Chapter 6: How Do We Manage Meandering Meaning (NN1)

Children seize grammar's power and their ideas just burst out:

"Don't uncomfortable the cat!"

"I'm nicing him"

"Don't giggle me"

"we snuggle ourselves too warm"

"I'll jump that down" (NN2)

Nouns and adjectives turn into verbs when needed, intransitives (*I giggle*) become transitive (*Don't (you) giggle me*). In some languages this ability flourishes forever. In English, it dies out, though it is not really clear why. Is it the grim hand of "correctness," odd parental frowns, or deeper bias in the grammar itself that drives out new verbs and restrains our children? One can only wonder. Perhaps it reflects seeing part of a mechanism before the whole comes into view.

Adults easily assume that children "don't know the rules of grammar" but even the most startling creativity has a system behind it, though it is sometimes hard to see.

We all build sentences step by step that simultaneously build meaning step by step via the engine of recursion. We saw meaning being built noun by noun in a sequence like: *city garbage committee meeting.* The recursive engine then serves like a chassis on which are laid other systems that seem to fit only imperfectly, but function organically and move swiftly.

Often meaning seems to come in at odd angles, like through word endings (morphology). Many patterns seem halfway between structure and meaning. The most obvious example is in the familiar vagaries of gender. (NN3) In many languages, every noun has to have an article that is linked to formal gender, but it is not necessarily real gender. The expression *das Mädchen* (the girl) in German is neuter, though the true reference is obviously feminine. What seems to have a semantic origin has been "grammaticized" to be a formal notion no longer linked to its origins. Does the child follow the same path from semantic to syntactic? Does he learn feminine articles only with truly feminine nouns first? Or does the leap to a formal notion just happen instantly for the child? It is not easy to tell if there is a first, quick stage in which children force form to match meaning. Perhaps the child does use femine *die* in German with a female first, and within a few minutes extends it to other nouns that have no gender. We researchers can never be quick enough to know. The leap from meaning to

form seems easy for all children. And where the child goes too far, we can actually see the mechanism at work. Here is a case in point:

Patrick Griffiths reported to me that he found a child who called everyone "he" (other children label everyone "she"). To probe further, he put out a male and a female doll and asked the child to point to she, which the child obligingly did (pointing to the female), then he coyly pointed to the child's mother and said: "how about your mother" to which the boy confidently replied:

"he's *she*"

Now let's get beyond the charm: what does this mean? Not someone who is imposing a male perspective, but a child who seems to have identified an abstract notion of person above a gender identification for *he*. And the child must have done so with no specific evidence in English. So the child is seeking abstraction, seeking a gender-neutral pronoun for people that is defined in grammar, but not definable in a world where every person has a gender.

Evanescent Avenues of Agency

Another notion that comes into grammar at very odd angles is Agency. As we shall show, it can be in morphology (*-er* endings), structure (subject), or just implied (agentless passive). Sometimes it is explicit,

sometimes not. It must seem evanescent to the child still uncertain about which grammar he hears. Each type of agency creates a challenge that every child must get right.

If Agent were a free-standing concept we might expect to find an ending that means Agent anywhere. The affix *–er* seems to fit the bill. If I say: what is a baker, builder, sweeper, folder, or a new one like establisher, confuser, you know what it means. *Confuser* means exactly the person who confuses someone, etc. But *-er* is not freely useable. If it were, then we should be able to add it to natural instruments too, just looking around the dinner table: **forker*, **glasser*, **bowler*. Each of these could have a natural meaning (one who uses a fork), and yet they are not words of English, nor possible words (unless they are narrow idioms). So *-er* has some restriction on it, and this restriction on *-er* is not instantly known by children. Here are some examples that I have heard:

> "I'll be the listener and you be the storier"
>
> "Dad, you are a mistaker" (NN4)

In fact spontaneous, erroneous "*–er"* has been reported in many languages for children. Are such uses a guess, otherwise impossible under UG? Hardly.

Such a first guess in fact is close to other endings like *–ist* or *–eer* which do attach to nouns, or both nouns and verbs:

machinist, violinist, ventriloquist

engineer, profiteer, orienteer, musketeer

Disney invented *mousketeer* and they advertise, with no irony, for imagineers. So we can still invent new *–eer* words, but they remain closer to poetic license than rules of grammar that race around without forethought. We feel that *–er* is linked to Agents because we feel that it is the real rule, actually productive. That feeling is the feeling that a grammatical machine is present inside us.

Now we have some predictions: if given a choice, a child should choose Agent. Or could it be broader: Agent or Instrument, but not Object. What will they choose?

EXPLORATION 6.1: ER, WHAT'S THAT?

Here is a simple thing to try:

Take a chicken about to be put into the pot and ask:

"Show me the broiler."

Will it be you, the pot, or the chicken? Now put some bread in an oven and

ask:

"Show me the baker."

And now put some toast in a toaster and say:

"Show me the toaster."

Will you get: broiler = object (theme), baker = agent, and toaster = instrument? We should get them if the child knows these words. If not, Agent is the prediction.

What happens with a novel case. Try this:

Cut some paper and ask:

"Show me the cutter"

Push a toy truck with your hands

"Show me the pusher"

Caption: "-er" as Agent, Object, and Instrument

Adults are very unlikely to point to the paper or the truck. Informal experience suggests that children might do just that.

Extension:

Completely novel cases can be pursued as well which Val Johnson has done in her dissertation. (NN5) She gave children nonsense verbs like:

"John *tems* the boy

[does some strange action with an instrument]

Point to the temmer."

Here children who otherwise indicate characteristics of speech pathology often show great uncertainty.

A Projection from the Verb

What then is special about *–er*? What axis do all these facts revolve around? The steady fact is that Agency is always found with an Action Verb. Therefore we can argue:

> *–er* carries a meaning projected from the verb, therefore it does not have its own meaning.

So now we predict that if a verb expresses a State, then there is no action or Event for which one could be an Agent, so no *–er* should be possible. And indeed, these are pretty weird:

*seemer

*appearer

*look-liker (or *like-looker)

*beer (=be+er)

Suppose someone does something deliberately like "John works hard to be tough." A non-agent verb will not allow *–er*. One cannot say: **John is a tough-beer*. It is not the " agentive" situation ("works hard to"), but the grammatical nature of the verb—-it carries no agent---so no *–er* is possible on **be-er* or **seemer.* (NN6)

By now, the reader familiar with our method should be eager to find out: does a child really know this and can we show it? Here is a thought-experiment whose results are so obvious it hardly seems worth doing, but it might be amusing.

EXPLORATION 6.2: IF YOU TRY TO BE BIG, ARE YOU A BIG BEER?

Scene: casually carry a big bottle of beer in and put it on a table. (You could say nothing or just "let me put my beer here for a minute.")

Take out some dolls and say:

"These dolls are different. These two just sit, but: This boy likes to be angry

This boy likes to be sad

This girl likes to be loud

Can you show me a beer?"

Or let us push it:

"This boy tries to be big."

(stands on tiptoes or something)

"Can you show me a big beer?"

Prediction: laughter or some sense of rejecting this usage of *–er*.

Caption: "-er" not allowed to be Agent

All the context we can muster in this heavy-handed scene is unlikely to persuade the child to point to a doll and not the bottle. (Actually, an undergraduate tried just this experiment and did not find children willing to consider "beer" a person.) If the doctrine that the context can force the child to override the grammar was really true, then it should be true here as well.

The power of the grammar should be impressive here. The simple, natural-seeming concept: *-er* = person who does something cannot apply to a verb that does not project a notion of Agency itself, no matter how pointedly we pursue it.

