

## A Lexical Semanticist's Apology<sup>1</sup>

### 1 Lexical Semantics

- Words carve up the world around us into sometimes very fine-grained distinctions. Lexical semantics is the study of word meaning, focused on developing a theory of how a lexicon is organized and how word meanings connect to other parts of language and cognition:
  - What is a word meaning? Is it something atomic, or something more decomposable?
  - If the latter, what subcomponents of word meaning matter in some way? And how do they fit together into larger meanings?
  - Are there limits on word meanings? Possible vs. impossible words?
  - How do word meanings relate to grammar, what do they tell us about how we perceive the world, and how do they shape or are they shaped by deeper cognitive principles?
- A typical methodology for lexical semantic research can go up or down the following:
  - Identify a semantically coherent set of words
  - Identify some correlating property that you think is interesting or robust:
    - \* Grammatical contexts they can (not) appear in
    - \* Interpretations they may (not) have and inferences they (do not) give rise to
    - \* Distributional collocations across a discourse or larger corpus
    - \* Corresponding non-linguistic behaviors
  - Identify aspects of word meaning implicated in the behavior, deduce relevant principles linking the two, and integrate the significance of those results into a larger theory.
- Sometimes, we look across languages for further (and more general) constraints on variation of the same or functionally equivalent word behavior and/or semantics.
- Theoretical lexical semantics cross-cuts other areas of linguistics (e.g. syntax, morphology, formal semantics, cognitive science, psycholinguistics, computational linguistics).
- As a linguistic theorist, I am interested in how words figure into grammar and what this tells us about word meanings and about grammar. Fillmore (1970) — in a classic case study on lexical semantics — expresses this research program clearly:

“...a linguist's analysis of words cannot be accounted satisfactory until his observations can be incorporated into a general empirical theory of linguistic structure. In other words, we cannot be satisfied that our inquiry has been completed until we are convinced that the concepts and principles we have used in organizing our observations are proper to some substantively and formally specific explanatory theory of the nature of human language. What this means in practice is that the linguist keeps the connection with empirical linguistic theory in mind, at least, whereas the philosopher traditionally has not been expected to do so.” (*ibid*:121)

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<sup>1</sup>With further apologies to G. H. Hardy (1967).

- Studying the grammatical correlates of word meaning means looking at the following areas:
  - Argument selection — how words require other phrases to complete their meaning.
  - Modification — how optional phrases add extra meaning to words.
  - Morphology — how prefixes and suffixes alter a word’s meaning (or grammar).
  - Parts of speech — how things like noun and verb correspond to (or arise) from meaning.
- In this I follow Ivan Sag and Head-driven Phrase Structure Grammar (Pollard and Sag 1994, Ginzburg and Sag 2000, Sag et al. 2003), which put words at the center stage of syntax.
- In HPSG words came with rich information about their grammatical properties, were organized into hierarchies of shared information, and could build off each other’s information.
- Much of this was represented as a part of the word’s formal definition, in the same part of its “dictionary entry” as its part of speech or phonology. Yet it was connected to meaning.
- As my work evolved I began to dig deeper into the semantics itself — the other half of a word’s “dictionary entry” — to see how far we can get if we tie grammatical properties *directly* to its meaning, qua truth conditions (about the world or conceptions of the world).
- This meant paying attention to the acceptability and interpretation of words in context, and inferences that arise from specific words, borrowing tools of “formal” semantics. This adds a lot to the story of how word meaning and grammar are related, while raising more questions.
- Today, I will outline why lexical semantics is an interesting field and outline my take on its goals with a few telling examples, taking Fillmore’s classic study as a launching point.
- In the following two lectures I’ll explore in more depth some larger theoretical issues in the study of word meaning, drawing on my own work and the work of others.

## 2 The Need for a Richer Theory of Verb Meaning: A Case Study in Two Verbs

- Perhaps the simplest — and most compositionally useful — theory of a verb’s meaning is that it is a **function** that takes **arguments**, linguistically represented by noun phrases (NPs) and other phrases, and returns a truth value, like a logical or mathematical function:

$$(1) \quad \llbracket break \rrbracket = \lambda x \lambda y [break'(y, x)] \quad (\text{cp. } f(x, y) = (y * x)^2)$$

“The denotation of *break* is a function that takes individual *x* and outputs a function that takes individual *y* and outputs True iff *y* broke *x*.”

#1 The order of arguments in (1) correctly ensures that *x* is the direct object and *y* the subject:

$$(2) \quad [_S \text{ Dexter } [_{VP} \text{ broke the vase } ]]. \quad (\textit{What Dexter did was } [ \textit{break the vase } ])$$

#2 This theory predicts at least some facts about what arguments the word requires and how:

- (3) a. *Intransitive verbs take just one argument:*  
Mary slept (\*the dog).  $\lambda x [sleep'(x)]$
- b. *Transitive verbs take two arguments:*  
The doctor made \*(an incision).  $\lambda x \lambda y [make'(y, x)]$
- c. *Ditransitive verbs take three arguments:*  
Jo gave \*(me) \*(books).  $\lambda x \lambda y \lambda z [give'(z, y, x)]$

#3 It also predicts that (2) will never have the (weird) meaning “The vase broke Dexter” — the order of composition forces the patient to be the object and thus the thing broken.

