A Minimalistic Introduction to Minimalism

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Outline

1 Purpose

2 Late TG

3 On to Government-Binding

4 Early Minimalism

5 Later Minimalism

6 Ingredients for MCB

The Goal

1. The goal of this presentation is to get from late-ish TG, roughly, ‘Remarks on Nominalizations’ (Chomsky 1970), which nudged many people to ‘Lexicalism’ in the Linguistic Wars, to the recent flavor of Minimalism that seems to lie behind MCB, just enough to understand how what goes on there could have anything to do with generative grammar.
2. I am not a Minimalist, and have not followed it closely, so this will be very sketchy and not deeply informed. Also prepared rapidly. Corrections appreciated.
3. A separate reference list in the course Resources folder will provide some more things to look at.

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A Historical Split

1. The path to Minimalism begins with Chomsky (1973) ‘Conditions on Transformations’
2. Some loved it, but not everybody “What we need is Remarks on Nominalizations *without* Conditions on Tranformations” – Susumu Kuno to Arlene Berman, shortly after the Conditions draft began circulating in summer 1971 (iirc).
3. The admirers took up Government-Binding when it appeared in 1981, and moved on to Minimalism when it appeared in 1993. (‘Mainstream Generative Grammar’)
4. The dissenters went into numerous ‘Alternative Generative Theories’ (GPSG, LFG, HPSG, Categorial Grammar . . ., or semi-generative approaches of various kinds (Role & Reference Grammar, Relational Grammar, . . .

But What Was at Stake?

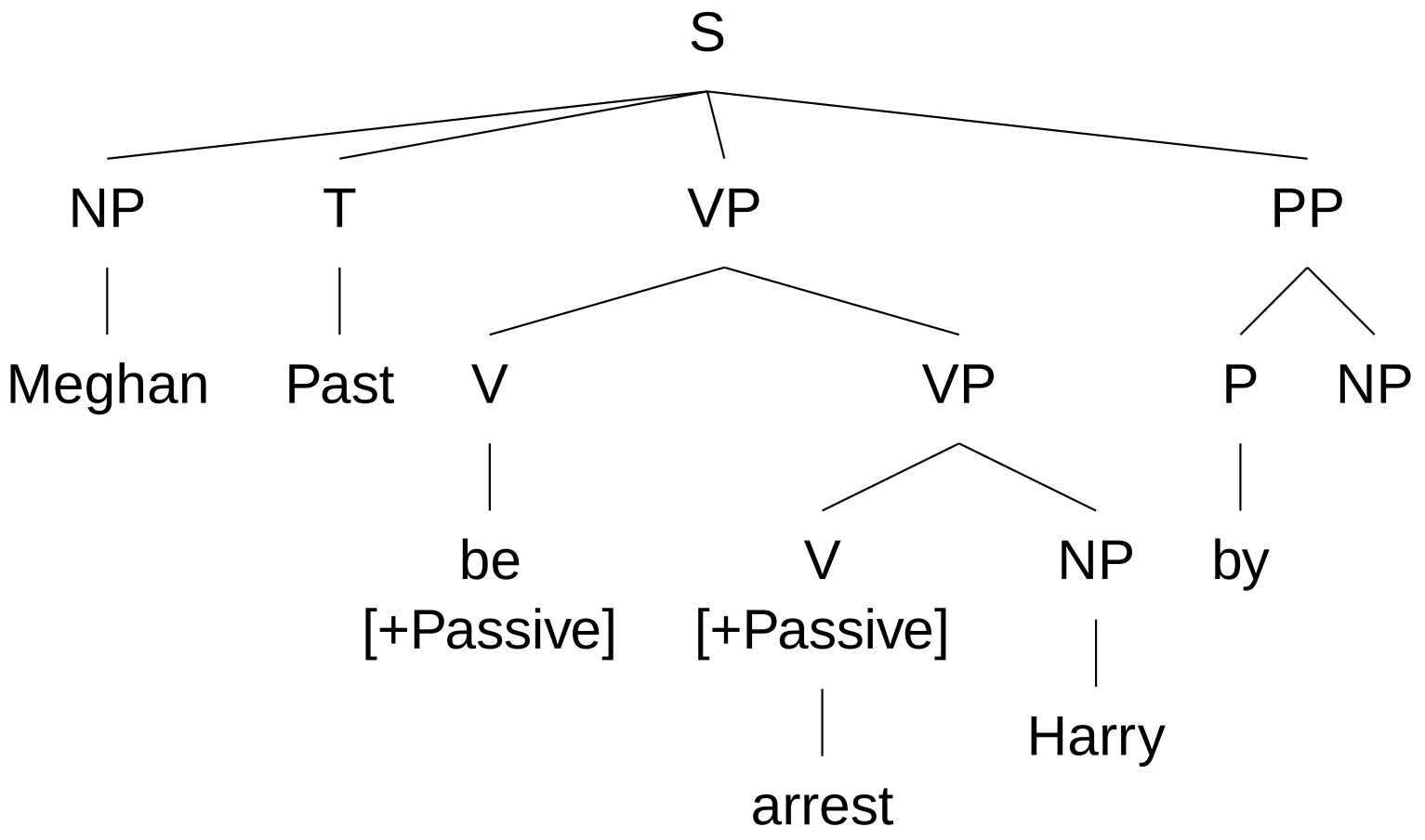
1. That where as a split here seems pretty clear to me.
2. But exactly what it was about is not clear at all
3. Because, so far, reviewing the contents of the two papers, the differences are much smaller than I had (mis)remembered
4. 2 Classics, the textbook by Culicover (1976), and the anthology Culicover, Wasow & Akmajian (1977).