Real knowledge of the grammar shows up most sharply when we create a situation that invites a violation of grammar, but the child maintains his grammar nonetheless. It reflects the creativity behind language: language is not a re-enforcement of visual reality, but an instrument of imagination. It is where our (and the child's!) courage to change reality crystallizes. Therefore we purposely, though not consciously, follow the meaning of the grammar before we let it be

influenced by context. So it cannot and should not be a perfect mirror of context. Were grammar only a mirror of context, the status quo would reign! Instead, our sentences can be about how to change the world, or mock it, not just match it.

Yet just suppose the child does follow the force of context, of the situation, in our explorations, would it show that the grammar is subservient and just disappears? Not really. These explorations, like many experiments in science and medicine, are "proof positive." That is, if knowledge is demonstrated, it must be there; if not, then one does not know for sure where the failure lies. Perhaps the timorous child will now and then use his sense of context more than his sense of grammar even if the grammar says something else. The grammar could still be there.

An analogy for "proof positive" reasoning is in medicine. If you have a temperature, you are sick. If not, well you still might be sick. The premise of this book is much the same: we will do everything we can to discover what the child knows and not seek firm conclusions about what he may not know. The proof-positive experiments are always the ones that invite the imagination and really move science along (in physics as well as linguistics). These explorations help adults to appreciate and promote the child's acquisition of the fine structure of grammar, which is the essence of grammar. Sharp situations may be just what makes a concept click in the mind of the child.

So let's seek the edges of *–er* more audaciously. Just what will the child allow?

EXPLORATION 6.3: DOING SEEMING

Perhaps something slightly more plausible is worth pursuit:

> "Mary is making a dress and her mother seems eager to help her. Mary is working very hard on making the seam of the dress just right. But she did it wrong three times, she could not make that seam right! Her friend Johnny came and did it easily. Her mother seemed unhappy for Mary because she seemed disappointed. Then her mother seemed to quiet down when she gave everyone cake."
>
> "Show me the seemer."

Will we get Johnny or the mother, or Mary? If children take Johnny then they are showing subtle grammatical knowledge of the notion that Agent is linked to *–er* in a precise way.

Caption: More verbs where "–er" cannot be Agent

Only the noun *seam* has been mentioned, and yet it seems more likely that the child will turn it into a verb for "*seamer*" than allow *"*seemer*" from an actual verb that has no agent.

Is an action verb enough? Even action verbs have limits.

Consider this contrast:

a. John managed a store => store-manager

b. John managed a smile => *smile-manager

Why, exactly, if I can say: "John really tries to manage a smile on every occasion," is it amusingly wrong to say: *"John is a smile-manager"?

Shall we try it with a child? How about a story.

EXPLORATION 6.4: CAN ANYONE BE A SMILE-MANAGER?

Story: "The teachers have to manage the lunchroom at school. The children are often late and have orchestra practice right after lunch. But they always hurry up and try to manage lunch before music starts."

"Who are the lunch-managers?"

Will the child say "the teachers" or "the children" ?

Caption: Verbs of accomplishment prohibit compounds

What could tell them the answer is not "the children" ? Suppose there is a hidden *have* or *get* in the phrase "*manage lunch*." It is really "manage to get lunch." So now the hidden verb *get* blocks the creation of the compound form because compounds always just take the following word and flip it over to the other side.

Only *manage the store* allows the operation, so only the "teachers" should be the answer.

Many other verbs could be adapted:

a kitten can reach the top of stairs =.*top-reacher,

"yours" ends letters => *letter-ender,

dessert completes dinner => *dinner-completer.

One could adapt these verbs to a household or make up a story:

Our kitten loves stairs and she can reach the topstair for all the stairs in our house now. The kitten is a top…….

Will the child say: "*topstair-reacher" Or avoid it and more likely say "top-stair-lover"? One should prime the child with acceptable compounds. Something that opens cans is a can….. ("opener") (Thanks to Tim Roeper for examples and discussion.)

But now we have attributed a tremendously complicated form of knowledge to the child. The principles behind compound formation involve rejection of cases where there are <u>hidden</u> verbs.

"Only Connect" (EM Forster)

At some point the child connects to the verb inside the noun (*hunter* has *hunt*) and it is automatically linked to the Agent property of the verb. Now we predict other overgeneralizations, which sometimes occur. Consider the child who said:

"I like the hammer because I like to ham" (NN7)

He has decided that where an *–er* exists a verb must be behind it. This is the child who should now dump **storier* because there is no verb (or say "I like to story"). How does the child see the verb connection? It is actually a very challenging question because the child could think *–er* is really a compound like:

workman, taxman, garbageman, mailman, repairman

where it is really two nouns together which often cover exactly the agent relation. Some children do follow this route saying things like *cut-man*. (NN8) Something must tell the child that the ending on a verb picks out part of its meaning of the verb---that it really does not carry its own meaning most of the time. That realization is crucial to having the child realize that **beer* is impossible.

EXPLORATION 6.5: NOT A NOUNER

In an informal experiment one can easily do, I asked a six-year-old child to show knowledge of *–er*. (Morphology always seems funny, so this game is good for a laugh):

a. If you sing, you are a ….singer, right?

b. if you run, you are a …

c. if you jump, you are a ….

d. if you play baseball, you are a …player (or baseball-player)

e. if you wash dishes, you are a …washer (or dish-washer)

f. if you use a knife, you are a….

and the child smiled and said "not a knifer"

Caption: "-er" does not freely attach to nouns

He did not have the wherewithal to form *knife-user*, but he seemed to know that a noun is not an ideal basis for an *-er* word.

Extension:

You can keep going and see how far the child will go (or try it at a party):

g. if you always seem happy, you are a ….

?happy-seemer

h. if you always appear angry, you are an

?angry-appearer

i. if you always do nothing, you are a….

?nothing-doer

j. if you wear everything, you are a…

?everything-wearer

k. if you help yourself, you are a…

self-helper/?yourself-helper

l. if you help me, you are a….

?you-helper, ?me-helper

m. if I help you, I am a….

?me-helper, ?you-helper (NN9)

Our game reveals some other compound limits: we cannot put personal pronouns, or quantifiers, or negatives inside compounds. Children around the age of five or six years resisted just those forms.

Would a child never put a pronoun inside a word? Kathy Hirsch-Pasek told me of a child who kept asking to go to "Accu." Where is that? Finally it became clear that the child meant the Acme Hardware store, but thought that the name changed with the person ("Accyou"). (Likewise, Barbara Pearson tells me that many children in Miami wonder where "Your-ami" is.) The challenge for the child is often not the basic rule, but seeing the hidden factors, the invisible features of grammar, that determine where it applies.

If one tries this game with friends, the machine may take over and generate *happy-seemer*, but everyone will be smiling with the awareness that it is not quite right. The smiles have more than humor behind them. The fact that we can say *happy-seemer* shows that we can define a pure syntactic engine that can ignore the semantic constraints overlaid on the rule. If we can take apart the parts we have evidence of what those parts are. It is as if we pulled the motor out of a car and watched it run by itself.

Counter-example-collectors

The reader is probably brimming over with counter-examples already. There are plenty: *sinker, New Yorker, homer, boater.* The *sinker* sinks and is not the agent. Our system needs to allow these to exist and, somehow, equip the child to know that they are exceptions, idioms really. Their meaning is so narrow that they are more than the sum of their parts. A sinker is an anchor or a baseball pitch, nothing else, not "anything that sinks." A broiler as object is a chicken and nothing else. If you say you are broiling in the sun, you don't suddenly call yourself a "broiler."

So now the rule is: if no verb is present, the word is an idiom that calls for real-world knowledge beyond just putting together the parts. It is all right to put *–er* on a noun, but we must immediately look for the extra meaning. "Detroiter" could mean someone who made Detroit, or was made by Detroit, or loves or hates

Detroit, or just someone from Detroit, which seems right. A "New Yorker" can attribute a style to a person, but calling someone a Detroiter does not (unless perhaps we are talking about cars).

