HG2002 Semantics and Pragmatics

Cognitive linguistics

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Lecture 11
Location:
https://bond-lab.github.io/Semantics-and-Pragmatics/

Overview

- Revision: Formal Semantics
  - Quantifiers and Higher Order Logic
  - Dynamic Approaches to Discourse
- Metaphor
- Metonymy
- Image Schemas
- Polysemy
- Mental Spaces
- Next and Final Lecture: Wrap-up and Revision
  No Tutorial Problems

Revision: Formal Semantics

Defining Relations using Logic

- **hyponymy**
  - $\forall x(\text{DOG}(x) \rightarrow \text{ANIMAL}(x))$
- **antonym**
  - $\forall x(\text{DEAD}(x) \rightarrow \neg\text{ALIVE}(x))$
  - $\forall x(\text{ALIVE}(x) \rightarrow \neg\text{DEAD}(x))$
- **converse**
  - $\forall x \forall y(\text{PARENT}(x,y) \rightarrow \text{CHILD}(y,x))$
- **synonym**
  - $\forall x((\text{EGGPLANT}(x) \rightarrow \text{BRINJAL}(x)) \wedge (\text{BRINJAL}(x) \rightarrow \text{EGGPLANT}(x)))$

Restricted Quantifiers

- *Most students read a book*
  - Most(x)(S(x) $\wedge$ R(x))
    most things are students and most things read books
  - Most(x)(S(x) iff R(x))
    most things, if they are students, read books
    but also true for all things that are not students!

- We need to restrict the quantification
  - (Most x: (S(x)) R(x)

- Sometimes we need to decompose
  - *everybody* ($\forall$x: (P(x))
  - *something* ($\exists$x: (T(x))

Generalized Quantifiers

- Q(A,B): *Q A are B*
- most(A,B) =1 iff $|\ A \cap B\ | > |\ A - B\ |$
- all(A,B) =1 iff $A \subseteq B$
- some(A,B) =1 iff $A \cap B \neq \emptyset$
- no(A,B) =1 iff $A \cap B = \emptyset$
- fewer than x(A,B,X) =1 iff $|\ A \cap B\ | < |\ X\ |$

Strong/Weak Quantifiers

(1) only **weak** quantifiers can occur in existential *there* sentences

a. *There is a fox in the henhouse*

b. *There are two foxes in the henhouse*

c. **There is every fox in the henhouse*

d. **There are both foxes in the henhouse*

➢ **symmetrical** (cardinal) quantifiers are **weak**
det(A,B) = det(B,A)

(2) *three lecturers are Australian* = *three Australians are lecturers*

Negative Polarity Items

- Some words in English appear only in downward entailing expressions
  - **Upward entailment** goes from a subset to a set
  - **Downward entailment** goes from a set to a subset

(3) a. *Kim doesn't eat dessert* $\Rightarrow$ *Kim doesn't eat hot dessert*

b. *Kim doesn't eat hot dessert* $\not\Rightarrow$ *Kim doesn't eat dessert*

Downward entailment

(4) a. *Kim eats some desserts* $\not\Rightarrow$ *Kim eats hot dessert*

b. *Kim eats some hot dessert* $\Rightarrow$ *Kim eats some desserts*

Upward entailment

- Negative Polarity Items are licensed by downward entailing expressions

Left and Right Monotonicity

- The monotonicity may depend on the position

(5) a. *Every student studies semantics* $\not\Rightarrow$ *Every student studies formal semantics*

b. *Every student studies formal semantics* $\Rightarrow$ *Every student studies semantics*

Upward entailment (right argument)

(6) a. *Every student studies semantics* $\Rightarrow$ *Every linguistics student studies semantics*

b. *Every linguistic student studies semantics* $\not\Rightarrow$ *Every student studies semantics*

Downward entailment (left argument)

(7) a. *Every student who has ever studied semantics loves it*

b. **Every student who has studied semantics ever loves it*

c. *Few students who have ever studied semantics dislike it*

d. *Few students who have studied semantics ever dislike it*

➢ Formal models of quantification can be used to make predictions about seemingly unrelated phenomena

Modality as a scale of Implicatures

(8) *I know that* p

(9) *I am absolutely certain that* p

(10) *I am almost certain that* p

(11) *I believe that* p

(12) *I am pretty certain that* p

. . .