- However, the above facts are not exhaustive of the linguistically significant aspects of verb meaning. There are many additional facts which require a deeper explanation.

#1 In most languages, with verbs meaning “break” the subject is always the breaker and the object the thing broken, i.e. (4) is rarely attested (save perhaps in some ergative languages or some Western Austronesian languages; Dixon 1994, Arka 2003).

(4)  $[[break]] = \lambda y \lambda x [break'(y, x)]$  (rarely, if ever, attested)

#2 There is also *variation* in how arguments are realized, but usually with consistency. I illustrate this via the study of Fillmore (1970) on *hit* and *break*, which seem to pick out one event type (focusing solely on their “basic” meaning and ignoring any metaphorical extensions).

(5) Some participant acts forcibly on some other participant.

- Obviously, they are not literally identical in meaning; each has its own idiosyncrasies (see Majid et al. 2007 and papers in that volume for a cross-linguistic study of this question). Here’s what the Oxford English Dictionary has to say about their main meanings:

(6) a. *break*: I. To sever into distinct parts by sudden application of force, to part by violence. II. With regard chiefly to the state or condition produced: to break so as to disable, destroy cohesion, solidity, or firmness, crush, shatter. (OED)

b. *hit*: I. To reach or get at with a blow or a missile; to give a blow to (something aimed at); to strike with aim or intent. (OED)

- These definitions touch on our real world knowledge of what we classify as “breaking” and “hitting” events (though I’m not sure I agree on *break*). But do these differences in meaning actually make any linguistic difference? And if so, which bits of these meanings?
- The grammatical behavior of these words indicates they are not interchangeable. Fillmore identifies at least three uses of *break* and two of *hit* through their grammatical behavior:

(7) a. Mary broke the window (with the hammer).

b. The hammer broke the window.

c. The window broke.

(8) a. Mary hit the window (with the hammer).

b. The hammer hit the window.

c. \*The window hit.

- The intransitive forms are “inchoative”. This differs from the passive in that (a) there is no overt morphology (in English) and (b) there is not necessarily a causer.

(9) a. The window broke all by itself. (i.e. without someone breaking it)

b. #The window **was/got broken** all by itself. (i.e. without someone breaking it)

- Thus the primary difference is that *break* occurs in the inchoative and *hit* does not. We could stop here and assume that *break* is three-ways polysemous, and *hit* two-ways.

- But Fillmore suggests that there are basic semantic components that link these readings together, some shared between *break* and *hit*, and some idiosyncratic to each.
- He analyzed this via an **argument structure** — a list of arguments the verb wants to be surrounded by — built on a theory of **thematic roles** — descriptions of what each argument does in the event, drawn from a supposedly universal set that languages care about (drawing on Fillmore 1968, 1970, Jackendoff 1972; see Levin and Rappaport Hovav 2005: Ch.2):

- (10)
- Agent - The doer of an action or causer/initiator of an event
  - Patient/theme - An entity that changes, moves, comes into/goes out of existence, or is located in the event
  - Instrument - An entity that an agent uses during the event
  - Place/location - Where something is located
  - Source - Where something moves from
  - Goal - Where something moves to
  - Recipient - An entity that receives something during an event
  - Experiencer - An entity that experiences a psychological event
  - Stimulus - An entity that triggers a psychological event in some other entity

- Fillmore suggests that just one argument structure per verb accounts for the data:

- (11)
- break*: (agent) (instrument) patient
  - hit*: (agent)(instrument) place

- The parentheses indicate an element that is not required, while the joined parentheses indicates that one or the other entity must be realized (but not necessarily both).

#1 Why patient vs. place? With *break* the patient must be affected in some way, while with *hit* it does not. This can be diagnosed by thinking about the meaning and the possible contexts the word may occur in, a very important methodology I will return to repeatedly:

- (12)
- #I broke the window with the hammer; it didn't faze the window but the hammer shattered.
  - I hit the window with the hammer; it didn't faze the window but the hammer shattered.

- The patient of *break* behaves more like a monolithic object grammatically, while the place of *hit* behaves more like a location:

- (13)
- Sandy hit the bandit's arm.
  - Sandy hit the bandit *on the arm*.
  - I broke the bandit's arm.
  - \*I broke the bandit *on his arm*.

#2 But what explains the different argument realization patterns? Thematic roles can provide the basis for **linking rules** — principles relating semantics to syntax (e.g. Fillmore 1968).