Common Elements

1. Phrase structure rules produce moderately abstract Deep Structures, which were somewhat modified by transformations, such as ‘Passive’, responsible for accounting for passive voice sentence such as *Harry was arrested by Meghan*, where the usual semantic roles assigned by the verb ‘arrest’ are changed from what they are in the active version.
2. To simplify the transformations, extensive use was made of ‘empty nodes’ into which things could and indeed had to be moved by transformations, in accord with the ‘Structure Preserving Constraint’ of Emonds (1970)

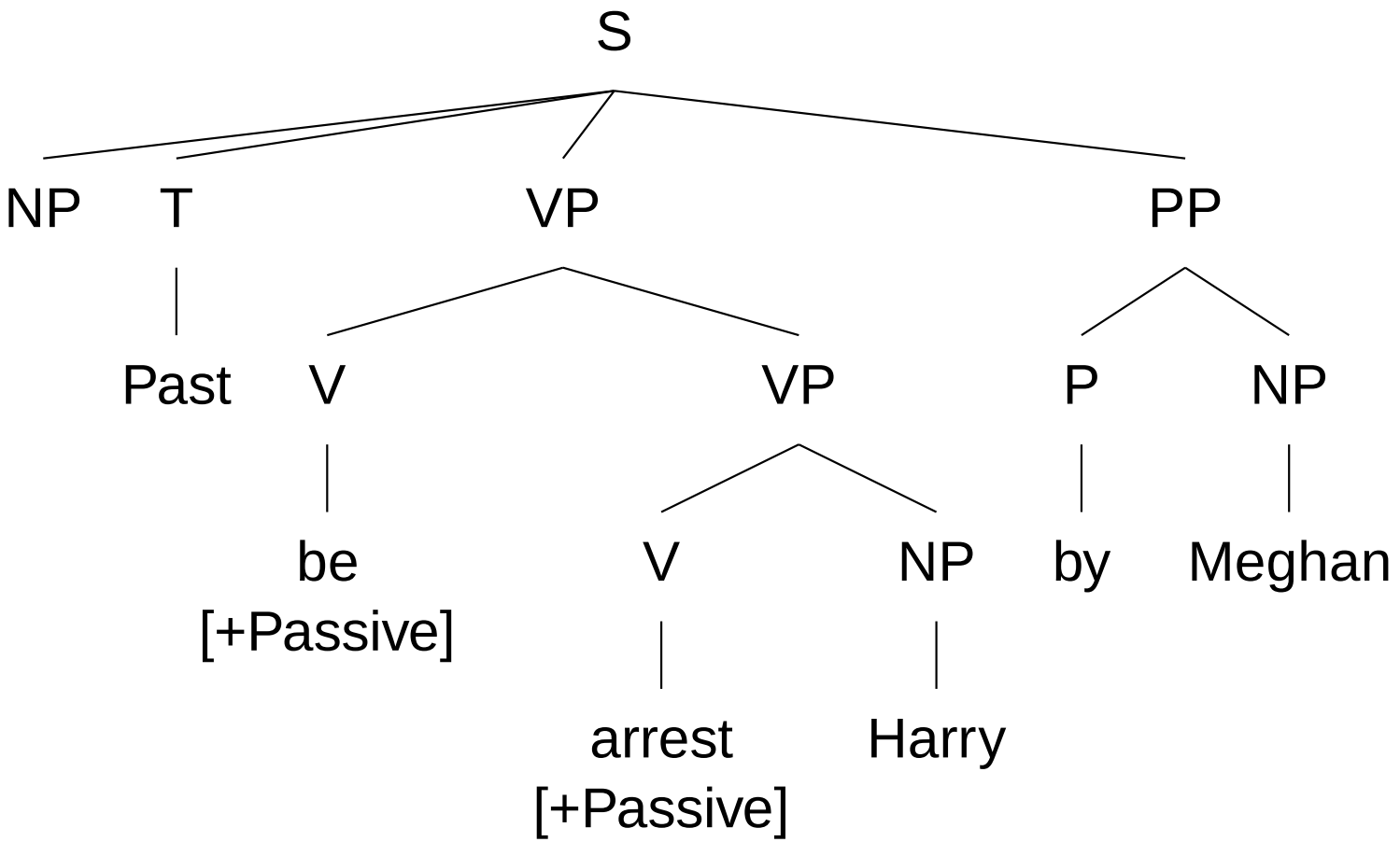
A Deep Structure

1



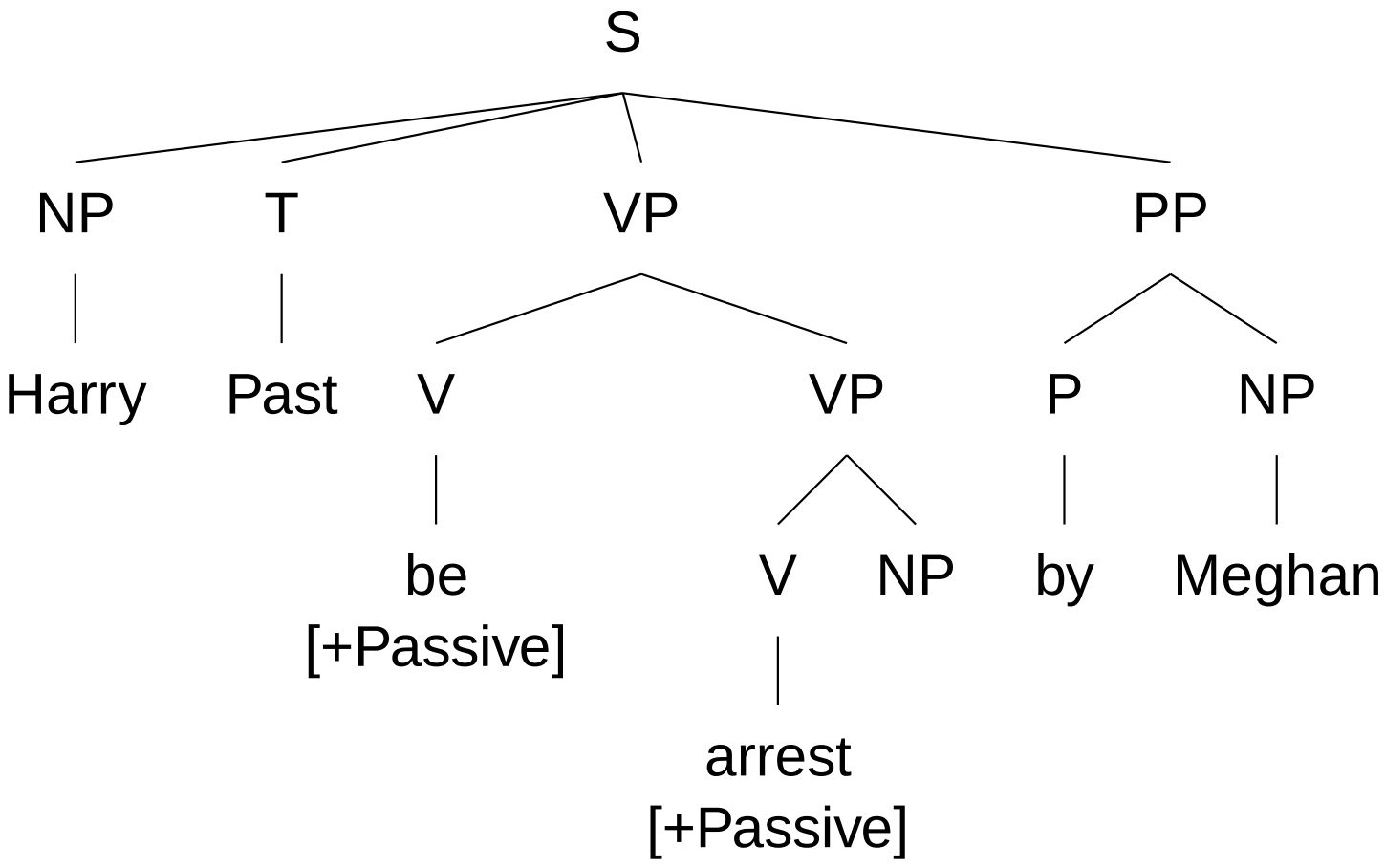
Agent Postposing

1. NP X [+Passive] Y by NP
   1 2 3 4 5 6 $\Rightarrow$