It is such a system the child acquires, not simply the idea that *–er* can be an Agent. The child uses this knowledge to know what an exception is. If a rule is very sharp, it defines both what lies inside it and what lies outside of it. This concept will be important when we tackle dialects and grammar variation.

Addable Agents

The power of the verb controls not only morphology but the preposition system. The same arguments hold for *by* as for *-er*. Agency gets added onto verbs via *by*, only if the verbs are willing:

the apple was dropped by the boy.

In general, the *by*-phrase seems almost promiscuous in its uses. Here are five kinds:

the project must be finished by me by hand by design by noon by the pond

It is really quite surprising that we do not have unique prepositions for time, place, manner, instrument, but allow the same preposition to be used for all. Would it not be easier for a child if each function had a word?

Clark (NN10) reports that many children often substitute *from* if it has a source interpretation: "birds are scared from wind" or "I took my temperature from the doctor" or "those fell down from me." Such children must know that the *by*-phrase is not allowed on active, transitive verbs and therefore choose *from*.

Nevertheless, the Agent reading is never <u>independent</u> of the verb for adults. We cannot say:

*the crop died by the farmer

meaning that the farmer caused it, we can only mean a location, "next to the farmer" (which is not very plausible here).

Some verbs have two versions, with and without agent:

the navy sank the boat

the boat sank

We can capture this relation as an operation: The object moves to the subject, which <u>cancels</u> the Agent role: someone sinks boat => boat sinks. Because it has

been cancelled, the Agent is prohibited from sneaking in the backdoor through a *by*-phrase, as this ungrammatical sentence shows:

*the boat sank by the navy

We do not just add an agent where we want, but only where the verb allows it. This should be no surprise since we found that *–er* was a projection from the verb as well

Adjectives have no verb, so despite their agentive force, they uniformly block *by* though the meaning is quite plausible:

*John is angry by mother (Mom angered John)

*John seems happy by a surprise (a surprise pleased John)

Now if the acquisition path is parallel to –er, we are led to a prediction:

Children will allow by-phrase to be a freely addable agent.

In fact a few spontaneous examples exist like:

“it fixes by glue” (NN11)

looks like a case of this kind, though here the *by*-phrase really seems to be taking an instrument.

If we take a sentence like:

The ball was rolling right by Bill

we know that it is not an agent and even if no *right* is present, the agent reading is not correct because the active verb only projects the Agent onto the subject.

In a large experiment, children were shown one picture in which a child drops a plant and another where a plant was dropping from a window next to a boy. Then we asked them to point to a picture:

The plant is dropping by the boy.

A number of children take the Agent reading, allowing the *by*-phrase to be an agent where it is not licensed by the verb. From data on 1450 children from 3-12, (NN12) we found that with older children, allowing the agent reading was associated with more general language difficulties. Here is a simple way to see how independent the *by*-phrase is for a child.

EXPLORATION 6.6: **AGENTLESS VERBS**

Situation: Roll a ball by a child and say:

"did the ball roll by me or did the ball roll by you"

If they take the you meaning, they recognize that this construction takes a locative *by*-phrase and not an explicit agent. Otherwise they could point at the roller as the agent. Other verbs and objects will work too of course ("slide by me or you," "walk by me or you," "move by me or you").

We should get both options if we just use the passive:

"Was the ball rolled by me or was the ball rolled by you? "

There is an ordering of the locative before the agent which grammar imposes as well, so we could go a step further and ask:

"Was the ball rolled by you by me or was the ball rolled by me by you?"

This should show how agents come last, after locatives. (Sometimes one can reverse order with a strong intonation.)

Caption: "by" = Agents with passives/ "by"= Locatives with actives

Scraping by

Agent *by*-phrases are blocked from other structures too. Instruments cancel agents just like objects do. Therefore we cannot say:

*a scraper by John

*a toaster by the cook

*a lawn-mower by Bill

novel: *a door-cleaner by Fred

Locatives outside of compounds are rare (*forker), which suggests that those which exist are idioms whose verb is no longer alive. That is why "a toaster by the cook" cannot have the cook modify the inner verb "to toast," but only possibly be the creator of the toaster.

We would predict that the child who errs in the examples above would also err in treating the *by*-phrase as freely designating an agent even without a verb.

EXPLORATION 6.7: INSTRUMENT OR AGENT, NOT BOTH

Setup: use a scraper (say on a wall) and put another scraper right next to you, then ask:

"Can you point to the scraper by me?"

Which scraper will you get? Adults will give you only the one that takes *by* to mark a locative.

Caption: Unambiguous "by"

Subtractable Agents

The reality of grammatical principles is most powerful precisely when they have invisible consequences. Agents are often invisibly present. The so-called "agentless passive" is really the opposite of its name—it keeps an "implied" agent alive, as this contrast reveals:

the apple dropped

the apple was dropped

In the former there is no agent and in the latter there is an implied agent. Children create some very personal passives where another agent is implied, like my daughter's: "I don't want to get waded" (= wade into the waves with an adult).

The implicit agent is still alive if the passive turns into an adjective before a noun:

the dropped ball

there is an implied agent, which forces the mentioned noun to be the object, as in:

the pulled dog

We tried a little experiment and found that most five-year-olds will give us a clear distinction between:

the pulling dog/the pulled dog
[Add pictures?]

introducing an implied agent for "the pulled dog."

EXPLORATION 6.8: DRAWING CONCLUSIONS BY DRAWING

We asked another group of five- to seven-year-olds to draw "the pulled dog" and "the pulling dog" and 23/25 had no difficulty. It is an easy technique to pursue:

Draw for me:

the watched bird/the watching bird

the pushing truck/the pushed truck

Caption: Implicit and overt agents

We also asked them to illustrate the difference between:

Show me the stick, breaking

Show me stick-breaking

where the latter has an implied agent (and the former is ambiguous), and we found very clear evidence of this knowledge. Here is what we got:

Insert Pictures from Mechanisms of Language Paper

Such explorations are a perfect but under-utilized experimental technique. Drawings proceed entirely from the imagination of the child. (Note that one might ask children who can draw to draw many of the explorations in this book, and it is

bound to be revealing.) In any event, the presence of implicit agents here is incontrovertible.

Another affix *–able* has an implicit agent and children often fail to see it. One child said to me "don't tickle me, I'm laughable" while another said "the queen is captureable" (meaning the queen can capture) and a German child said "Ich bin nicht schlafbar" (I am not sleepable). (NN13)

EXPLORATION 6.9: "DON'T TICKLE ME, I'M LAUGHABLE"

In experiments we have shown children the following sentences (see Val Johnson for extensive discussion with nonsense words (NN14)):

the elephant is pushable

with one picture of an elephant getting pushed and one where the elephant does the pushing. Many children take the elephant as pusher.

Caption: "-able" and Object

It is not really surprising that children would acquire the meaning of *–able* without realizing that it involves a necessary subject = object connection. It is not the case that they will misunderstand "the milk is drinkable"; they simply allow a more abstract reading where the subject can be either Agent or Object.

Extension: This is clearly doable in an informal way. One simply needs to take an animal that pushes a truck and then say:

[dog pushes truck}

Was the dog pushable just now?

The child with a secure grammar will say “no” or “yes” and then do something like push the dog with the truck.

Or just put out a dog and a truck and say:

Show me how the dog is pushable.

Then whatever the child does, ask “why?” and the answer is sure to be revealing.

Anti-agents

One interesting formal property of grammar is negative implications. If something can be marked [+Agent], then our system suggests that it can be marked [-Agent] too and the child has the negative property as an automatic option to look for. In fact there is an affix—-probably beyond any young child—-which does that and is productively used in science *–ant* [coagulant, intoxicant, reactant, etc]. We discuss it briefly to show again what the endpoint of acquisition looks like.

