacked of Freud or introspection. They attacked cognitive psychology as lacking rigor.

Note: Chomsky quipped that defining psychology as the science of behavior was like defining physics as the science of meter reading.

Steven Pinker, panel moderator

Steven Pinker, a Harvard psychologist and moderator of tomorrow's panel, said:

"These were nerdy guys interested in the nerdy aspects of cognition. It's not that our emotions aren't interesting topics of study, but these weren't the topics that they were interested in."

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Damasio challenges assumptions about emotions

Antonio Damasio, a USC neuroscientist, has played a pivotal role in challenging the old assumptions and establishing emotions as an important scientific subject.

When Damasio first published his results in the early 1990s, most cognitive scientists assumed that emotions interfered with rational thought.

Damasio studies brain-injured patients

Persons without any emotions should be better thinkers, since their cortical computers could process information without any distractions.

Antonio Damasio put this idea to the test: he —

- sought out patients who had suffered brain injuries that prevented them from perceiving their own feelings.
- found that the lives of these patients quickly fell apart, because they could not make effective decisions –
  - some patients made terrible investments and ended up bankrupt;
  - most patients spent hours just deliberating over irrelevant details, such as where to eat lunch.

These results suggest that proper thinking requires feeling.
Pure reason is a disease.

Examples of emotional processing

Scientists are now finding more examples of emotional processing almost everywhere they look.

1. A study led by Brian Knutson of Stanford University, published last January, demonstrated that our daily shopping decisions depend on the relative activity of various emotional brain regions.
   What we end up buying is largely dictated by these instant feelings, and not by some rational calculation.
2. Harvard psychologist Joshua Greene used brain imaging in 2004 to demonstrate that our emotions play an essential role in ordinary moral decision-making.
   Whenever we contemplate hurting someone else, our brain automatically generates a negative emotion. This visceral signal discourages violence.

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Psychopaths suffer from severe emotional disorder

Joshua Greene's data builds on evidence suggesting that psychopaths suffer from a severe emotional disorder — that they can't think properly, because they can't feel properly.
James Blair, a cognitive psychologist at the National Institute of Mental Health, said:
"This lack of emotion is what causes the dangerous behavior."

Rediscovery of the unconscious

The new science of emotion has brought a —

- new conception of what it means to think, *and*
- rediscovery of the unconscious, in some sense.

Measuring the brain

When the cognitive revolution began five decades ago, scientists could not have imagined ways of measuring the brain that they have developed now.

Researchers can make maps of the brain at work, and literally monitor emotions as they unfold, measuring the interplay of feeling and thinking in colorful snapshots.

We aren't aware of this mental activity, because much of it occurs unconsciously. It plays a crucial role in governing all aspects of thought.
The black box of the mind has been flung wide open.

Imaging brain activity

Scientists say that the field is moving toward the increasing use of sophisticated imaging.

Consequence of integrating with neuroscience

Some cognitive psychologists worry that this "trend to integrate with neuroscience" means that some aspects of cognition will be neglected.

Steven Pinker said:

> "Everybody is now looking at these very big mental processes, like attention or emotion.
> But I think that one of the great things about the cognitive revolution is that it went all the way down to the detailed rules and algorithms used by the mind. I hope we don't lose that."

Pinker hopes the Harvard commemoration will lead people to reflect on the cognitive revolution, to think about "what it got right and what it got wrong."

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Describing the mind

The lasting influence of the cognitive revolution is apparent in the language that neuroscientists use when describing the mind.

Example:

Neuroscientists often describe the unconscious as a massive computer, processing millions of bits of information per second.
Emotions emerge from this activity.

Feelings can be seen as —

- responses to facts and sensations that exist beyond the tight horizon of awareness,
- messages from the unconscious, *and*
- conclusions reached after considering a wide range of information — they are the necessary foundation of thought.

Jonathan Haidt

Jonathan Haidt, a social psychologist at the University of Virginia, recently wrote:

> "It is only because our emotional brains work so well that our reasoning can work at all."

Metacognition references added by the structuring editor

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