(13) *Possibly* p

. . .

(14) *It is very unlikely that* p

(15) *It is almost impossible that* p

(16) *It is impossible that* p

(17) *It is not the case that* p

(18) *I am absolutely certain that not-*p

Modal Logics

- Add modal operators
  - Epistemic
    - $\Diamond\,\phi =$ *it is possible that* ϕ
    - $\Box\,\phi =$ *it is necessary that* ϕ
  - Deontic
    - $\mathrm{P}\,\phi =$ *it is permitted that* ϕ
    - $\mathrm{O}\,\phi =$ *it is obligatorily* ϕ

- Define them in terms of **possible worlds**
  - $\Diamond\,\phi$: true in at least one world
  - $\Box\,\phi$: true in all worlds
  - $\mathrm{P}\,\phi$: true in at least one legal or morally ideal world
  - $\mathrm{O}\,\phi$: true in all legal or morally ideal worlds

Cognitive Semantics

Introduction

- Cognitive linguistics sees language as embedded in its use
  - a **functional** approach to language
  - considering **diachronic** and not just **synchronic** evidence
  - little or no separation between syntax, semantics and pragmatics

- The basic idea is that one thing is characterized in terms of another
  - **Metaphor** and **figurative** language
  - **Image Schemas**
  - **Mental Spaces**

Figurative language use

(19) *Our new boss is a dinosaur*

(20) *She fought for her life [in hospital]*

(21) *His mind was racing*

(22) *The ham skated across the kitchen floor*

(23) *The brandy tobogganed down his throat*

Metaphors and Mechanisms of Interpretation

A metaphor is an extension of the use of a word beyond its primary meaning to describe referents that bear similarities to the word's primary referent.

- ***eye*** "body part used for vision"

  (24) *dull end of a needle (with a hole for the thread)*
  (25) *the bud on a potato*
  (26) *the centre of a storm*

- The similarities between these referents and the primary referent of the word ***eye*** are:
  - roundish shape
  - more or less central location on a larger shape

Grammaticalization

- Once a metaphor becomes accepted, speakers tend to view the metaphorical meaning as separated from its primary meaning

  (27) *booking a flight*
  (28) *tabling a motion*
  (29) *seeing the point*
  (30) *stealing the headlines*
  (31) *buying time*

- These are **dead** or **frozen metaphors**: we don't need to specially process them

- We would expect to find them in a lexicon like wordnet

Metaphors as non-prototypical use

- In a way, metaphors are non-prototypical uses of a word.
  - Humans understand words by referring to a prototypical usage, and they match a new example against the characteristics of the prototype.
  - Use of words with broken typicality conditions happens all the time.

- (32) *The price of brussel sprouts went up.*
  (33) *Marigold is coming out of a coma.*
  (34) *Felix is under age.*
  (35) *I killed his argument.*
  (36) *Their love affair is blossoming.*
  (37) *She has a fertile imagination.*

- Depending on how you count frozen metaphors, we use metaphors more than literal uses

Metaphors as central to understanding

Our conceptual system is fundamentally metaphorical in nature

George Lakoff

- Cognitive semantics:
  There is no separation between cognition and linguistic knowledge

- Features of Metaphor
  - **Conventional** some metaphors are very well established (but remain metaphorical)
  - **Systematic** understood as part of larger domains
  - **Asymmetrical** normally understand the abstract in terms of the concrete

Metaphors we live by

- Metaphor is pervasive in everyday life, not just in language but in thought and action.

- Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature.

- If we are right in suggesting that our conceptual system is largely metaphorical, then the way we think, what we experience, and what we do every day is very much a matter of metaphor.

  George Lakoff and Mark Johnson 1980 *Metaphors we live by* University of Chicago Press.

Prototypical metaphors

Some metaphors are not as good as others because not all broken typicality conditions result in prototypical metaphors. What is a prototypical metaphor?

- Similarity and dissimilarity have both been stressed.
- Items must not be too similar:

(38) #*Wine is whisky*
(39) #*Cars are trucks*
(40) #*Jam is honey*

- They should not be too dissimilar:

  (41) *His feet were stars*
  (42) *Her cheeks were typewriters*
  (43) *Her knees were penguins*

- In a prototypical metaphor then, items compared are likely to come from different lexical fields but they are also similar in that they do share some minor characteristic. Dissimilarity signals the listener to do some active semantic matching.