   $\emptyset$ 2 3 $\emptyset$ 5 1

2. 

Object Preposing

1. NP X V NP
   1 2 3 4 $\Rightarrow$
   4 2 3 $\emptyset$

2. 

A Critical Factor: the Displacement Property

1. The ‘Displacement Property’: sometimes, NPs appear some distance removed from the locus where their semantic roles and sometimes other properties appear to be assigned:
2. Which destination (do you think) they finally decided on?
3. Headway seems to have begun to be made on that problem
4. Þeim virðist hafa verið bjargað frá fjallinu
   They(D) seem(3sg) to have been rescued from the mountain
   They seem to have been rescued from the mountain (Icelandic)
   bjarga ‘rescue’ takes a dative rather than a accusative object. This is preserved under 2 iterations of movement in the Conditions framework. (Thráinsson 2007)

Properties of Displacement

1. The hard-to-get-of aspects of Displacement seem to inhere in ‘movement up the tree’, which could take things unbounded distances.
2. But Agent-Postposing was much more local, and easier to replace with a rule of semantic interpretation, letting Agents be expressed either as subjects or as *by*-objects.
3. The earlier AGT’s struggled with Displacement; the first that didn’t was LFG, hence Andrews (1982).
4. Chomsky still talks about Displacement (and, afaik, invented the term), and it is the motivation for including ‘Internal Merge’ in the theory.
5. I think current Minimalism/MCB would probably work with the case-marking example above, but there are further issues involving agreement where this is less clear.

