Cognitive Semantics

Gilles Fauconnier
1. Conceptualizing space

2. Fictive motion

3. Metaphor

4. Conceptual integration
From Virginia de Sa's talk:

Which is harder for us to do?

Program a computer to play chess at the grand master level

or

Program a computer to have vision as good as a two year old
Hidden behind *simple* words and *everyday* language are vast *conceptual networks* manipulated *unconsciously* through the activation of powerful neural circuits.
Importantly, thought and language are embodied. Conceptual structure arises from our sensorimotor experience and the neural structures that give rise to it.
Why do we have a brain?

- the purpose of the brain is to produce adaptable and complex movements

- movement is the only way we have
  - of interacting with the world
  - of communicating (speech, gestures, writing)

- sensory, memory and cognitive processes have evolved to guide movement

Trees do not need brains, because they do not have muscles.
Example 1

Over
The bird flew over the yard
The lamp is over the table
The lamp is on the table
Sam drove over the bridge
The board is over the hole
The post office is over the hill
He has freckles over most of his body.
I've hitchhiked over the entire country.

Ice spread all over the windshield.
There were flies all over the ceiling.
The spider crawled all over the ceiling.
Roll the log over

The fence fell over
1. There are dozens of schemas linked to the word *over*
2. The same is true of other spatial words: *in, out, up, above, through, across, ...*
3. Space is thus "carved up" conceptually in a way that's specific to a particular language (here English)
She has a strange power over me.

Schema 2
+
CONTROL IS UP metaphor

Sam was passed over for promotion.

Schema 1
+
CONTROL IS UP
+
CHOOSING IS TOUCHING
You've overlooked his accomplishments.

Schema 1.X.NC
+
SEEING IS TOUCHING
+
LOOKING AT IS TAKING INTO CONSIDERATION

Find someone who can oversee this operation.

Schema 2
+
CONTROL IS UP
+
SEEING for MAKING SURE (metonymy)
Look over my corrections.

Schema 3.MX.P
+
SEEING IS TOUCHING
+
LOOKING AT IS CONSIDERING
Harry hasn't gotten over his divorce.

Pete Rose is over the hill.

The rebels overthrew the government.

The play is over.
Example 2

Fictive motion
Coverage (co-extension) paths

The mountain range goes from Mexico to Canada.

The fence descends from the plateau to the valley.
Advent paths

The palm trees clustered together around the oasis.

This rock formation reappears near volcanoes.
Frame-relative motion

The scenery rushed past us.

A branch hit me.

The telephone pole was approaching fast.
Sensory paths

I can hear/smell him all the way from where he's standing.

We can be seen by the enemy from where we're standing. where they're positioned.
Wednesday’s meeting has been moved forward 2 days.

What day is it on?
Conceptual Metaphor

Source Domain

Target Domain
ACTIVITY IS A JOURNEY

example: LOVE IS A JOURNEY

Look how far we've come
We're at the crossroads
We'll just have to go our own separate ways
We can't turn back now
I don't think this relationship is going anywhere
We're stuck
It's been a long, bumpy road
We're just spinning our wheels
Our marriage is on the rocks
This relationship is foundering
Time As Unidimensional Space

Source Domain
Space

Target Domain
Time

front

behind

our place

future

past

present
Time Metaphors

- **Ego-Moving**
  - We’re approaching the end of the quarter.
  - We’re coming up on Christmas.

- **Time-Moving**
  - The end of the quarter is almost here.
  - Christmas is coming up.
Ambiguous Temporal Statement

Wednesday’s meeting has been moved forward 2 days. What day is it on?

- Ego-Moving
  - Friday
- Time-Moving
  - Monday
Do people use spatial concepts to think about time?

• If yes, thinking about space in a particular way should affect the way you think about time.

• If no, it shouldn’t.
Metaphoric Structuring

- Wednesday’s meeting has been moved forward 2 days. What day is the meeting on?
- Ego-Moving
  - 73.3% Friday
  - 26.7% Monday
- Object-Moving
  - 30.8% Friday
  - 69.2% Monday

(Boroditsky, 2000)
Imagined Motion

A You are sitting in the chair. While sitting in the chair, imagine how you would maneuver the chair to the X. Draw an arrow indicating the path of motion.

B You are holding a rope attached to the chair. With the rope, imagine how you would maneuver the chair to the X. Draw an arrow indicating the path of motion.

Imagine you are the person in the picture. Notice there is a chair on wheels, and a track.
Time Conception

• Next Wednesday’s meeting has been moved forward two days. What day is the meeting now that it has been rescheduled?

• Ego Moving
  – 43% Monday
  – 57% Friday

• Chair Moving
  – 67% Monday
  – 33% Friday

(Boroditsky & Ramscar, 2002)
Lunch Line

• Can your experience moving through space affect the way you think about time?

• Ask people waiting in lunch line the Wednesday meeting question

• People closest to the food have experienced the most motion and are more likely to adopt an ego-moving perspective
  – Does position in line affect the way the question is answered?
Airport

• Does experience of moving through space make you more likely to assume ego-moving perspective on time?
• Is actual experience of motion required, or does just thinking about it do it?
• Ask 3 groups Wednesday meeting question:
  – Just flown in
  – Waiting to depart
  – Waiting to pick someone up
Train

- For people in motion, does thinking about moving affect the way you understand statements about time?
- Ask 3 groups Wednesday meeting question:
  - Just got on train
  - Middle of journey
  - About to get off
abc $\emptyset$ abd

ijk $\emptyset$ ?
abc $\emptyset$ abd

ijk $\emptyset$ ij1
Successor Frame

Diagram:

- Nodes: a, b, c, i, j, k
- Connections: a → b, b → c, c → a, i → j, j → k, k → i
- Levels:
  - X1
  - X2
  - X3

The diagram represents a hierarchical structure with interconnected nodes at different levels.
\[ X_1 \]
\[ X_2 \]
\[ X_3 \]

\[ a \quad a \]
\[ b \quad b \]
\[ c \quad d = \text{succ}(b) \]

\[ i \]
\[ j \]
\[ k \]
\begin{align*}
x_1 & \quad \text{succ}(x_3) \\
x_2 & \quad x_2 \\
x_3 & \quad x_1
\end{align*}

*Rule*

replace last letter of successor sequence by its successor
<table>
<thead>
<tr>
<th>HEAT INPUT</th>
<th>EMOTION INPUT</th>
<th>BODY INPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;physical events&quot;</td>
<td>&quot;emotions&quot;</td>
<td>&quot;physiology&quot;</td>
</tr>
<tr>
<td>container</td>
<td>person</td>
<td>person</td>
</tr>
<tr>
<td>heat</td>
<td>anger</td>
<td>body heat</td>
</tr>
<tr>
<td>steam</td>
<td>sign of anger</td>
<td>perspiration, redness</td>
</tr>
<tr>
<td>explode</td>
<td>show extreme anger</td>
<td>acute shaking, loss of</td>
</tr>
<tr>
<td></td>
<td></td>
<td>physiological control</td>
</tr>
<tr>
<td>boiling point</td>
<td>highest degree</td>
<td></td>
</tr>
<tr>
<td></td>
<td>of emotion</td>
<td></td>
</tr>
</tbody>
</table>
I had reached the boiling point.

Let him stew.

Simmer down.
She got all steamed up.

Billy's just blowing off steam.

I was fuming.
He just exploded.

She blew up at me.

We're tired of your outbursts.
I blew my top.

He hit the ceiling.

She flipped her lid.

I went through the roof.
Smoke was pouring out of his ears.

He was on fire.