COGS 1 GUEST LECTURE:

DISTRIBUTED COGNITION & COGNITIVE ETHNOGRAPHY

10/23/2018
Dr. Taylor J. Scott
tjscott@ucsd.edu
MY OFFICE HOURS ARE:

Wednesday, 10a-12p, CSB 247
You are welcome to stop by and chat!
Distributed Cognition in (outside of) a Nutshell
POLLING QUESTION:

HOW MANY OF YOU THINK (OR THOUGHT BEFORE READING THE PAPER) THAT COGNITION IS SOMETHING THAT HAPPENS INSIDE OF OUR BRAINS?
What came before cognitive science?
What came before cognitive science?

Behaviorism
What came before cognitive science?

Behaviorism

- Classical conditioning—think Pavlov’s dog
What came before cognitive science?

**Behaviorism**

- Classical conditioning—think Pavlov’s dog
- Focused on stimulus-response
What came before cognitive science?

Behaviorism

• Classical conditioning—think Pavlov’s dog
• Focused on stimulus-response
• John B. Watson and B. F. Skinner were major players in developing behaviorism and radical/neo-behaviorism (acknowledged internal processes)
• There are many flavors of behaviorism...
Stimulus -> Black Box -> Response
SO DOES THAT SETTLE THAT?
POLLING QUESTION:
How comfortable are you with behaviorism as the primary explanation for high-level human cognition?

A. Very
B. Somewhat
C. Not very
D. Not at all
SO DOES THAT SETTLE THAT?

THE COGNITIVE REVOLUTION!
Around the 1950s, a new kid on the block...
Around the 1950s, a new kid on the block...

Cognitivism
Around the 1950s, a new kid on the block...

Cognitivism

- An “all-out effort” to establish meaning-making as the central process of psychology
- Rejected “thinking” as a behavior, but rather its own object of study and theory
Around the 1950s, a new kid on the block...

Cognitivism

- An “all-out effort” to establish meaning-making as the central process of psychology
- Rejected “thinking” as a behavior, but rather its own object of study and theory
- **Uses computational models as the primary metaphor for describing cognition**
Cognitivism:
Some Major Players

George Miller         Noam Chomsky           Allen Newell
SO DOES THAT SETTLE THAT?
POLLING
How comfortable are you with equating what the human brain does, and the central seat of cognition, with a computer?

A. Very
B. Somewhat
C. Not very
D. Not at all
POSTCOGNITIVISM
A new new kid on the block...

**Postcognitivism**

- Rejects the notion that cognition is something that “just happens inside the brain”
- Posits that human cognition cannot be accurately or wholly described *without taking context, environment, embodiment, culture, and artifacts* into consideration.
Did you know...

- The founding meeting of the Cognitive Science Society was held at UCSD in 1979
- In 1986, the first Cognitive Science Department in the world was founded at UCSD
- This is a particularly special place to be studying Cog Sci!
Postcognitivism: Some Major Players

Don Norman           Edwin Hutchins           Jim Hollan
Some varying views on cognition...

- Behaviorism
- Cognitivism
- Post-cognitivism
Some varying views on cognition...

- Behaviorism
- Cognitivism
- Postcognitivism
Distributed Cognition...In The Wild

• Cognition in the Wild—Hutchin’s seminal work
• Conducted an ethnographic inquiry on a naval vessel
• Came out with a ton of data
• Analyzed said data and further developed DCOG
• Demonstrates effectiveness of Cognitive Ethnography
Insights about cognition 1

• You need a human brain to do human cognition

• Humans have bodies, language, artifacts, and live in complex built environments (not a vacuum)

• Mind and body interact in surprising and interesting ways
Insights about cognition 2

• A person interacting with an environment for thinking can do things that a person in isolation cannot

• Humans working together can do things that no person can do alone

• Humans are highly social and our cognition depends on the fact that we have language, and especially culture too
Where is the mind 1

- Is the mind in the brain?
- Is the computer a good model for the mind?
- A brain in a vat is a poor model for the human mind. Cognition is embodied!
Where is the mind 2

• The brain is a controller for body-world interaction

• Human life is lived in complex social environments that are filled with cultural artifacts

• Our cognition and our mindfulness emerge from the interactions of our brains and bodies with this socio-cultural world. It’s distributed!
DCOG fundamental premise: Cognition, in all its forms, emerges from the interactions among the elements of complex systems.