- (14) a. If the verb has an agent argument, it is the subject, else if the verb has an instrument argument, it is the subject, else if the verb has a patient/place argument, it is the subject (i.e. agent > instrument > patient/place for subjecthood)  
 b. If the verb has a patient/place argument that is not the subject, it is the object.  
 c. Anything not the subject or object is a prepositional phrase (PP)

- These can be viewed as online rules of linking meaning to syntax (e.g. converting a set to a function), *or* as facts about how humans lexicalize meaning (as per Dowty 1991). Either way, only denotations of type (15a) are possible, not (15b), ruling out the unattested form:

- (15) a.  $\llbracket break \rrbracket = \lambda x \lambda y [break'(y, x)]$  (y=agent, x=patient)  
 b.  $*\llbracket break \rrbracket = \lambda y \lambda x [break'(y, x)]$  (y=agent, x=patient)

- Now, a key fact of this approach is that participants are **ranked** for subjecthood. That ranking thus defines a kind of lexical semantic hierarchy or structure that grammar cares about.
- ∴ Word meanings are decompose into shared semantic pieces, which are structured relative to each other. Rules mapping meaning to grammar are sensitive to the pieces and the structure.

Grammatically relevant lexical meaning is not just decomposed but **structured**.

- If you're curious, more recent work has taken this further. Agent and instrument are two types of *causers* (Croft 1990, 1998, Jerro 2017a; see also Rissman and Rawlins 2017). Maybe *break* has an optional causer, *hit* an obligatory one:

- (16) a. *break*: (causer) patient  
 b. *hit*: causer place

- Levin and Rappaport Hovav (1995), Reinhart (2002), Chierchia (2004), and Koontz-Garboden (2009) go further: causers can only be eliminated if they are not associated with extra entailments. *Hit* requires blunt contact, while *break* requires really nothing other than causation:

- (17) a. Sandy hit the vase #by pushing it onto the floor/singing shrilly.  
 b. Sandy broke the vase by pushing it onto the floor/singing shrilly.

- Thus we might be able to explain the differences with even greater level of generality:

- (18) a. *break*: causer patient  
 b. *hit*: causer place (plus a causer elimination rule)

- The upshot is that we need not posit tons of separate lexical entries, nor word-specific rules.
- These generalizations wouldn't be possible had we not dug inside word meanings. Just posit-ing *break'* as in (15) isn't enough — what's "inside" *break'* matters as well!
- This was of course just an illustration using a specific theory of word meanings (thematic roles) on just two words. If it was just these two words, we probably spent a lot of time overtheorizing. But the larger point goes far beyond just that.

### 3 From Two Verbs to Whole Verb Classes: Regularity and Idiosyncrasy in Verb Meaning

- For every verb that behaves some way you'll probably find several that behave just like it.
  - (19)
    - a. John shattered/cracked/bent the metal lid (with the hammer).
    - b. The hammer shattered/cracked/bent the metal lid.
    - c. The metal lid shattered/cracked/bent.
  - (20)
    - a. John struck/bumped/knocked the window (with the hammer).
    - b. The hammer struck/bumped/knocked the window.
    - c. \*The window struck/bumped/knocked.
- Thus we have really identified two verb *classes*, **change-of-state** and **surface contact**, distinguished by thematic roles (the grammatically relevant components of lexical meaning). (Just FYI, but Levin 1993 is an excellent resource on grammatically significant verb classes.)
- But what distinguishes words *within a class*? They are not interchangeable, so there must be some meaning that distinguishes them (Dowty 1979, Levin and Rappaport Hovav 1995, 1998, Pesetsky 1995, Grimshaw 2005, Beavers and Koontz-Garboden 2020, *inter alia*).

(21)	<b>Template</b> (e.g. a thematic role list)	<b>Root</b>
	a. causer patient	BREAK
	b. causer patient	CRACK
	c. causer patient	SHATTER

- The root affects interpretation and rules out unacceptable sentences even in cases where the grammar is otherwise entirely “correct” according to the template.
  - (22)
    - a. #Kim broke the soup. (structural integrity of patient)
    - b. #Kim hit the mirage. (rigid physical extent of place)
- Fillmore has a cute trick for determining this — based on the hearing following, what sort of thing do you think a *twarge* is?
  - (23)
    - a. Maxine broke the twarge.
    - b. Maxine folded the twarge.
    - c. Maxine shattered the twarge.
  - (24)
    - a. Maxine hit the twarge.
    - b. Maxine slapped the twarge.
    - c. Maxine knock the twarge.
- So there's two “halves” of a word's meaning. There's some sense in the field that these sorts of semantic distinctions are very lexicographic, and not likely to matter grammatically (as suggested by Fillmore 1970: 129 and Dowty 1979: 32).
- Well, Beavers and Koontz-Garboden (2020) and Beavers et al. (2021) beg to differ! This question will be the topic of my third talk. But let me say a few words here that point to that.