We can see it in our language in cases like:

descendant

*he is a descendant of the mountain

he is a descender of the mountain

or contasts like:

penetrator of our defenses

*penetrant of our defenses

which can occur in a compound:

skin penetrant

The *–ant* affix implies non-agency in a very subtle way. Thus we have servants in the house but a server for wine (or for a computer). In other cases we find:

cooler/coolant

stimulator/stimulant

The difference is always present, but it is extremely subtle. Terms like:

contestant applicant immigrant

all imply that the person's fate is not entirely in their hands. That must be why, as well, we have students and not *studiers. If the child has [-Agent] in his repertoire, then it helps delineate such fine distinctions, though the *–ant* affix might be a piece of grammar that only emerges in high school.

Agent Creation

We have hardly discussed the most basic form of AGENT. It is a projecton from the verb to Subject position. There is a big difference between:

"John hit Bill" and "Bill hit John"

precisely because the Agent is not freely projected in syntax, but aimed at the subject position. This projection is so powerful that child development researchers have often assumed that the child begins with the notion

Subject = Agent

but it is clear from very early sentences that children allow other roles in the subject position in such simple sentences as:

it is nice/it rained/it fell

Some (NN15) have thought that children assumed a kind of hidden agency for sentences like:

the boat sank

But simple expressions like *it rained* make such an assumption very dubious. Does the rain decide to drop itself?

Would a child ever invent exotic sentences? Creating Agents around new verbs have produced some of the most delightful examples of the power of grammar, the power of children, and the power of creative imagination, all working together (gathered by Eve Clark (NN16)):

I broomed her (2.7yrs)

I'm souping (2.4yrs)

Mommy nippled Anna (2.11yrs)

I'm gonna lawnmower you (3;6)

I guess she magicked (=disappeared 3.3)

Don't vacuum-cleaner in the backyard (5.3 yrs)

These are commonly reported, but decline as children get older.

They are more than cute, though; they reveal the third prong of our predictions. We found spontaneous *–er*, spontaneous *by*-phrases, and therefore we should have spontaneous subject Agents as well. That is exactly what occurs in those examples: *to lawnmower* is made a verb so it can have I as an agent subject.

Such examples tells us something deep about the acquisition process which we still do not know how to formulate perfectly. The child is able to link the Agent to a structure freely, before its range of projection comes under the full control of existing verbs. The recognition path goes something like:

Recognize verbal meaning with verbs.

1. jump = action
2. VERB => Syntax = Subject (Agent) VERB

   <======= AG =

   (verb projects agent onto subject)

3. VERB => Morpology = VERB+ *er*

   =AG

   (verb projects agent onto *–er*)
4. VERB => Optional Syntax = Prepositional Phrase

VERB => VERB *by*-phrase

=AG

(verb projects agent onto *by*-phrase)

An act of projection takes part of the meaning of the verb and sends it somewhere. Children first realize how agents are marked, then they restrict agents to verbs that have them. It is the act of restriction which is the machine indicating what is operating and what is not.

Here is a loose analogy. If you were trying to figure out what a car is and you first determined that it had five wheels, all identical. Then, looking for a mechanism, you saw that only four were turning, the other is a spare. It is the latter moment when you really see the mechanism, even when there is misleading information around.

Are there any fifth wheels? Actually we have been buzzing about quite a few: *-ist*, *-eer*, but also *–or*. There are also potential morphological analyses we have not really touched. Will the child secretly wonder if those with power can "pow," or if a cover "coves"? The child must discard numerous misleading possibilities.

If the reader is like me, they might say "oh well, it is just automatic that an action like 'jump' has an agent, so children will have it immediately from universal grammar." Actually, this is just what I thought for a number of years.

It took a lot of examples like those above to show me that the child can grasp the action behind the verb first, then see where Agents are marked, and only then see that the verb does project and determines when and where agents can occur. The projection process is part of the acquisition process and does not occur immediately.

Linked Invisible Agents

The subject link becomes more interesting, as usual, if we just look at more complex structures. Not only are Agents projected to subject position, but sometimes subjects are invisible, as in infinitives:

John started to sing

John is the subject of both *start* and *sing*. Children have no difficulty with this connection. Sometimes, though, if one links invisible Agents, they can be misled. If one says:

to know him is to love him

one cannot mean:

*for Mary to know him is for Susan to love him

It is the same person in both situations. Here is how we this question was explored in a little pilot experiment by Katy Carlson (NN17), which one might try out with a doll and a bowl.

EXPLORATION 6.10: TO KNOW HIM IS TO LOVE HIM

Scenario: "Here is a bowl of cherries. Billy ate them all up. See the bowl has none."

To eat cherries is "to become empty."

Is that right?

Half a dozen children 4-5 years said things like, "yes, he ate the cherries and the bowl got empty," but the children over six years said:

"No, no he became <u>full.</u>"

The second answer enforces a link between the two invisible subjects, but initially children do not seem to make this link.

Caption: Linked invisible agents

Extension: This scene could be easily acted out with a bowl of fruit and a doll or even a child that eats them:

Put cup of raisins before a child and say

"eat'em up"

"They were good, right? To eat raisins is to become empty."

Is that right?

The answers to these questions will reveal if the child requires linking between invisible Agents. If not, they give different subjects to eating and becoming:

For me to eat raisins is for the bowl to become empty

They simply lack the obligatory linking principle for invisible subjects. Other linking principles are overt, as in "John helped himself," but are still not acquired instantly, so it is no wonder that linked invisible subjects take time.

Is there Madness in this Method?

The reader may feel something between awestruck and skeptical: do we have a vision of how acquisition succeeds? Too many notions are coming in from too many odd angles-—Agency is anywhere and everywhere, and that is just Agency. This impression is really right. There must be more of a guiding system that tells the child where to look, more abstract principles of UG that capture variation across grammars. We do not yet see it all clearly. Since so many systems are involved, though, there must be more innate fixed paths, not fewer.

Nor can we rely on general cognition, whatever that is, because it creates too may hypotheses, leads to too many misleading directions.

We have not even begun to discuss all the grammatical variation that can occur, all the options that the child who can learn any grammar, must be evaluating. For instance, in Germanic languages there can be passives of intransitives with implied agents. One can say:

> "there was danced until midnight"
> [*Es wurde bis Mitternacht getanzt*] (NN18)

But intransitive passives cannot occur in English and children do not spontaneously produce them. Why should a child deviate from English with "storier" and not with *"it was sat all day"? No one knows the answer.

Are there some clues to a larger theory in all this intricacy? We find that compounds allow only clear AGENTS that have clear direct objects or THEMES. That is why *store-manager* is all right but **smile-manager* is not (because *smile* is not the object of an action). And it is why we can have *penetrator of our defenses* but not **penetrant of our defenses*.

Instruments and Agents also imply each other. So let us create an implicational system, where one role brings the others to bear:

> Agent, Theme, Instrument, and Intention are unified by an abstract concept of Intentional Action (or Event). (NN19)

We are creating a formal object that, quite obviously, matches something in our minds. In order to act purposefully we have an implicit notion of action and goal—-something beyond a physical reflex response to a stimulus. So the presence of one form yanks in the other. We can actually see it happen.

Compare these two sentences:

> John was unhappy with only one hand
>
> John was lifted with only one hand

Suddenly for lift the one hand can belong to the implicit agent, the lifter and not John. In other words, the instrument was linked to the Agent (even though possibly the one hand could still belong to John).

We wondered if children would see the link. Teng Xiao Ping (NN20) gave children ambiguous pictures:

> Two pictures:
>
> boy with one hand pushes a boy with two
>
> boy with two hands pushes a boy with one

and then asked them questions.

Show me where the boy was pushed with one hand.

Three-year-olds readily chose the picture where the one hand was linked to the agent and not the subject.