Cognitive Systems (units of analysis):
• a neural circuit composed of interacting neurons
• an area of the brain (e.g. V1 in visual cortex) composed of interacting neural circuits
• a whole brain composed of interacting areas
• a whole brain and a whole body in interaction
• brain-body-world in interaction
• a group of people in interaction with one another and with a shared setting
A hypothesis about cognition:

High-level human cognition depends on **interactions** with culturally organized material and social structures

Cognition is affected by or shaped by interactions with the material and social world: **Action can reveal underlying cognitive processes**

Some forms of human cognition are constituted in interactions of brain and body with the material and social world: **Action is a form of cognition**
Observing Earth through the...Cognito-scope!

Cognito-scope™ Edwin Hutchins
The Earth seen through the Cognito-scope
North America seen through the Cognito-scope
COGNITIVE ETHNOGRAPHY

The true mystery of the world is the visible, not the invisible.
- Oscar Wilde
What is Ethnography?

A suite of methods:

• The systematic study of the lifeworld of a community
• How the members of a community live, interact, communicate
• The material and ideational aspects of life

A product

• Documentation of a lifeworld
• An artifact that details your observations, inferences, and analyses
What is Cognitive Ethnography?

1. Accurate records of specific instances of real world human behavior
2. Analysis of the cognitive aspects of those instances
3. Use wider ethnography as a source of knowledge about what is being done, what resources are available for doing it, what conventions are used
Our BIG Problem

- Our minds are adapted to systematically NOT see many aspects of the organization of activity.
- This happens at all levels of organization.
- You think you are seeing the world you live in, but most of the interesting detail – most of the details that must be understood in order to understand cognition in this world - goes unnoticed.
Manifestations of the BIG Problem

• We consider our own daily lives to be **routine** and uninteresting so we do not attend to the details

• We **fill in gaps** in visual scenes, thereby failing to **see** the gaps. We rely on the world to provide consistency

• We **ignore** the **background** in scenes in order to better **see** the figure
More Manifestations of the BIG Problem

• We do not hear disfluencies in speech unless they are overwhelming
• If we are lucky, we remember the gist of what people say to us. We rarely remember the words they used to say it. When we are not so lucky, we remember what we expected or wanted someone to say, and not what they said at all
Still More Manifestations...

- We understand the world through cultural models that make some things obvious and make other things impossible to think. We almost never see the cultural models that structure our understandings.
- We effortlessly process multiple sources of information, yet we rarely attend to the relations among these sources.
WHAT CAN WE DO?

We need tools and techniques to overcome the many manifestations of the seeing-but-not-seeing problem...

WE NEED THE COGNITO-SCOPE!
Tuning the Cognitio-scope

• You must slow down.
  • Do not be in a hurry to understand
  • Set aside time to look and reflect
  • You cannot multitask the seeing of details in the world. Seeing in detail will take all of your attention

• You must be honest.
  • You will experience a temptation to fill in gaps in your observations. Resist it!
  • You must describe things as they are
  • Not as you expect them to be. Not as you think they normally occur. Not as you would like them to be
think small
When you have learned how to see your world, you will find that the smallest moment of human activity is loaded with interesting cognitive phenomena!
To overcome the tendency to take the world for granted...

• Pay attention to details
• Be methodical
• Plan your observations
• Keep a clear distinction between data and analysis
  • *Your data is what you actually recorded*
  • *Everything else is analysis or interpretation*
Cognitive Ethnography Methods

• Observations and field notes
• Freezing action with photographs
• Overcoming the fleeting nature of speech by recording and transcribing interviews
• Capturing the rich multimodal nature of interaction through the use of video recording
• The application of theoretical and conceptual knowledge to analyze your ethnographic data
All of these techniques are part of the Cognitive Ethnography Toolkit

• You will find many of them useful in your own research/class projects
• They provide excellent structure for doing qualitative research
• Most importantly, they are specifically geared towards...generating insight about the cognition all around us!
NOTHING NEVER HAPPENS