#1 Roots themselves cluster into subtypes (Rappaport Hovav and Levin 1998):

- (25) a. States (what happens to the patient): *break, crack, shatter, open, fold*  
 b. Place (where theme ends up): *shelve, table, file, box, pocket, bottle*  
 c. Theme (what moves): *saddle, clothe, water*  
 d. Manner (how the agent goes about the action): *stroke, rub, wipe, caress, touch*

- These subtypes may affect argument realization, For example, using **event structures** — descriptions of the kinds of events verbs describe, which we'll come to next time — Rappaport Hovav and Levin propose that roots determine the template they occur in via “canonical realization rules” (see also Marantz 1997, Alexiadou et al. 2006, Ramchand 2008):

- (26) a. externally caused state → [ [ *x* ACT ] CAUSE [ BECOME [ *y* < STATE > ] ] ]  
 b. place → [ [ *x* ACT ] CAUSE [ *y* MOVE TO < PLACE > ] ]  
 c. manner → [ *x* ACT<sub><MANNER></sub> ]

#2 Even within a class, roots may also predict which verbs show which argument realizations, as with the transitive/inchoative alternations with *spray/load* verbs (Hale and Keyser 1997):

- (27) a. Alice sprayed the water onto the wall. (caused change-of-state)  
 b. The water sprayed onto the wall. (change-of-state)  
 (28) a. Alice smeared mud onto the wall. (caused change-of-state)  
 b. \*Mud smeared onto the wall. (\*change-of-state)

#3 One final possible ramification of this split: could roots or templates limit the set of possible verb meanings, i.e. is there a class of *impossible* verbs?

- If there is a constraint on possible templates due to what the basic set of primitive events is, this might predict this (Jackendoff 1972, 1976, 1983, 1990, Rappaport and Levin 1988, Levin and Rappaport Hovav 1995, 1998, Van Valin and LaPolla 1997).
- For example, the subject of a sentence when there is a patient object has to be a causer of some kind, or at the very least, not a patient. In other words, the following is ruled out:

- (29) There is no verb *grimp* as in *x grimped y* meaning *x's dying caused y's dying*.  
 a. \*< Patient, Patient >  
 b. \*[ [ BECOME [ *x* < DEAD > ] ] CAUSE [ BECOME [ *y* < DEAD > ] ] ]

- Indeed, the lack of a causative/inchoative alternation with *hit* may be because while there are event structures with a moving figure and a location there's none with just the latter:

- (30) a. [ *y* MOVE TO [ PLACE *z* ] ] (motion is two place)  
 b. \*[ PLACE *z* ] (pure location without predication)

- The opposite question is whether there are limited sets of idiosyncratic meanings (an idea first floated by Dowty 1979). Such conditions have been suggested before.

- Rappaport Hovav and Levin (2010) suggested that roots can only have a limited set of meanings, describing a type of (result) state or a type of manner, but never both at the same time:

- (31) a. **Result roots:** break, crack, shatter, burn  
 b. **Manner roots:** run, jog, swim, laugh

- But there is debate about this — Goldberg (2010), Beavers and Koontz-Garboden (2012, 2017, 2020) and Rissman (2016) have suggested that there are no limits on how much meaning a root can have (see also Grimshaw 2005 on root meaning complexity).

Word meanings are broken into (a) regular meanings that define word classes and (b) idiosyncrasies that distinction words within a class, providing two axes of variation.

- FYI: What the right analysis of templates is, and how other factors like truth conditions matter, is the topic of next week’s lecture (Beavers 2006, 2010, Beavers and Francez 2012).

#### 4 The Scope of Variation in Verbal Behavior in One Language

- The variation in argument realization above so far hasn’t been too bad. But it gets gnarlier. Levin and Rappaport Hovav (2005) distinguish two types of variable argument structure.
- What we have so far seen are **argument alternations** where one or more arguments that seem to be part of the verb’s lexical content have multiple realization options, with a semantics that’s still pretty similar regardless of how that argument is realized:

(32) **The Causative Alternation**

- a. The vase broke.  
 b. Kim broke the vase.

**The Locative Alternation**

- e. Kim sprayed paint onto the wall.  
 f. Kim sprayed the wall with paint.

**The Dative Alternation**

- i. Kim sent a letter to Sandy.  
 j. Kim sent Sandy a letter.

**The Conative Alternation**

- m. Kim kicked Sandy.  
 n. Kim kicked at Sandy.

**The Object Drop Alternation**

- c. Kim ate a pie.  
 d. Kim ate.

**The Clear Alternation**

- g. Kim cleared the dishes from the table.  
 h. Kim cleared the table of dishes.

**The Benefactive Alternation**

- k. Kim baked a cake for Mary.  
 l. Kim baked Mary a cake.

