Introduction

This isn't a seminar. It's a walk-about. We're going to read some of the literature on "argument structure," and accompany that reading with a look at some of the literature on the acquisition of argument structure.

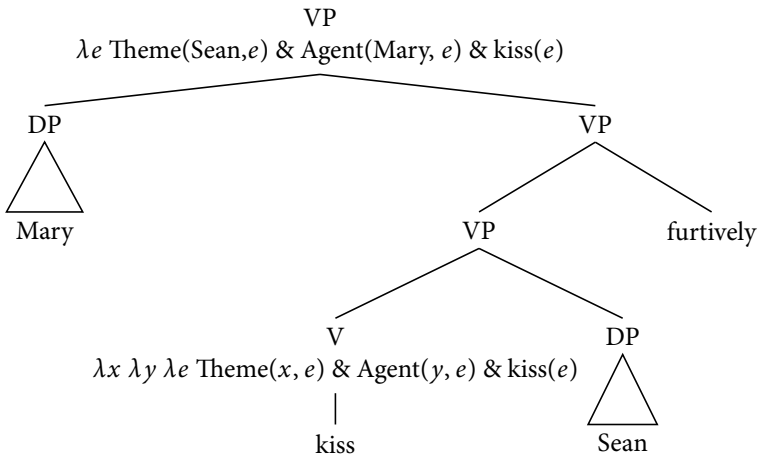
In part, then, we will be investigating the process that allows us to acquire the meanings of verbs and relate that meaning to the syntactic frames they can occur in. We'll need a theory that relates the meanings of verbs to the syntactic frames they occur in, and hopefully we can see connections between that theory and the acquisition process. These are sometimes known as "Linking Rules." There are a variety of ways to express Linking Rules; here are two cartoons.

1. The Lexicalist View
   a. The meaning of a lexical item is put together as a series of Theta Roles (Agent, Theme, etc.) or predicates/relations (cause, move, begin, etc.) that take arguments and which, together, characterize its core meaning, and
   b. An independent syntax structures how this verb plays with other words and phrases, and
   c. There is a universal mapping from the theta roles/predicates to the structures.

      Example

      kiss: Agent, Patient/Theme, ACC

      Patient/Theme is assigned to closest A position and Agent is assigned to Highest A position.

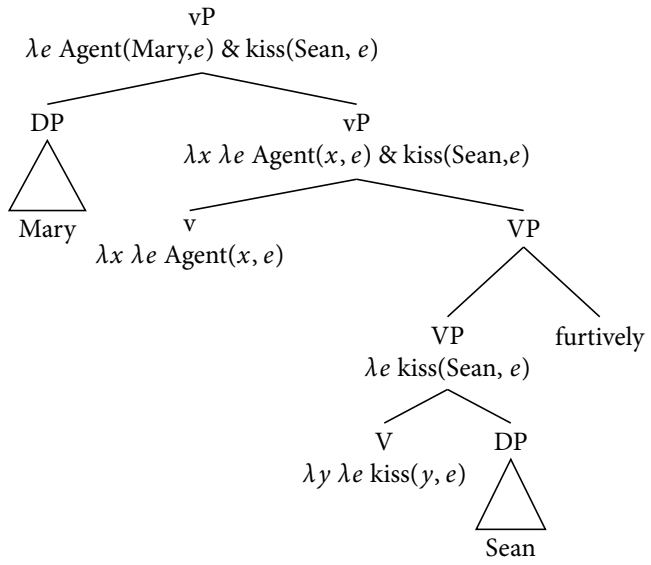


see Jackendoff (1972, 1974, 1990), Levin (1993), Chomsky (1981), Larson (1988)

2. The Constructionist View
   a. The meaning of a root is a simple predicate (or relation).
   b. A lexical item can be the result of putting that root together with other morphemes.
   c. The syntax/semantics controls how the morphemes combine to produce a lexical item.

      example:

      $\sqrt{}$*kiss*: $\lambda x\ \lambda e$ kiss(x, e), *v*: $\lambda y\ \lambda e$ Agent(x, e), ACC



see Kratzer (1996), **?**, Pylkkänen (2008), etc.

Note that we have to ensure that *furtively* doesn't get into the argument structure of the verb. I think this is usually done by controlling the syntactic or semantic types of the arguments. Note that on the constructionist view, the role of the linking rule in the lexicalist view is played by something that forces v to select a VP, or prevents a V from selecting a vP. And, finally, notice that there is additional information that comes with the morphemes, like for instance what Case they assign.