  (44) *Life is a subway train*
  (45) *Men are thistles*
  (46) *He posted the toast down to his stomach*

Target and Source Domains

Metaphors enable us to understand one domain of experience in terms of another.

Lakoff and Turner (1989)

- We map from a **source domain** to a **target domain**

  often written: **TARGET** is **SOURCE**

ARGUMENT is WAR

(47) *Your claims are indefensible.*
(48) *He attacked every weak point in my argument.*
(49) *His criticisms were right on target.*
(50) *I demolished his argument.*
(51) *I've never won an argument with him.*
(52) *You disagree? Okay shoot!*
(53) *If you use that strategy, he'll wipe you out.*
(54) *He shot down all my arguments.*
(55) *He was defeated by the argument.*

- We don't just talk about argument in terms of war. We can actually win or lose arguments.

- Many of the things we do in arguing are partially structured by the concept of war. Though there is no physical battle, there is a verbal battle.
  - We see the person we are arguing with as an opponent.
  - We attack their positions and defend our own.
  - We gain and lose ground.
  - We plan and use strategies.

- The metaphor is not only in the words we use — it is in our very concept of argument. We talk about arguments that way because we conceive of them that way — and we act according to the way we conceive of things

- But we could think of an argument as a search for truth, …

Argument: When losing is winning

- Leo Kent (2013) argues that the argument as war metaphor is counterproductive
  - Suppose you and I have an argument. You believe a proposition, P, and I don't. I've objected, I've questioned, I've raised all sorts of counter-considerations, and in every case you've responded to my satisfaction. At the end of the day, I say, 'You know what? I guess you're right.'
  - So I have a new belief. And it's not just any belief, but it's a well-articulated, examined and battle-tested belief.
  - So who won that argument? Well, the war metaphor seems to force us into saying you won, even though I'm the only one who made any cognitive gain.
  - The war metaphor forces us into thinking that you're the winner and I lost, even though I gained and there's something wrong with that picture.

Spatial Metaphors

- **Spatial metaphors** have to do with spatial orientation: ***up-down, in-out, front-back, on-off, deep-shallow, central-peripheral***.

- Spatial metaphors give a concept a spatial orientation eg. HAPPY is UP: *I'm feeling up today*

- Though polar oppositions *up-down, in-out* are physical in nature, the spatial metaphors based on them can vary from culture to culture. (e.g. in most cultures FUTURE is FRONT but in at least one FUTURE is BACK)

  - Aymara, who live in the Andes highlands of Bolivia, Peru and Chile, have future behind them

HAPPY is UP

(56) *I'm feeling up.*
(57) *That boosted my spirits.*
(58) *My spirits rose.*
(59) *You're in high spirits.*
(60) *Thinking about logic gives me a lift.*
(61) *I'm feeling down.*
(62) *I'm depressed.*
(63) *He is really low these days.*
(64) *I fell into a depression.*
(65) *My spirits sank.*

HEALTHY is UP

(66) *He's at the peak of health.*
(67) *Lazarus rose from the dead.*
(68) *He's in top shape.*
(69) *She fell ill.*
(70) *He is sinking fast.*
(71) *She came down with the flu.*
(72) *Her health is declining.*
(73) *He dropped dead.*

CONTROL is UP

(74) *I have control over them.*
(75) *I am on top of the situation.*
(76) *He's at the height of this power.*
(77) *She's in high command.*
(78) *He's in the upper echelon.*
(79) *Her power rose.*
(80) *He ranks above me in strength.*
(81) *She is under my control.*
(82) *He fell from power.*
(83) *Her power is on the decline.*

AWAKE is UP

(84) *Get up.*
(85) *Wake up.*
(86) *I'm up already.*
(87) *He rises early in the morning.*
(88) *She fell asleep.*
(89) *He dropped off to sleep.*
(90) *Sje's under hypnosis.*
(91) *He sank into a coma.*

VIRTUE is UP

(92) *He is high-minded.*
(93) *She is upright.*
(94) *She is a upstanding citizen.*
(95) *He is underhanded.*
(96) *I wouldn't stoop to that.*
(97) *That is beneath me.*
(98) *That was a low trick.*

MORE is UP

(99) *The number of books printed keeps going up.*
(100) *The number of errors he made is incredibly low.*
(101) *What is the upper bound?*

- Our experience of physical objects and substances provides a further basis for understanding.