EXPLORATION 6.11: INSTRUMENTS CARRY INVISIBLE AGENTS

One can try this easily with household props:

Put two forks on a plate and one fork on another plate. Push the plate with two forks using one other fork

Was the plate pushed with one fork? => yes

Was the plate with one fork pushed => no

The implicational system carries a raft of roles (Agent, Instrument, Theme) at once and helps guide the child down the swift river of ambiguity that flows through every conversation.

Caption: The Instrument-Agent implication

Summary: Where's the System?

Now let us step back and see if we can coordinate the system that the child seeks. Such a bewildering array could not be deciphered if there were no stable, innate assumptions guiding the process. We have argued that it begins with these universal ideas:

some verbs have agents

those verbs project agents

Now the particulars of language emerge. The Agent is projected in three ways:

to subject:	John hit Bill
to *–er*:	John is a hitter
to *by*-phrase:	Bill was hit by John

Then two other operations occur. If the object goes into the subject slot, then the Agent is blocked, that is why we cannot say:

*the ship sank by the navy

and if any other operation occurs (compounding, passive) the Agent simply remains implied.

The acquisition path involves:

1. Grasping the *agentive* meaning of the verb
2. Allowing agent projection to *by* and *–er* freely before it is connected to the verb.
3. Elimination of free projections after agent-verb connection.
4. Linking invisible Agents.
5. Allowing other affixes: *-eer, -ist, -ian* to operate where *–er* does not. (That is, one can allow *–er* on nouns as *automatic idioms* precisely because no verb is present.)

The Agent is a part of an Intentional Event which then serves to identify other roles projected by the verb: agent, instrument, theme (and a few others).

What at first seems like an incredibly criss-crossed realm for the expression of agency is actually linked to a very abstract system of projection from verbs. The concept of role-projection and its necessary function in grammar must be known innately beforehand. Then the child must determine just where each grammar projects agents and other thematic roles.

The reader may feel a bit uncomfortable with our use of the term "concept" here, since it does not refer to something conscious. Later we will investigate briefly what we mean by "knowledge." Straightening it out may seem

abstruse and irrelevant, but I think it affects how we appreciate the children sitting right in our laps.

Our array of Agent projections is not yet complete. We need to uncover the Agent within our chief example of recursion: possessives. We will return in a later chapter to asking just what possessives can mean.

Chapter 8: Possession

Let us start our investigation of recursive possessives by asking what "possessive" means in the first place. Countless parents, have reported to me that their child's first word was "mine," sure that it signaled their children's egocentrism and self-interest. Are they right? Does a primitive notion of *possession* reveal their unconscious human nature? Is grammar a slightly abstracted inventory of our emotions, or a metaphor for human nature?

When a child uses an expression like "mine, "*my spoon*," or "Ezra's book" (referring to himself), grammatical and emotional possession seem identical. Children start with the possessive meaning. The emotional sense of possession in "my" is very strong and may provide the child entrance into the less well-defined world of the grammatical possessive. In the grammatical sense, the <u>possessive</u> seems to have no sharp semantic core. Real-life possessives seem to have many possible meanings:

John's picture

= picture <u>of</u> John, pictures <u>by</u> John, pictures possessed by John.

But not all meanings are possible. One child tried: “I need my help” (= I need someoneone to help me). This goes beyond the meaning encompassed by this possessive. What grammar constructed it for the child, and why is it not right for an adult?

For “John’s picture,” we have: object, agent, possessor--all covered by the possessive marker in English. How about these obviously productive uses that one can easily invent:

John's disappearance

Bill's conviction (belief or criminal case)

Fred's irresponsibility

the drug’s appearance

the city’s protection

In none of these cases does the concept of "possession" apply well. (nn1) In *Fred’s irresponsibility* we have an attribute, not something owned.

The city does not own its destruction. Terms like “possessive” may be more harmful than helpful in making grammar transparent to everyone. After all, calling someone “possessive” is not exactly a compliment. (Of course, the case label “accusative” is not very friendly either).

Maybe any association works (as has been suggested). But that is not true. While we can go from

the photo of John to John’s photo

we cannot go from:

“(do you like) the idea of lunch?" to:

“(yes, I like) *lunch’s idea.”

Here again we bump up against subtle linguistic knowledge which is never conveyed in school. Do children, who generalize madly, and easily say:

a piece of cake

occasionally say:

*a cake's piece

*a people's group for a group of people

*tea's bowl for a bowl of tea

*brick's house for a house of brick

Not one example like that has ever been reported (to my knowledge), but the child might still comprehend a possessive that way. After all children say funny things like "my did it" and adults do not.

We can see that anything doesn't go. Some kinds of association are sharply ungrammatical for the adult: genitives cannot carry the notion property or made out of. All the indicators are that this is a restriction that does not have to be learned, but children still might mis-analyze the construction in ways that mislead them. It is time to dive into real transcripts to see what is there.

"That a my did it"

One child from the Galasso corpus (nn2) has been scrupulously followed to determine the emergence of possessives, *Me, my, mine, he, his your, etc.*

Me: I want me bottle. Where me Q-car? That me car. Have me show. Me

turn. Me cat. Me pen. (2;6-2;8)

You: No you train. It's you pen. It's you kite. It you house? (3;2)

Him: I want to go in him house. Him bike is broken. It's him house.

Mine: Mine banana. Mine bottle. Mine car. Mine apple. Mine pasta (2;4)

My: My car. (3x at 2;4) My pasta. I want my key. It is my t.v.

His: What's his name? (3x) (3;6)

your: Where's your friend? It's your car? I got yours. (3;4)

AGENT:

My do it (I) (3;0)

My get it (I) (3;0)

This child obviously utilizes the notion of possession before he masters the morphology to express it. We find *me, mine, my* (and other children say *mines*) all used to express possessive. It is possible that a child who uses several forms simultaneously has slight semantic variations in mind. It is very hard to determine from the naturalistic data just what the range of possible meanings are.

It is clear that Agent readings arise because many children will actually use them with verbs: “my do it.” A famous case comes from Henry Hamburger, (nn3) “that a my did it” which seems like an adult form of “that

was my doing," but actually refers to an object the child made. Spontaneous quotations tell a lot, but they cannot reveal the boundaries of meaning for the child: can all roles appear as possessives? There are many ways to find out.

EXPLORATION 8.1: IS A PICTURE OF YOU YOUR PICTURE?

With a digital camera, each person in a group could take some pictures, be the object of pictures, and then hold a random assortment.

Set up:

1) Put a picture that a child made on the floor

2) Give the child a photo of someone else to hold

3) Hold a picture of the child yourself

Now ask: "show me your picture."

Then continue to ask about each picture:

"Is that your picture?"

[pointing at one a friend holds that "you" took]

"Is that your picture?"

[pointing at one of "you"]

"Is that your picture?"

[pointing at one "your" friend took of someone else]

Which pictures will the child take? Agent = child made, Object = child himself, possessive = child owned. Our prediction is that most child will accept them all, but we do not really know. Since we have an obligation to answer "yes" whenever we can, we should be able to see if the child accepts all three meanings.

Caption: Possessive meanings

Why "Of Mice and Men" and not "Mice's and Men's"?

Is the *of*-phrase just "a genitive on the right side?" In one of my first experiments, (nn4) I got a clue that children's *of*-phrases are not perfectly in line with adults'. We had some barnyard animals that carried out various *-ing* actions, like "show the kicking of the horse by the dog." Then we asked the children to

"show me: the jumping of the fence."

Seventy-seven percent of the children three to five years made the fence itself jump instead of having an animal jump it. This result is somewhat flabbergasting if one assumes that English has subject-verb-object as a fundamental structure. It should make a subject coming after the verb the most difficult thing to acquire. But it is not. There is no simple subject-verb-object template, like a stencil, that a child locks every new sentence into.