There is some reason to think that the linking rules, or their equivalent in the constructionist view, are universal (or close to universal). There are strong cross-linguistic generalizations. For instance, Keenan (1976) shows that the correlation between being "subject" and being an "Agent" is strongly present cross-linguistically. The exceptions tend to be in the realm of causatives, as in English's:

(1) Mary ran the dog down the street.

And Dryer:Dryer (1986) shows that many of the general things we'll see about the double object frame in English are reproduced in many other languages.

How do we characterize alternations on these views?

1. Changes to the Cases assigned by morphemes: both frameworks
2. Changes to the theta-roles assigned to the morphemes: both frameworks
3. Manipulate the syntactic arrangement of morphemes: Constructionist
4. Manipulate the linking rules: Lexicalist

Example:

(2) Passive: Accusative Case is deleted from a verbal morpheme.
   a. Passive morpheme is an argument that can only bear AGENT, and it can be double by a *by* phrase: Lexicalist
   b. Subject Case must be assigned and *by* can be appended to a subject argument.

If enough of the syntax is in place, then learning the passive alternation could largely boil down to learning (2). A wonderful thing about the Passive is that it really works quite well. If a verb assigns accusative Case in English, then it is very likely that it will be able to passivize and the results are perfectly predictable. There *are* counter-examples, but they are few and lend themselves to a story.

(3) a. This weighs 10 pounds.
   b. * 10 pounds is weighed by this.
   c. This costs 10 pounds.
   d. * 10 pounds is costed by this.

We're going to begin by looking at the dative alternation, illustrated by the pair in (4).

(4) a. Mary gave the book to Sean.
   b. Mary gave Sean the book.

Unlike the passive, however, this alternation is not productive at all. Famously, for instance, the very similar *contribute* does not show up in both frames.

(5) a. Mary contributed the book to Sean.
   b. * Mary contributed Sean the book.

And similarly, *deny*, has only one of the two frames.

(6) a. * Mary denied the book to Sean.
   b. Mary denied Sean the book.

Baker (1979) points out that this presents a difficult learnability problem. How are children to discover that *contribute* and *deny* have only one of the two frames involved, whereas *give* has both. Baker suggests that the solution must be that children only posit a syntactic frame for a verb upon hearing evidence for that particular mapping. That is, they are conservative. This is, in some sense, to deny

that there is any alternation in (4). Baker's suggestion is that children merely learn different argument structures for each of these relevant verbs.

However, there are enough verbs that participate in pairs like (4), and, moreover a kind of regularity to them, that it is prima facie unlikely that we are dealing with simple homophony. There is also direct evidence that a regular process controls the alternation. Both adults and children can coin new double object verbs.

(7) a. She faxed me this.
b. She xeroxed you these.
c. Shin me the ball.

In Gropen, Pinker, Hollander, Godberg, and Wilson (1989), children were presented with scenarios where a character transports another character in a gondola car to some goal, and sentences like "The bear is pilking the pig to the giraffe." They were then presented with similar scenarios and asked to describe those scenarios. For 6 to 8 year olds, they would respond with double object constructions (X is pilking Y Z) 44% of the time.

We can conclude that knowing that a verb can sit in the frame "X verbed Y to Z" sometimes enables the knowledge that the same verb can sit in the frame "X verbed Z Y." This is the alternation we want to model. If there really is a process here that produces the alternation, then we are back to Baker's problem. How do children know that when this process allows the alternation, as in *give*, and when it doesn't, as in *contribute* and *deny*.

In the absence negative information – corrections in one form or another – the only idea anyone has had is that the process is sensitive to something that distinguishes the verbs *give* and *contribute*/*deny*. In learning the argument structures, and perhaps other information, that comes with these verbs is sufficient to know which are subject to the process and which are not.

The first, and most influential, crack at finding what distinguishes the verbs is Green (1974). Her leading idea is that the argument structure of the double object frame and the argument structure of the PP-frame are different. To see her idea, consider the pairs in (8) and (9).

(8) a. Mary threw the ball to John.
b. Mary threw John the ball.

(9) a. Mary baked a cake for John.
b. Mary baked John a cake.

The *to*-phrase in (8a) is a locative. We can see that from (10), and the knowledge that *where*/*there* are unambiguously locatives.

(10) a. Where did Mary throw the ball?
b. Mary threw the ball there.

But the argument *John* in (8b) is not a locative, as we can see from (11).

(11) * Mary threw there the ball.

This is also what lies behind the contrast in (12).

(12) a. ?? Mary threw first base the ball.
b. Mary threw the ball to first base.

Green suggests that the first argument in a double object construction is a possessor, and locations cannot be possessors:

(13) * I bought there's baseball.