- UP is positive
  - if we pile things up, more reach higher
  - healthy people stand upright
  - when we are awake, we stand up

- Understanding our experiences in terms of objects and substances allows us to pick out parts of our experience and treat them as discrete entities.

MENTAL HEALTH is a (FRAGILE) OBJECT

(102) *Her mental health is very fragile.*
(103) *We have to handle him with care since his wife's death.*
(104) *He broke under cross-examination.*
(105) *She is easily crushed.*
(106) *The experience shattered him.*
(107) *I'm going to pieces.*
(108) *His mind snapped.*
(109) *He cracked up.*

MIND is a MACHINE

(110) *We're still trying to grind out the solution to this equation.*

(111) *My mind just isn't operating today.*

(112) *Boy, the wheels are turning now!*

(113) *I'm a little rusty today.*

(114) *We've been working on this problem all day and now we're running out of steam.*

(115) *He broke down.*

LIFE is a JOURNEY

- The person leading a life is a traveler
- Their purposes are destinations
- The means for achieving purposes are routes
- Difficulties in life are impediments to travel
- Counsellors are guides
- Progress is the distance traveled
- Things you gauge your progress by are landmarks
- Material resources and talents are provisions.

ANGER

- Emotions are often considered to be feelings alone, and as such they are viewed as being devoid of conceptual content.
- In fact emotions have a fairly complex conceptual structure which can be studied through metaphors.
- Lakoff and Johnson's cultural model of anger
  Physiological effects of anger:
  - Increased body heat
  - Increased internal pressure
  - Agitation
  - Interference with accurate perception
  - As anger increases, the physiological effect increases
  - There is a limit beyond which the physiological effects of anger impair normal functioning.

- Body heat:

  (116) *Don't get hot under the collar.*
  (117) *Billy's a hothead.*
  (118) *They were having a heated argument.*
  (119) *She got all hot and bothered.*

- Internal pressure:

  (120) *When I found out, I almost burst a blood vessel.*
  (121) *He almost had a hemorrhage.*
  (122) *I exploded at them.*

- Redness in the face and neck area:

  (123) *She was scarlet with rage.*
  (124) *He got red with anger.*
  (125) *He was flushed with anger.*

- Agitation

  (126) *She was shaking with anger.*
  (127) *I was hopping mad.*
  (128) *He was quivering with rage.*
  (129) *He's all worked up.*
  (130) *She's all wrought up.*

- Interference with accurate perception

(131) *She was blind with rage.*

(132) *I was beginning to see red.*

(133) *I was so mad I couldn't see straight.*

ANGER is HEAT

- ANGER is HEAT forms the basis of the most general metaphors for anger
- There are two versions to this metaphor, one where the heat is applied to fluid and the other where the heat is applied to solids.
- The fluid version is more elaborated
- The body is a container for the emotions

(134) *He was filled with anger.*
(135) *She couldn't contain her joy.*
(136) *She was brimming with rage.*
(137) *Try to get the anger out of your system.*

- The ANGER is HEAT metaphor when applied to fluids combines with the metaphor the body is a container for the emotions to yield the central metaphor of the system:

- ANGER is HEAT OF A FLUID in a container.

  (138) *You make my blood boil.*
  (139) *Simmer down!*
  (140) *I had reached the boiling point.*
  (141) *Let him stew.*
  (142) *She was seething with rage.*

- Similarly ***pissed off*** is used only to refer to anger — “hot liquid under pressure”

- Cool and calm corresponds to the lack of anger.

(143) *Keep cool.*

(144) *Stay calm.*

➢ When The Intensity Of Anger Increases The Fluid Rises

(145) *His pent-up anger welled up inside him.*

(146) *She could feel her gorge rising.*

(147) *We got a rise out of him.*

(148) *My anger kept building up inside me.*

(149) *Pretty soon I was in a towering rage.*

- We also know that intense heat produces steam and creates pressure on the container. This yields the metaphorical entailments:

- Intense Anger Produces Pressure On The Container

(150) *He was bursting with anger.*
(151) *I could barely contain my rage.*
(152) *I could barely keep it in any more.*
(153) *He suppressed his anger.*
(154) *They turned their anger inward.*
(155) *He managed to keep his anger bottled up inside him.*

- When the pressure on the container becomes too high, the container explodes.