(And compounds like “[No more] kitty-chasing” give input to the child that puts the object before the verb, instead of the subject. In fact, many languages, like Italian, express possession after the noun: *the hat of John* instead of *John's hat*, as in Old English *the book of Job*. Will children allow the subject reading for *the picture of John* where adults take an object?

Here's how we explored it. (nn5) We took photographs of a person, identified in a story as "me.” And then showed two pictures, one of someone putting a crown on me (it was in fact me) and one where I put a crown on someone else. Then we asked the children to point to:

a. the crowning of me

b. the patting of me

c. the pushing of me

To our surprise, the Romance option was clearly available. Children between four and five years preferred to have "me" be the agent two-thirds of the time. Is the opposite possible too: object before the verb? The following example suggests that it could.

“I need my help” (nn6)

(The "my" is the object of help and not an agent of help: he needs help.) The free interpretation of possessive is at work. For adults *my help* gets only an agent reading. It is not really clear why. The set of bare nouns derived from verbs seems to share this characteristic: *my push, my kick, my love, my thanks, my dissent*, while those with affixes that can be considered nominal passives easily receive an object reading: *my destruction/my resurrection/my designation as president*. It seems as if a child may have an instant grasp on the more abstract, relational notion behind possessive. The child's grammar then points to part of the solution: the freer possessive is the core version. Restrictions on it must be learned for special lexical items or certain grammars. Let us now see if we can explore these options.

Now let us go after meanings that might be excluded for adults.

EXPLORATION 8.2: PICTURE OF YOU AND PICTURE OF YOURS

Setup: 1. Child has a picture of herself, by herself, and another picture.

2. Dad has pictures of the child and by the child

Say: "Give Mom the pictures of you."

=> just of you (child's and Dad's)

"Give Mom the pictures of yours."

=> of you (child's and Dad's)

=> by you (child's and Dad's)

=> owned by you (child's set)

Will the child allow all of these readings?

Caption: Excluded possessive readings

While children do not spontaneously overextend possessives and say: **the rice's bowl*, it might be that they allow that interpretation. We did a little experiment with four to six-year-olds which one can easily reproduce.

EXPLORATION 8.3: CAN AN OBJECT POSSESS ITSELF? (NN7)

Setup:

A girl named Candy.

She holds a bowl full of popcorn.

Also present: a bowl of candy.

Now if we ask to see:

the candy bowl

the bowl of candy

we should get the bowl full of candy. But if we asked to see:

Candy's bowl

then we should get the bowl of popcorn.

Caption: Containers are not possible possessives

What something consists of cannot possess it. We did the same thing with a girl named Ivy and a wall of ivy, a girl named Crystal and a crystal bowl, etc. One might add girls named Rosemary, who has a bottle of ginger, and Ginger who has a bottle of rosemary.

To our surprise many of the children would point to the bowl made of crystal when we asked for Crystal's bowl, etc. This suggests that the child either does not have the restriction or perhaps does not grasp the possessive – *'s* itself. Maybe they hear "candy bowl" when we say "candy's bowl"?

One might want to show in advance that the child applies that morpheme (not just lexical cases like *my, her, your*) by asking the question:

Whose bowl is that?

And see if we get:

"Candy's" or "crystal's" or just

"Candy" or "Crystal"

At the point where children use -*'s* productively, one would expect them to block the made of reading.

So far we do know that the possessive is not completely free in its interpretation and we know that children do not exhibit that restriction immediately.

Recursive Possessives are Not Agents

How about all those complicated recursive possessives that we marched through in an earlier chapter? Do they all freely allow all these meanings? Let us investigate:

John's rejection of a friend

John's friend's rejection

Now John is not clearly the agent of the rejection anymore-—it seems that someone else is rejecting John's friend. All we know about John is that it is his friend, not John's role in the rejection, which probably does not exist, all that John's indicates is that he is linked to friend, but he has no necessary link to the action of rejection.

In fact we could continue

John's friend's rejection of Bill

and now the friend becomes the Agent, but not John. It is clear that under recursion, recursive possessives (John's friend's rejection) do not allow expression of just any meaning (any thematic role of reject).

This limitation on how recursive possessives refer must follow from something, but what? This question gets right to the root of linguistic theory. Our previous analysis of verb projection supplies the answer here as well:

verbs project their roles nearby

It is the phrase next to the verb on either side which is the Agent or Theme-object. The linguistic term for this is local projection.

Nothing is learned here. The limits on universal grammar allow the child to ignore other cognitively conceivable hypotheses. We are really seeing how the invisible assumptions of mind work. Recursion of possessives is infinite, but the meanings it can carry are not.

The possessive is just the tip of the iceberg in terms of limits on interpretation. If we allow both:

John's creation of Mary

Mary's creation by John

and then form:

John's and Mary's creation

now we cannot have *John's* be the Agent, and *Mary's* the object. The *and* must link not only two genitives, but genitives with the same role in the event (in this case either agent or object). Again, we just "know" this to be true for children as well, from our intuitive sense of what universal grammar allows. We will not develop an exploration to show it, but it would be easy to do.

Movement and Backwards Reference

One of our commitments is to make the endpoint of acquisition ever-present. It defines what it means to be a speaker of English, but it is easily forgotten (even among acquisition researchers). What kinds of complicated knowledge does the child eventually control. Consider this sentence:

Mom has the picture of herself of her friend's.

Most people, with a little thought decide that this sentence is ambiguous. The picture is either of Mom or the friend. There is something strange here,

though. Since the reflexive comes first, how can it refer to the friend? We do not allow sentences like this:

*herself helped Mary.

A basic principle of grammar is that reflexives refer back to an earlier noun phrase. To get the facts right we have to invoke one of the deepest powers of grammar: to move something from back to front. We can take a sentence like:

the friend's picture of herself =>

and move the reflexive forward to have

the picture of herself of the friend's

Then we can see that before movement, in what has classically been called "Deep Structure" the reflexive really did follow the noun phrase. The simple principle is upheld if we allow the power of movement into the grammar.

Now suppose we fixed the connection before we moved the phrase, then *herself* goes to *friend*, but if we fix the relation after we move it, then

herself goes to *mother*. So the child has two possibilities if she puts the reflexive back in its original position:

Mom has the friend's picture of herself

then it refers to her friend. Only if she fixes reference in the front position will it refer to Mom:

Mom has the picture of herself of her friend's

Now let us try to set it up overtly, which should be much simpler for the child.

EXPLORATION 8.4: POSSESSING BACKWARDS

Set-up:

two children involved, one subject girl,

and another girlfriend (or dolls)

Equip the child's friend with one picture of Mom and one picture of the friend herself

Friend holds: Mom-picture

self-picture

Then we can tell the child to take from the friend and give to the mother:

"Give Mom the picture of herself of the friend's."

Will the child take the picture of Mom or of the friend?

Caption: Backwards reflexives and possessives

Extension:

Mom has a picture of herself and another of her daughter. Call her <child's name, here let's say "Susan">.

Mom gives both pictures to Susan.

Now the adult says:

"Look Susan is holding the picture of herself of Mom's.

Which one is it?"

Or suppose the child does not see it,

Say: "Mom gave one picture to Susan.

Susan has a picture of herself of her friend's

Who do you think is on the picture?"

The answer should reveal whether the child takes the surface order of the sentence or restores the deeper order.

When do children grasp all of this? Evidence for clause movement was found in the work of Larry Solan. (nn8) Solan gave children sentences roughly like:

a. Before he jumped, the horse hit the pig.

b. He jumped, before the horse hit the pig.

If we restore *before* in the first sentence to the end, then it is no surprise if *he*=horse (the horse hit the pig, before he jumped). The second sentence (b) forces *he* to be someone outside the sentence. Children four to six can get

the coreference reading for sentences like (a), which suggests that they can understand movement. Will they understand backwards reference for these reflexives? We do not really know.