**The Preposition Drop Alternation**

- o. The man climbed the stairs.  
 p. The man climbed up the stairs.

- However, while verbs with similar meanings do show similar alternations, there can be *a lot* of subclasses, and even then there is idiosyncratic variation (see above).
- There are also what Levin and Rappaport Hovav (2005) described as **event composition**, where a verb seems to show up in argument frames that involve participants not thought to be part of their lexical meaning (data drawn from Rappaport Hovav and Levin 1998).

- (33) a. Terry swept. (pure action)  
 b. Terry swept the floor. (action on place)  
 c. Terry swept the crumbs into the corner. (motion towards)  
 d. Terry swept the leaves off the sidewalk. (motion away)  
 e. Terry swept the floor clean. (change-of-state)  
 f. Terry swept the leaves into a pile. (creation)

- (34) a. Kim whistled. (pure sound emission)  
 b. Kim whistled at the dog. (directed sound emission)  
 c. Kim whistled a tune. (complete performance)  
 d. Kim whistled a warning. (message delivered)  
 e. Kim whistled me a warning. (message delivered to individual)  
 f. Kim whistled her appreciation. (message delivered)  
 g. Kim whistled to the dog to come. (message delivered to individual)  
 h. The bullet whistled through the air. (sound plus motion)  
 i. The air whistled with bullets. (sound plus motion)
- (35) a. Pat ran. (pure motion)  
 b. Pat ran to the beach. (directed motion)  
 c. Pat ran herself ragged. (change of state of moving figure)  
 d. Pat ran her shoes to shreds. (change of state of something else)  
 e. Pat ran clear of the falling rocks. (change of location and state)  
 f. The coach ran the athletes around the track. (caused motion)
- (Rappaport Hovav and Levin 1998: 97-98, (1)-(3))

- Can we possibly capture this by positing one verb and a simple set of linking rules?
- *Prima facie*, it seems many verbs can occur in too wide a range of argument realization frames with different associated meanings to give them a truly unified analysis.
- At this point one might begin to consider an alternative: could it be that the syntactic constructions here are what are meaningful, and the verb(al roots) are being massaged somehow into each frame (Goldberg 1995, Folli and Ramchand 2005, Borer 2005, 2013, Harley 2012)?
- This is a significant debate that I won't delve into here, although there are still patterns that delimit the empirical scope of facts that are part of the debate.

#1 The patterns above are representative once again of whole classes of surface contact, sound emission, and manner of motion verbs, suggesting again lexical conditioning.

#2 There is also microvariation within classes, i.e. *cross-cutting classifications*. Even within sound emission verbs there's variation in which allow a causative/inchoative alternation:

- (36) a. The tea kettle whistled  
 b. \*The boiling water whistled the tea kettle.

- (37) a. The teacups clattered.  
 b. I clattered the teacups as I loaded the dishwasher.

(Levin and Rappaport Hovav 2005: 10, (2), (3))

- Surface contact verbs differ in which result expressions they allow:

- (38) a. The sheriff shot/battered the outlaw to death.  
 b. The sheriff shot/\*battered the outlaw dead. (based on Beavers 2008)

#3 Event composition frames do not seem as applicable to change-of-state verbs:

- (39) a. \*Kelly broke. (pure action)  
 b. Kelly broke the table. (change of state)  
 c. \*Cinderella broke her fingers to the bone.  
 d. \*The clumsy child broke the beauty out of the vase.  
 e. \*Kelly broke the dishes off the table.  
 f. \*Kelly broke the dishes into a pile.

(Rappaport Hovav and Levin 1998: drawn from 102-103, (5)-(10))

- Now, this is a lot of variation, but there are possible generalizations and explanations:
  - Much event composition involves composing a verb with a secondary predicate to describe an outcome arising from the verbal event, giving a unified analysis (see e.g. Wechsler 2005); if so the apparent variation might just be superficial.
  - Rappaport Hovav and Levin (1998) suggest that it all has to do with “template augmentation”: making more complex events out of smaller events. Change-of-state verbs are already complex, and maybe can’t be made more complex.

The variation in verb use is enormous, but not so much that we need to give up!

## 5 Cross-Linguistic Variation: A Further Window into Lexical Semantic Theory

- There is still further systematicity and variation. Translations of *break* type verbs in other languages tend to have inchoative variants, but not translations of *hit* type verbs (Levin 2013).