- When Anger Becomes Too Intense The Person Explodes

(156) *When I told him, he just exploded.*
(157) *She blew up at me.*
(158) *We don't like your outbursts.*
(159) *She blew a fuse.*
(160) *He blew a gasket.*
(161) *He erupted.*

➢ When A Person Explodes, Parts Of Them Go Up In The Air.

(162) *I blew my stack.*

(163) *I blew my top.*

(164) *She flipped her lid.*

(165) *He hit the ceiling.*

(166) *I went through the roof.*

- The central metaphor of Anger as heated fluid in a container indicate that the anger scale is not open-ended, it has a limit. Just as hot fluid in a closed container can only take so much heat before it explodes, so we conceptualise the anger scale as having a limit point. We can only bear so much anger before we explode.

- The conceptual metaphors are motivated by our physiology

- There may be cross-cultural differences

- And there are many possible metaphors
  - ANGER is FIRE
  - ANGER is INSANITY
  - ANGER is an OPPONENT
  - ANGER is a DANGEROUS ANIMAL

Influence of Metaphors

- Verbs of perception

seeing	$\rightarrow$	understanding
hearing	$\rightarrow$	obeying
tasting	$\rightarrow$	choosing
feeling	$\rightarrow$	emoting
smelling	$\rightarrow$	disliking

- Literal meanings extend into metaphorical meanings
- These become conventionalized
- And then we have polysemy

Metonymy as Metaphor

- PART for WHOLE (synecdoche)

  (167) *Can you lend a hand?*

- WHOLE for PART (synecdoche)

  (168) *NTU won the soccer.*

- CONTAINER for CONTENT

  (169) *The lunch menu had five dishes.*

- MATERIAL for OBJECT

  (170) *I won gold.*

- PRODUCER for PRODUCT

(171) *I'll get an IBM*

- PLACE for INSTITUTION (toponym)

  (172) *Downing Street has made no comment*

- INSTITUTION for PEOPLE RESPONSIBLE

  (173) *Fairprice raised its prices.*

- PLACE for EVENT

  (174) *Hiroshima changed our view of war.*

- CONTROLLER for CONTROLLED

  (175) *A truck rear ended me.*

➢ OBJECT for USER

(176) *They are a hired gun.*

Everything's a metaphor

- Embodied Construction Grammar
  - **embodied** ECG structures parameterize active simulations based on motor and perceptual schemas
  - **construction-based** the basic linguistic unit is a construction, or form-meaning pairing
  - **constraint-based** constraints of all kinds (phonological, syntactic, semantic, etc.) are expressed using a unification-based grammar;
  - **formal(ized)** both formally defined and computationally implemented.

- We understand ***grasp*** because we can physically control our bodies to grasp things.

- We grasp ***understand*** because it is like ***grasp*** but with ideas not things.

Metaphor and Politics

- Lakoff (1995) states that different political groups base their understanding of the world on different metaphors
  - **nurturant parent** (liberal) family is one that revolves around every family member caring for and being cared for by every other family member, with open communication between all parties, and with each family member pursuing their own vision of happiness.
  - **strict father** (conservative) family revolves around the idea that parents teach their children how to be self-reliant and self-disciplined through ”tough love”.

Nurturant Parent

- Morality: The basis of morality is in understanding, respecting, and helping other people, and in seeking the happiness of one's self and of others. The primary vices are selfishness and anti-social behavior.

- Child development: Children develop morality primarily through interacting with and observing good people, especially good parents. Punishment is necessary in some cases, but also has the potential to backfire, causing children to adopt more violent or more anti-social ways. Though children should, in general, obey their parents, they will develop best if allowed to question their parents' decisions. Moral development is a life-long process, and almost no one is so perfect as not to need improvement.

- Justice: The world is not without justice, but it is far from the

ideal of justice. Many people, for example, do not seem properly rewarded for their hard work and dedication. We must work hard to improve everyone's condition.

Strict Father

- Morality: Evil is all around us, constantly tempting us. Thus, the basis of morality is strong moral character, which requires self-reliance and self-discipline. The primary vices are those that dissolve self-discipline, such as laziness, gluttony, and indulgent sexuality.