A similar kind of contrast can be detected – or is it manufactured? – in (9). The *for* argument in (9a) is a benefactive. *John* benefits from Mary's baking. (Not quite true, of course, since (9a) remains true even if Mary's intention is to kill John with her cake.) By contrast, (9b) is only true if Mary's intention is that John possess the cake she bakes. Green's proposal, then, is that the argument structures for the double object and PP frames are roughly those in (14).

(14) a. Double Object frame:
X causes Y to have Z by Ving Z.
b. PP frame:
X Vs Z on behalf of Y or X Vs Z so that Z goes to_{loc} Y

This would provide a solution to Baker's problem if (15) were true.

(15) Only those verbs whose meanings are compatible with either of the argument structures in (14) alternate. I suppose it's sensible to think that both *throw* and *bake* have meanings that fit the relevant frames in (14).

But what of our non-alternators *contribute* and *deny*? Consider first *deny*. *deny* doesn't fit the Double Object frame, and that's a problem. So, we need to broaden the Double Object frame to include (16).

(16) X causes Y to not have Z by Ving Z.

Other verbs like *deny* are:

(17) a. She bet me $5.
b. She charged me $5.
c. She fined me $5.
d. This cost me $5.

(Notice how we now can see the solution to why *This costs $5* doesn't passivize.) None of these have the PP-frame.

(18) a. * She bet $5 to me.
b. * She charged $5 to me.
c. * She fined $5 to me.
d. * This cost $5 to me.

This could be related to the idea that none of these verbs readily fit into the locative frame. That is, perhaps *bet*, *deny*, etc. cannot be conceptualized as moving money away to someone.

But then, why can't they be conceptualized as moving money away from someone, in which case we'd expect:

(19) a. * She bet $5 from me.
b. * She charged $5 from me.
c. * She fined $5 from me.
d. * It cost $5 from me.

We should not only have an explanation for which verbs participate in the alternation, but also for which prepositions do.

Next, let's consider *contribute*. In fact, the problem with *contribute* is that it doesn't fit the PP schema, since it does not have a use in which its *to* argument is a location.

(20) a. * Where did you contribute $5.
b. * I contributed $5 there.

Actually, this is also true of *give*, as Hovav and Levin (2008) show.

(21) a. * Where did you give $5.
b. * I gave $5 there.

The *to* argument in these cases really is closer to possessor. So we should allow (22) to enter into the alternation as well.

(22) X Vs Z so that Z is $\text{to}_{\text{possessed-by}}$ Y.

It is difficult to see how *give* and *contribute* could have argument structures different enough for the process that allows the alternation to occur to distinguish them.

One idea about what distinguishes *give* from *contribute* which Green suggested (as well as Oehrle 1976) and is championed in Pinker (1989) is that *give* belongs to the native Germanic vocabulary and *contribute* entered the language through Romance languages. This historical distinction maps roughly onto a synchronic one. The negative prefixes *in* and *un* also come from Germanic and Latinate respectively, and they overwhelmingly go on roots of the same class. Baldi, Broderick and Palermo (1985) show that English speakers are sensitive to this distinction with nonce words. Perhaps, then, so is the process that is responsible for the dative alternation. In an unpublished paper by Grimshaw and Prince, Pinker reports that this distinction in the dative alternation is not accurately historical, as we might expect, but instead is prosodic at root. Germanic verbs tend to be shorter than Latinate in English, and they typically have the Germanic stress pattern, which places primary stress on the first syllable. Perhaps, then, our verbal vocabulary is divided into two groups based on their prosody, and the dative alternation is defined for just one of those groups: the Germanic one.

Gropen et al. (1989) try to assess whether adults work this way. They taught 64 native English speakers (aged 17–41) words with paragraphs like (23) and (24).

(23) Possession
Gail, a brand new graduate of Automata Inc. was eager to help Frank with his presentation. She thought that by running the pell program on his incomplete file, it would produce quite a presentable report. And sure enough, after Gail pelled the report for Frank, he was ready to make a great impression.

(24) Non Possession
George, the famous computer programmer, was disgusted by the data matrix which Carl had showed him. The matrix was so difficult to read that he decided to use pell, his new program which was designed to remove excess spacing from a file and thereby save disk space as well as eye strain. Carl was certainly grateful after George had pelled the matrix for him.

As you can see, the presentation distinguished whether the verbs were compatible with a possession reading or not. They also differed with respect to the Latinate/Germanic criteria; they were:

(25) a. norp pell, moop, tonk
b. calimode, repetrine, orgulate, dorfinize

Following each paragraph was a list of 11 sentences and rating scales. Two of the sentences were of the double object and PP frame, and the rest were distractors. The rating scale was from -3 ('completely odd') to 0 ('don't know') to 3 ('perfectly natural'). Here are the results. (I've collapsed the cases involving *to* and *for* — both were included, and there are differences between them.)