(40) Kimaragang Dusun *break* but not *hit* verbs participate in the causative alternation:

a. **Breaking verbs (excerpted from Kroeger 2010: 4, Table 1)**

Root	Gloss	Intransitive	Transitive
babak	‘shatter’	mabak	mamabak
kinis	‘tear (e.g. cloth)’	kuminis	monginis
lapak	‘split’	lumapak	mangalapak
lupi	‘fold’ (e.g. cloth)’	lumupi	mongolupi
putut	‘break (rope etc.)’	mutut	momutut
tipu	‘break (stick etc.)’	tumipu	monipu
uyas	‘pull apart’	muyas	monguyas

b. **Hitting verbs (excerpted from Kroeger 2010: 4, Table 1)**

Root	Gloss	Intransitive	Transitive
bobog	‘beat (w. stick)’	*mobog	momobog
duntuk	‘bump, knock’	*dumuntutuk	mongoduntutuk
duntung	‘punch (w. fist)’	*dumuntung	mongdoduntung
lapis	‘slap’	*lumpais	mangalapis
pasut	‘cane’	*masut	mamasut
sudsur	‘poke’	*sumudsur	monudsur

- Across languages these two verb types cluster as distinct in other ways. For example, *hit* but not *break* verbs often allow their objects to be realized as oblique phrases (i.e. not a canonical subject or direct object), either categorically or at least optionally:

- (41) a. *M raudi L \*(kau) bau-t-ida.*  
 M SUBJ L at hit-TA-3S  
 ‘M hit L.’
- b. *Aaka bakaka ulni-ki pankā (\*kau) bah-t-ida*  
 this child writing-1S stick at break-TA-3S  
 ‘This kid broke my pen.’ (Ulwa; Andrew Koontz-Garboden’s field notes)
- (42) a. *thub=bstan-gyis blo=bzang-la gzhus-song*  
 Thubten-ERG Lobsang-LOC hit-PERF  
 ‘Thubten hit Lobsang.’ (Tibetan; DeLancey 2000: 6, (18))
- b. *thub=bstan-gyis dkar-yo cig bcag-song*  
 Thubten-ERG cup a break-PERF  
 ‘Thubten broke a cup.’ (Tibetan; DeLancey 1982: 23, (6))

- *Hit* verbs but (but not *break verbs*?) sometimes get expressed via complex predicates either with a generic impact verb or a light verb or even a cognate object:

- (43) a. *thub=bstan-gyis blo=bzang-la mur=rdzog gzhus-song*  
 Thubten-ERG Lobsang-LOC fist hit-PERF  
 ‘Thubten punched lobsang.’ (Tibetan; DeLancey 2000: 13, (64))
- b. *Da:s woʔa: bi: bi-ett.*  
 father.ERG son.DAT fist.NOM beats  
 ‘(The) father beats (his) son.’ (Ingush; Nichols 1984: 188, (8))
- c. *O João deu uma bengalada ao Pedro.*  
 the John give.PERF.PST.3S a caning to.the Peter  
 ‘John gave a caning to Peter.’ (Portuguese; Baptista 2004: 36, (18c))
- d. *Ti đá một đá (và ôi).*  
 Ti kicked a kick on me  
 ‘Ti kicked me a kick.’ (Vietnamese; Pham 1999: 233, (10b,c))

- These patterns tie heavily into work on transitivity (Hopper and Thompson 1980, Tsunoda 1981, 1985, Malchukov 2006, Beavers and Zubair 2010). This research has explored what makes verbs “core transitives”, i.e. using nominative-accusative or ergative-absolutive cases:

- (44) a. *Hanako-ga Taro-o mita.*  
 Hanako-NOM Taro-ACC saw.  
 ‘Hanako saw Taro.’ (Japanese)
- b. *duyu-gu nama dayn-∅ yi:-y*  
 snake-ERG that man-ABS bite-NON/FUT  
 ‘That snake bit the man.’ (Yuwaalaraay; Croft 2003:144, (45))

- The intuition is that core transitive cases are reserved for when verbs meet some prototype (roughly, again, caused change-of-state). Here’s the list from (Hopper and Thompson 1980):

(45)		HIGH	LOW
	A. PARTICIPANTS	2 or more participants (A and O)	1 participant
	B. KINESIS	action	non-action
	C. ASPECT	telic	atelic
	D. PUNCTUALITY	punctual	non-punctual
	E. VOLITIONALITY	volitional	non-volitional
	F. AFFIRMATION	affirmative	negative
	G. MODE	realis	irrealis
	H. AGENCY	A high in potency	A low in potency
	I. AFFECTEDNESS OF O	O totally affected	O not affected
	J. INDIVIDUATION OF O	O highly individuated	O non-individuated
		proper	common
		human, animate	inanimate
		concrete	abstract
		singular	plural
		count	mass
		referential, definite	non-referential

- Thus change-of-state verbs are the most prototypical from a transitivity perspective, everything else less so. This fits neatly with the event composition and cross-linguistic variation data above, where *hit* verbs (and others) show more grammatical variation than *break* verbs.
- Yet languages may differ in how much “deviation” the core frame tolerates! English is pretty liberal, using core transitivity for *break* and *hit* verbs, but Tibetan clearly isn’t this way.

Just as verb meanings vary in ways that influence grammatical behavior, the correspondences principles relating meaning to grammar vary as well, another point of variation.