Conclusion: An Engine at Work

Could a five-year-old say or hear something like this? A teacher might easily say:

I really like that drawing of yours of your mom's car

or:

your friend's picture of <u>one ear</u> of his dog's …is very funny.

Such a sentence has six possessives to unpack in eleven words. A child might guess what is meant, but to control English, they have to be unpacked in a very particular way. The complex structures are not found only in the *New York Times*, they are often present in our language to children (as we saw in the chapter on recursion).

We flew into the web of possessives with a goal: where can agents appear? We find them in both pre-nominal and post-nominal possessives, but not inside the recursive possessive machine. We had to hang onto all kinds of different machinery just to lay out all the variation to be captured: recursion, movement, affixation, verb projection, prepositional phrases,

reflexives, in short the whole of engine of grammar. Every part of a mechanism engages every other part.

Once again more is going on than we can readily explain. Nevertheless what those who work with children can see is that systems come into play that are far beyond any form of overt instruction. Being beyond instruction does not mean being beyond assistance. Exposure to sharp contrasts like those in our explorations is a natural way for children to progress in understanding a system we do not fully grasp ourselves. Still it is important to remember that exposure to what can occur does not prove to the child what cannot occur. For that we must rely on innate knowledge.

Larger Picture

Our larger scheme has three vital ingredients: structure (recursion), meaning (action and event), and operations (movement). The structure is the chassis--like a skeleton, on which is laid meaning, and to which operations apply.

Into this structure are put words-—but the words have their own structure (endings) and they have links across the syntax (reflexives and co-reference). The link between words and structure happens when the child lays the word-structure on top of the verb-structure: he sees a relation

between a verb meaning and ending, allowing some forms (*runner*) and stopping others (**seemer*).

All of this represents knowledge that the child need not acquire. He already has it. If he does not show the knowledge at first, it does not mean he does not have it. If *–er* seems free at first, the child will eventually lay it on the chassis of verb structure, and interpretive limits will pop out immediately. The child lays out little pieces of an engine and then sees where they fit. It is that moment of fitting when the abstract properties of grammar really take effect. Often child meanings or phrases ("storier") are cut out in this process.

But we are still coping with just a tiny piece of the pie. We have not discussed: how we weave in the force of sentences (question or imperative), how we add other systems that ride on the structure, like intonation and case marking (e.g.accusative, nominative, possessive, instrumental, dative). As different parts of grammar are woven in, meaning is added, but also subtracted. For example, "dog see" means either "dog sees" or "someone sees dog." If we say "see him," adding accusative case, we eliminate the agent possibility. Building the grammar causes the child to both expand and restrict his expressive power.

And yet we have already derived dozens of points where this knowledge touches the reality of a child's life and where we can, as we have done, ask questions about what the child knows.

Our discussion has not yet seized upon how languages and dialects can vary---how the child is confronted with choices that force him to acquire one grammar or another. In a sense, we have hardly engaged the acquisition process. Rather we have dwelt upon what lexical items carry and how universals are manifest in what the child hears every day. Much of this must be left for another day.

One place the power and precision of grammar becomes stark lies in how it can be duplicated. We actually have rules that govern the silent parts of language, places where grammar is so exact that we know from one sentence what is missing from the next. We turn next to the question of how a child must learn to structure silence itself.

Chapter 10: On Time

Mysteries of Time

"Now then sleep my child" goes the lullaby, over and over, but what passes into the mind of the child about "when"? Or a parent might say, "Now then, let's get to work." Does the child feel like saying "Well ma, make up your

mind, now or then." What does the child think when a parent, showing a four-year-old a new video-player on Christmas Eve, says something like:

> "now you can play all your videos, but you cannot play them all now, because you have to go to bed soon"

What could two different *now*s or the contradictory "now then" possibly mean?

The answer lies in what we call "logical" *now* that is like logical *then* (found in "if..then" connections). We can easily imagine a parent saying:

> "If you can't wait, then do it now."

Beyond its logical use, *then* has two temporal uses. Compare these sentences:

> a) John ate dinner and Bill ate dinner then too.
> b) John ate dinner and then Bill ate dinner too.

In (a) we have identical time, and in (b) sequential time. Oddly the "identical" time is linked to the final position, and the sequential to the initial. This is surely not arbitrary, though we do not know exactly how to say why it works this way. One clue is that the final *then* is close to the verb

and so may get linked to its time. If the two *eat*s are identical, then their times are identical too. However this seems to be hard for children. They quickly see the sequential reading and say "and then…" but the identical reading comes much later.

How does a child cope with it? It is not clear, but it is not hard to see if a child has it straight.

EXPLORATION 10.1: NOW AND THEN
Give a child new sunglasses <u>at night</u>. Then say:

a) Now you can block out the sun, is that right?

or:

b) You can block out the sun now? Is that right?

Caption: Temporal and logical now

These are a little ambiguous---you can get the other reading if you try hard---but if you ask a series of questions, you should always get the "logical" now more often for (a) than (b).

What is the acquisition path for this array of meaning? It is hard to tell. The child may begin with either the temporal or logical meeting. Maybe they make a connection through moments when both are true.

If we get some ice cream, then we can eat.

could be seen as both logical and temporal. We might think that the child begins with the temporal meaning, but all the evidence of how they learn *well* or *and* or *so* suggests that often the abstract meaning is more immediate. We do not know.

Time Words

Time words are stupendously tricky. Often adults cannot nail down what is meant:

Yesterday John said that he was coming tomorrow.

Does that mean "today," taking the view of John when he spoke, or is it really tomorrow taking the speaker's current point of view? Take another case:

John said yesterday that he came three days ago.

Did he come three days ago or four days ago? If we compute *ago* from yesterday, then it is four.

The stretch of time meant can be obscure too:

At dinner last night John said that Mary was coming soon.

Does that mean in an hour or in three days? Parents often say “don’t worry, Mom will be back soon,” but is that really clear to the child? The child must incorporate contextual information (a shopping list or a suitcase) to know what is meant.

Most of the time, of course, children can ignore these little words and grasp what is going on. In order to be a real speaker of English, though, they must master all of the various meanings of these time words.

What do children actually do? First they avoid using many time words, but later they appear. Deanna Moore (and Mary Ann Walter) found these examples from children whose grammar was otherwise quite advanced, long after past tense appeared:

"I missed you tomorrow"

“Can we go bowling tonight like we did tomorrow"

“Lisa come there tomorrow today”

Child: "Remember that ball we got when you played softball tomorrow"
Mother: “you mean yesterday”

Child: “yeah, yesterday tomorrow”

One wonders what the children are thinking. If “now then” means something, why not “yesterday tomorrow”? Though their moorings in a fixed meaning is insecure, children seem to have some abstract notion of these time words. Perhaps they all mean emphatically “not today.” We shall see that time inside grammar, not time vocabulary, is no simpler.

“John said that the Yankees played the Red Sox tomorrow”

Have you, at a party, ever said "what did you say your name was?” Everyone answers with their current name, understanding "what my name is" (even if they did marry and change their names). They don't say to themselves "did they want my old name or did I change my name?" Have you heard someone say: "I didn't know you were over 6 feet tall" (you mean, I am no longer over 6 feet tall?), or someone say to a child “I didn’t know you were four-years-old!” (I have never heard a child respond “No I still am four years old.”) Or even into the future:

“You said that the Little League played tomorrow”

This is a strange property of English that is not found in most of the languages of the world. It is called “sequence of tense” and it means that the tense in the first clause is expressed in both clauses. How and when does a

child get it? Do everyday examples like these put a cloud over the acquisition of all past tense forms? They are in the surface of language that every child must cope with.