(26)

PP frame

	Possessive	Nonpossessive	Mean
monosyllabic	2.68	2.77	2.73
polysyllabic	2.69	2.76	2.72
mean	2.68	2.77	2.72

Double Object

	Possessive	Nonpossessive	Mean
monosyllabic	0.34	-1.88	-0.77
polysyllabic	-0.12	-2.00	-1.06
mean	0.11	-1.94	-0.92

(Gropen et al. 1989, table 9, p. 223)

There is a significant difference between the possessive/non-possessive dimension for the double object verbs. The Latinate/Germanic distinction was only significantly different for one scenario:

(27) Sue, who had wanted the deed to the house for twenty years, was very excited when her lawyer called with the good news. Her lawyer told her that Bob, the current owner, was ready to begin pellation, the formal (and only legal) process by which she could obtain the house from him. After Bob had finally pelled the house to Sue, she pelled her duplex to Francis.

They conclude that both the possession/non-possession contrast matters, and that the latinate/germanic contrast does. But, interestingly, not for all kinds of double object constructions.

Gropen et al. (1989) also looked to see if the Latinate/Germanic difference played a role in children's use of the double object construction. Interestingly, what they found was that neither the children's speech nor their parents had any instances of Latinate verbs at all, in either frame. The sole exceptions are *promise* and *finish*, both of which have Germanic prosody. So this wasn't testable. But, in fact, children made very few errors — a mere 22 in the double object frame out of thousands of utterances. And those errors were very circumscribed.

(28)

	ungrammatical		grammatical		grammatical types
	Tokens	Types	Tokens	Types	also used by adults
Adam	5	3	118	13	11
Eve	11	1	11	5	5
Sarah	0	0	73	12	10
Ross	3	2	172	13	11
Mark	3	2	36	8	7

(Gropen et al. 1989, table 8, p. 219)

Some examples:

(29) Mommy, fix me my tiger. (Adam 5;2)
I gon' put me all dese rubber bands on. (Adam 4;1)
Pass me some more horsies (Eva 2;0) (pass some more horses for me.)
You please write me a lady. (Eve 2;3) (Write a lady for me.)
Don't say me that. (Ross 3;3)
You ate me my cracker. (Ross 3;3) (Gropen et al. 1989, p. 217)

Pinker (1989) suggests that the alternation is indeed defined over the Greenian argument structures, but that within these frames there are smaller subclasses of verbs that can be defined in other terms through which the process is, or is not, generalized. These subclasses could be defined prosodically, as the Latinate/Germanic contrast is, or they could be defined in finer grained semantic ways. Indeed, they cross-cut, he suggests. The Latinate/Germanic distinction is, as the Gropen et al study suggests, restricted to certain sorts of meaning relations. So, for instance, verbs of giving and sending obey it, but verbs he — following Green — designates as verbs of "future having" do not.

(30) a. *give*, *pass*, *hand*, vs. **donate*, **contribute*
b. *send*, *ship*,. *mail* vs. **transport*, *?deliver*
c. *bequeath*, *refer*, *recommend*

As an example of the kind of semantically defined subclasses that Pinker envisions controlling the alternation, consider (31).

(31) a. verbs of ballistic motion:
Lafleur throws/tosses/flips/slaps/kicks/pokes/flings him the puck.
b. verbs of accompanied motion:
**I carried/pulled/pushed/schlepped/lifted/lowered/hauled John the box.*
(Pinker 1989, (4.13)–(4.14): 110-1)

He suggests that what might be relevant in distinguishing these two is that the verbs of ballistic motion are defined in terms of the endpoints of the path, and the kind of force applied to create it. By contrast, the verbs of accompanied motion are defined by the path itself. Perhaps the possession frame that defines the double object construction is defined over the endpoints of a path, but cannot be defined by the path. Similarly:

(32) a. verbs of communication:
She should tell/show/teach/write/spin/read/quote me a story.

b. verbs of manner of communication:
John shouted/screamed/murmured/whispered/shrieked Bill the news.

Think of communication verbs as moving information from one point to another. What defines the verbs of communication is how that information is received. What defines the verbs of manner of communication is how the information is conveyed.

Pinker (1989) suggests that a model that includes:

(33) a. general semantic schemas ("broad conflation classes") that carve up how events are conceptualized. Pinker calls these thematic cores.

b. linking rules that determine how a schema gets projected onto a syntactic/morphological realization.

c. related semantic schemas that one root can express (these are the alternations)

d. linguistically demarcated subclasses of lexical items ("narrow conflation classes") that control which lexical items get to participate in the alternations.

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