## 6 Moving Beyond Verbs

- So far I’ve talked mostly about verbs since this is the category where some of the richest theories of subcategories of words have been developed. But there are interesting generalizations in other categories as well. Here I give a quick discussion of adjectives.
- Dixon (1982) argued for a classification of adjectives that describe so-called “property concepts” (that can hold of something for purely inherent reasons, roughly) into 7 basic types:

(46)	<b>dimension</b>	big, small, long, tall, short, wide, deep, etc.
	<b>age</b>	new, young, old, etc.
	<b>value</b>	good, bad, lovely, atrocious, perfect, proper, etc.
	<b>color</b>	black, white, red, etc.
	<b>physical</b>	hard, soft, heavy, wet, rough, strong, hot, sour, etc.
	<b>speed</b>	fast, quick, slow, etc.
	<b>human propensity</b>	jealous, happy, kind, clever, generous, cruel, proud, etc.

- He gives numerous diagnostics motivating these (Dixon 1982: 17, Table 1 summarizes). One bit of evidence is relative ordering in English in attributive modification:

- (47) value > dimension > physical property > speed > human propensity > age > color  
 a. old white truck, good tall ladder, fat old sun  
 b. ?white old truck, ?tall good ladder, ?old fat sun

- This suggests again that there are lexical semantic generalizations in the meaning-to-grammar relation. Furthermore, this is attested in other languages as well, even languages where the adjectives follow the noun (sometimes with the relative ordering mirror-imaged).

- (48) a. *cwpan mawr gwyrdd Sieineaidd*  
 cup big green Chinese  
 ‘A large, green, Chinese cup’ (Welsh; Rouveret 1994: 213)
- b. \**cwpan Sieineaidd mawr gwyrdd*  
 cup Chinese big green
- c. \**cwpan Sieineaidd gwyrdd mawr*  
 cup Chinese green big

- There may even be deeper explanations: the ones that occur closer to the noun tend to more concrete in nature and less subjective (Sproat and Shih 1991).
- There are also exceptions, albeit subject to semantics. Among others, Teodorescu (2006) notes that non-intersective adjectives — adjectives whose meanings do not just narrow down whatever they apply to — are not subject to adjective ordering constraints.

- (49) a. fake old gun  
 b. old fake gun

- Given that ordering of intersective adjectives should in principle not matter semantically, but ordering of non-intersective adjectives will, this exception seems principled.
- Dixon’s classes, have further correlates. Some languages have a large supply of adjectives. But some have few, and concepts that in English are adjectives are instead nouns or verbs.

- (50) a. *Na’a ku masiva.*  
 PERF I poor  
 ‘I was poor.’
- b. *Na’a ku ’alu.*  
 PERF I go  
 ‘I went.’ (Tongan; Churchward 1953: 20)
- c. *àkwai shí dà w’āyō*  
 exists him with cleverness  
 ‘He is very clever.’ (Tongan; Newman 2000: 179)

- But even in small-adjective languages, there are generalizations. Dixon looked at 20 such languages (7 to 24 adjectives each, average 13), and found among their adjective inventories:

- (51) ‘large’ (20), ‘small’ (19), ‘short’ (15), ‘new’ (15), ‘long’ (14), ‘old’ (14), ‘bad’ (14), ‘white’ (14), ‘good’ (13), ‘black’ (13), ‘red’ (8), ‘raw, green, unripe’ (7)

- He then notes that there are two types of languages:

(52)  $\alpha$  Large open class of adjectives (English, Dyirbal)  
 $\beta$  Small(er) closed class of adjectives (Hausa)

- There are typological generalizations based on these:

- In  $\alpha$  languages, all types of property concepts are adjectives.
- In  $\beta$  languages, dimension, age, value, and color will go in there.
- In  $\beta$  languages, physical property tends to be verbs. *But* if there’s a somewhat larger closed set of adjectives, they’ll be adjectives.
- In  $\beta$  languages, if physical property is a verb, then speed will be an adverb. If physical property is an adjective, speed will be, too.
- In  $\beta$  languages, human propensities tend to be nouns. Even in English and Spanish this occurs (*hunger/hungry, tener hambre*). These are the last to go into the adjective class.

- These differences have other manifestations. The relationship between a basic Dixonian state and the inchoative that describes the change into that state is one of semantic expansion: the meaning of the verb embeds the meaning of the state but adds “(caused) change” to it.