Let's look at a few examples:

> "Johnny said he wore a hat yesterday and today he is wearing shoes."
>
> "What did Johnny say he was wearing?"

An adult would answer: "yesterday a hat and today shoes." Why do we include the "is wearing shoes" part as an answer to "did he say was wearing"? We can easily say:

> I am wearing a hat. And I just told you that I was wearing a hat.

In sum, "did you notice that I was wearing blue" means the same thing as "did you notice that I am wearing blue." This happens constantly.

> Bart Hollebrandse has intriguing evidence that Dutch children allow sequence of tense interpretation to go into the future. (nn1) Consider this threesome:

"yesterday I was reading a book, today I am reading a magazine, and tomorrow I will read a newspaper."

"What did you say you were reading?"

If one takes *was* to be referential, then "book" is the only answer. If one allows the present to be included, then "book" and "magazine" are acceptable, and if the future can also be included, then all three are all right. Children, interestingly, with experimental sentences somewhat like these, allowed the future as well. Together with Ayumi Matsuo, they showed that Japanese children did the same. (nn2)

It is easy to probe a five-year-old's mind on these questions. I have done it many times and not one child has even blinked.

EXPLORATION 10.2: WHERE IS TIME?

Yesterday I wore shorts, and today I am wearing long pants

"What did I say I was wearing?"

"Long pants" is a more likely answer than "shorts."

Caption: Past as present

The seemingly contradictory subtleties never seem to end. They create a maze that continues to bewilder professional linguists. One thing is sure: children rarely seem bewildered. So they must have a direct unconscious route into these features of grammar. Linguists continue to ponder what the exact limits on sequence-of-tense might be. Let's follow the trail a little.

A large proportion of sentences, looked at carefully, are infested with utterly confusing references to time. Here is a famous one from current discussions (nn3 Ogihara):

John wanted to eat a fish that was still alive.

One might think that "was alive" means dead, but speakers of English know that it means exactly "is alive." The tense moved from one clause to another.

What principle lies behind this phenomenon? At the root, it is the same notion of an <u>invisible link</u> that connects nouns and pronouns in sentences like:

Every boy thought that he was the tallest.

[every boy = he]

The *he* is linked to each boy separately, and sequence of tense seems to come along too (he was the tallest = he is the tallest). (Maybe something links them both at once, but so far theoretical research has not been able to state with precision what it is.) We can say (oversimplifying): Grammar and discourse have a time map that relates all times to each other. One operation is to copy one time in the position of another. The notion of "copying" comes up more often, as we shall see shortly.

Copying Time Backwards

Now let us take potential confusion to the ultimate: we can also copy tense backwards.

Forward: John said that he was tall =>

said [+past] => is [+past] = was

time = > copy of time

Backwards: I didn't think you had a hat

= I think [present] you didn't [past] have a hat = >

didn't [think] < == didn't have

copy of time < == time

(That is, the time is copied backward. Note that the "not" in the sentence is also represented in the "wrong" clause.)

In the backwards case, the sentence does not mean that some time in the past you failed to think, but rather that right now you think that something in the past was not true. So the past and the negative in the lower clause, moved backwards to be marked on the word expression I think => I didn't think.

A teacher of English pointed out that this often leads to errors among Second-language (L2) learners: (nn4)

"I didn't hope it would rain"

really means: "I hoped it wouldn't rain" and the Negative and Past hopped up to the higher clause. Clearly the L2 learner got the idea, but applied it too broadly to all thinking verbs.

As is so often the case, children show us that they have the rule, even if they do not know exactly where it applies. Consider this remark, noted by Rick Cromer from a famous corpus of Adam: (nn5)

"Was this is the boat I saw"

I have been puzzling over this sentence for 25 years. I mentioned it as a cute mistake for a long time. It was difficult to really focus on the possibility that an abstract rule was involved. Only recently could I see that the child had done a similar backwards-tense-movement rule: he moved the past on *saw* up and copied it on the question word *is*. That kind of copying with auxiliaries happens commonly in child language:

"can I can sing"

"Is Tom is busy"

"did he didn't come"

"do you don't want to go outside"

"Long-distance" copying is not so common for auxiliaries. But again, long-distance relations are common as we have seen over and over again. Thus we can have:

What did you say Bill said that Sue intimated that Fred wanted (_)?

But now the moral emerges: most "mistakes" are an example of a rule that a child has made too abstract. The ingredients tense-movement, copying and

long-distance are found elsewhere. The child just put the abstract ingredients together in a novel way.

The real challenge then is to see how a particular language uses these ingredients to create just the right rules that belong only to that language. Let's see if we can trace the connections. The child must learn to constrain the rule to a smaller domain. Here the rule for the child is:

> Tense Rule: you can copy tense from a lower clause to a higher one

In contrast, the adult rule incorporates what we can call "barriers to copying or movement" that prevent what the child is doing:

> Tense Rule Barrier: you can move or copy a tense from a lower clause to a higher one, but not from inside a relative clause. (nn6)

(The concept of "barrier" is important in grammar and acquisition and has been the topic of a mountain of research.) The child has moved the past tense from inside the relative clause (the boat that I saw) to mark a question-auxiliary, jumping over the present tense *is*. Adults would not do this. But we do have a similar construction: (nn7)

What John was saying is that Bill was tall.

Here we have a sequence of *was*, *is*, *was* in which the second *was* is a copy of the first *was* which, via our grammatical powers, was able to jump over the *is* in-between. How do we know? Because the assertion is that Bill is tall and not that he was tall. But how does the grammar get there?

Tense Dance: Forwards and Backwards

Here's a quick tour that will feel incredibly strange and implausible as I present it. It should have the same feeling of implausibility that one might have if I suddenly show you a carburetor and tell you that it makes your car run. The sentence involves both forward movement and then backwards movement of tense.

Here are the formal operations that the grammar needs to do it. It involves creating a presentational sentence on top of a sequence of tense sentence:

Start: John was saying that Bill is tall

a) copy *was* onto lower clause (Bill was)

John was saying that Bill was tall.

b) add " It is that " at the beginning

It is that (John was saying that Bill was tall)

c) Changed *that* to *what*

d) Move first clause to replace "it" :

“what John was saying is that Bill was tall”

That quick tour probably leaves the reader breathless, but it should be no surprise if we accept that grammar involves a mechanism with many hidden parts. This process should seem as alien to you as a picture of your liver (or as we said, a car's carburetor). There is no way to unpack such a sentence without alluding to a sequence of unconscious psychological events. Seemingly anomalous sequences by a child like “was this is the boat I saw” stop boggling the mind once we identify the system behind it.

Beyond Our Time

We have barely touched the real edifice of time in grammar. (nn8) We showed how past tense acts strange, but we have not said how children coordinate, past, past perfect, future, future perfect and the other concoctions grammar has. Little is known about just how they are acquired.

The reader who has been drawn into our method can see that there is much to be done. How, for instance, does a child know the difference between:

He had an umbrella.

He had had an umbrella.

The challenge would be to think of a situation that pulls the meaning apart where a child can be asked a yes/no question. Our brief visit to Tense will not be our last. We return to the topic when we consider dialectal variation.

Summary

This chapter has focused on time but it has repeatedly alluded to the heart of modern grammar: discontinuous dependencies---things that have invisible links. The child hunts wherever he can—among nouns, negatives, tense, questions---for invisible links within sentences. The links are manifested by something moved, something copied, or two things being the same (noun and pronoun).

Let us make a little list:

Noun-Pronoun: every boy thinks he

Tense morphemes: John said he was five feet tall.

Negative morphemes: He don't got no socks.

Movement: what did John buy___

The child is always looking for these invisible links in every grammar in the world. It is, like recursion, part of the essence of the human language machine. What we can see here is that it is an active process of looking and invention, based on small hints. The child is inventing grammar as much as discovering it.