- Child development: Children develop self-discipline, self-reliance, and other virtues primarily through rewards and punishment, a system of ”tough love”. Since parents know the difference between right and wrong and children still do not, obedience to the parents is very important. Moral development basically lasts only as long as childhood; it’s important to get it right the first time, because there is no ”second chance”.

- Justice: The world may be a difficult place to live, but it is basically just; people usually get what they deserve. The difficulties

in one's life serve as a test to sort the deserving from the undeserving.

Image Schemas

Image schemas

- Claimed to be the fundamental organising principle of metaphors
  - Containment schema
  - Path schema
  - Force schema
  - Up-down
  - Left-right
  - Part-whole
  - Center-periphery

Polysemy and Prototypes: *over*

(177) *The plane is flying over the hill.*
(178) *Sam walked over the hill.*
(179) *The bird flew over the yard.*
(180) *The bird flew over the wall.*
(181) *Sam lives over the hill.*
(182) *The painting is over the mantel.*
(183) *The board is over the hole.*
(184) *Kim spread the tablecloth over the table.*
(185) *The city clouded over.*
(186) *The guards were posted all over the hill.*
(187) *Kim still hasn't gotten over their disappointments.*

Something is vertically above something else: can be path, point or space

Mental Spaces

Mental Spaces

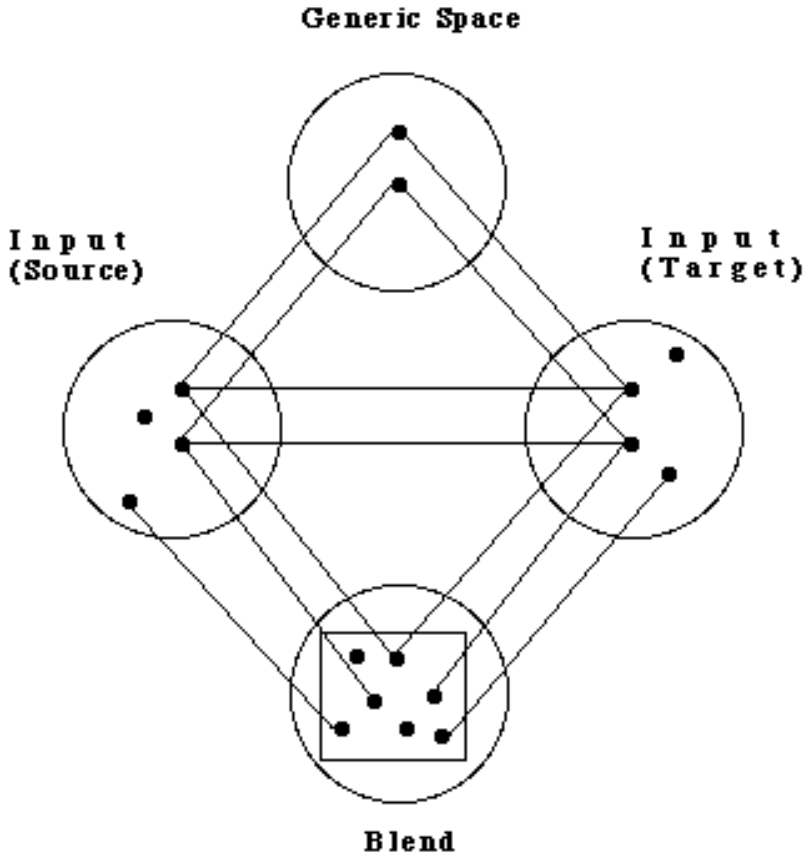
- **Mental Spaces** are very like Possible Worlds
  - However, mental spaces do not contain a faithful representation of reality, but an idealized cognitive model.
- We typically build multiple Mental Spaces

  (188) *In the film, Michelle is a Witch.*

  Michelle can be in the real world mental space, or the film mental space
- **Conceptual Blending**
  - Like Metaphors for Mental Spaces

  (189) *If Clinton had been the Titanic, the iceberg would have sunk.*

Conceptual Blending



Acknowledgments and References

- Video from Monty Python's *Life of Brian*
  Sermon on the Mount

- Some slides use material from Ng Bee Chin

- Many metaphors on-line at the Conceptual Metaphor Home Page:
  `http://cogsci.berkeley.edu/lakoff/metaphors/`

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