- This is in turn sometimes indicated overtly also in the morphology:

(53) red/**red**den, sweet/sweet**en**, short/short**en**, length/length**en**, large/**en**large(**n**),

- But in languages where the basic state is a verb rather than an adjective or noun, the distinction is often not marked at all. So in Kinyarwanda, for example, the exact same form serves both functions (which are instead distinguished by tense and aspect; Jerro 2017b)

(54) a. *Ubu-ki bu-ra-ryoshy-e.*  
 14-honey 14.SBJ-NON.PST-sweet-PRFV  
 ‘The honey is sweet.’ (stative)  
 b. *Umu-vinyo w-a-ryoshy-e.*  
 3-wine 3.SBJ-PST-sweet-PRFV  
 ‘The wine became sweet.’ (inchoative; Jerro 2017b: 4, (9)-(10))

- Indeed, only languages that have stative verbs allow this (Koontz-Garboden 2006), which may follow from the fact that only verbs can represent change-of-state and thus only they can show this sort of ambiguity without (overt) category derivation (Bowler et al. 2022).

- Finally, Beavers et al. (2021) show that while Dixonian property concepts tend to be lexicalized as basic stative terms, states that must arise from change surface as deverbal statives:

(55)	language	root	simple state	inchoative	causative	result state
	Kakataibo	large	<i>ani</i> <sub>Adj</sub> ‘large’	<i>ani</i> <sub>V</sub> ‘enlarge’	<i>ani-o</i> ‘enlarge’	<i>ani-kë/ani-o-kë</i> ‘enlarged (inch/caus)’
	Kakataibo	wrinkle	—	<i>churi</i> ‘wrinkle’	<i>churi-o</i> ‘wrinkle’	<i>churi-kë/churi-o-kë</i> ‘wrinkled’

Grammar again seems sensitive to certain types of semantic classifications in multiple ways.

## 7 Conclusion and Notes on Lectures

- To sum up, what we have seen so far is the following general picture:
  - Word meanings are complex objects:
    - \* They are broken down into pieces.
    - \* We can identify those meanings by semantic tests and use in context.
    - \* Some meanings are shared across words (templates) and some are not (roots).
    - \* The pieces are structured relative to one another.
    - \* There is some logic for putting the pieces together into bigger meanings.
  - Word meanings figure into grammatical generalizations:
    - \* Linking principles describe these relationships.
    - \* Linking principles are sensitive to both the semantics and semantic structure.
    - \* Not every part of word meaning figures into grammar.
  - Both word meanings and the correspondences to grammatical properties are subject to inter- and intra-linguistic variation, albeit with some systematicity.

These factors point towards the need for a theory of word meaning and its grammatical ramifications in order to have a full understanding of the human language faculty.

- My goal over the next two lectures is to bore down into a couple of topics we touched upon above to reflect more on where I think the state of the art is and what the open questions are:

**Oct 13:** There are different theories for what a linguistically relevant lexical semantic ontology and structure is. What are the motivations for these and why, and how much is reducible to other aspects of lexical semantics, especially truth conditional meaning?

- This will be next week's topic, where I'll look at some case studies that I have worked on that has both sought to ground out lexical semantic structure in something that is truly semantic, while also acknowledging that this approach has its limits.

**Oct 20:** The idea that word meanings consist of templates and roots is widely accepted, but the focus of most work has been on templates, with less attention paid to roots, which are sometimes even dismissed as uninteresting. Is this justified?

- This will be the topic of the third lecture, where I'll look at case studies showing that template and root meanings are hard to tease apart, forming a continuum. This work has a strongly typological and cross-linguistic bent, thus showing the value of such work.

- While exploring these topics, there are some caveats I want to lay out right from the get go.

#1 As noted above, work in lexical semantics crosses a very diverse range of literature from different theoretical traditions and frameworks, maybe more so than other fields.

- However, despite the sometimes dramatic variation in theoretical perspectives, there is actually a very surprising amount of consensus on the big ideas.
  - Thematic roles vs. event structures is a common debate on what verb meanings are.
  - Templates vs. roots (regular vs. idiosyncratic meaning) is a common distinction.
  - The same notions come up again and again (causation, change, mass, count, etc.).
  - The relative role of syntax vs. the lexicon is a common theme.

- Yet it’s also my impression that the theoretical differences obscure the similarities, and blind people to big picture similarities, leading to redundancy and unnecessary debates.
  - I’ll be drawing on and often obscuring differences among a range of approaches, because I treat all of the literature as comprising “one field”, something I encourage everyone to do.
  - The task instead is to try to simultaneously understand (a) the bigger empirical patterns, (b) the deeper insights about what a theory of word meaning should look like in its basic properties, and only then (c) the particular theoretical details of a given analysis.
- #2 Likewise, a major source of variation across the field is how much “lexical semantics” is actually about *semantics*. Within some perspectives meaning is sometimes treated as a more grammatical fact than a semantic fact.
- But my view — and the driving force of much of my research — is that actual (truth-conditional) semantics should be kept front and center, since it is in many ways more basic than representations, which are abstractions.
  - Thus this talk series is informed by work from a traditional formal semantic perspective. But again, the insights of these papers (once the notation has been broken through) are in many ways much the same as in other literature.

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