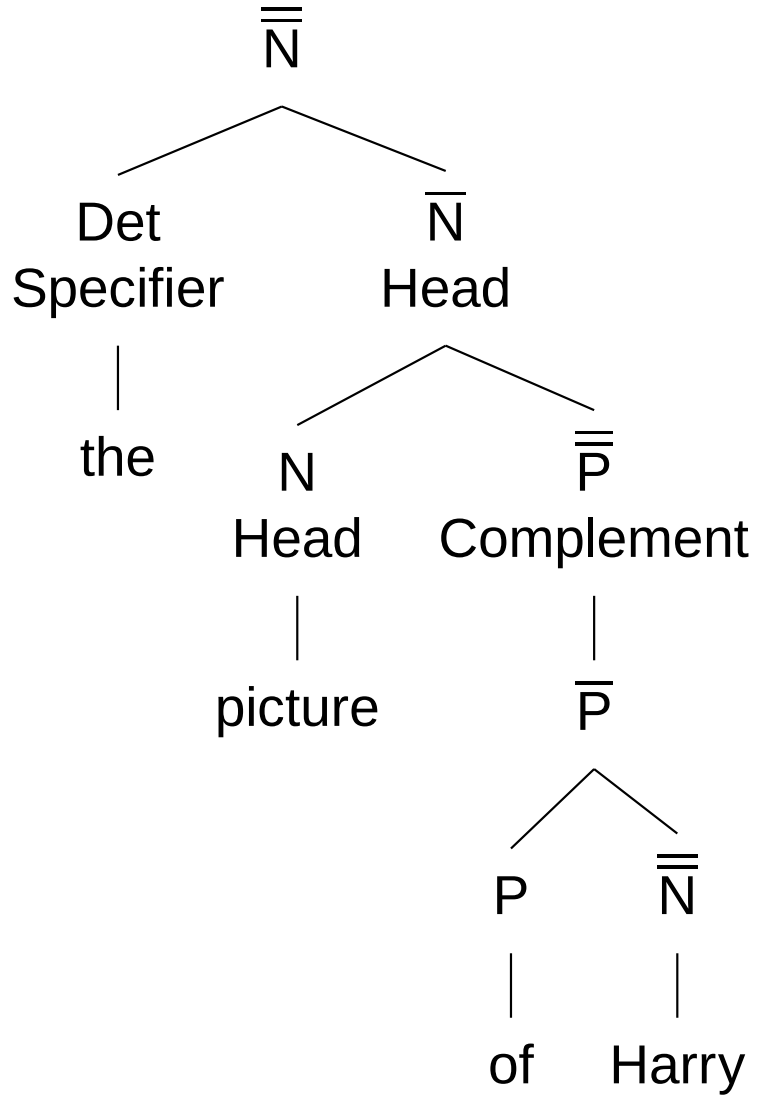
X-bar Theory

1. Phrase-structures seemed considerably more uniform within and across languages that would be predicted by a ‘raw’ PSG notation. For example, people were talking about ‘noun phrases’, ‘verb phrases’, ‘prepositional phrases’ etc, obeying regularities such as ‘complements appearing before heads’.
2. Chomsky (1970) X-bar theory, essentially proposed by Harris (1946) as a solution.
3. Node labels were to be reconstrued as feature complexes, including ‘category features’ such as N and V, and ‘bar level’ features.
4. Category Features:

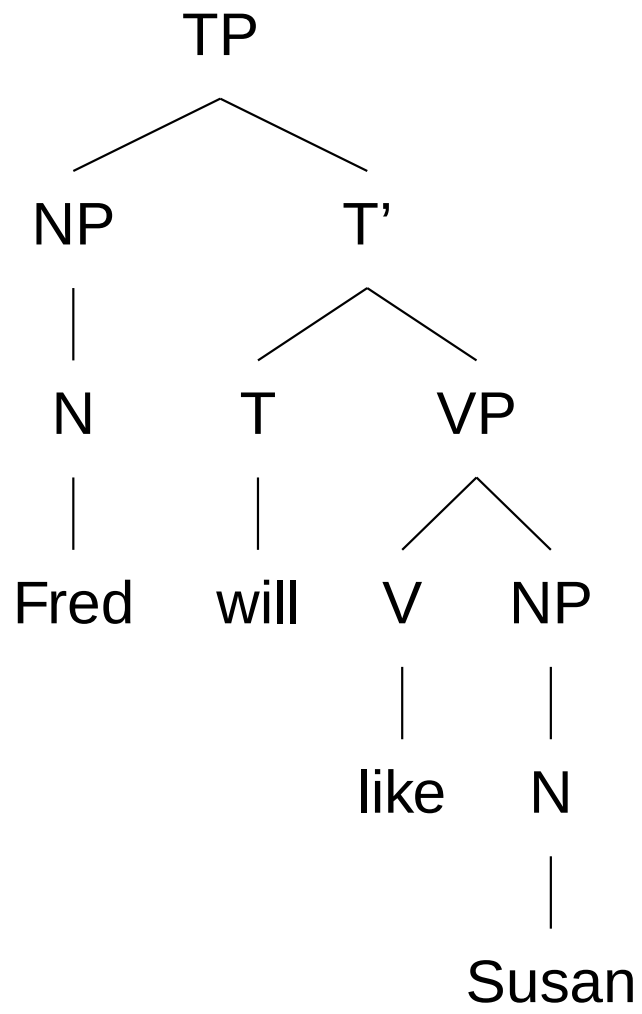
	Nominal	Verbal
Noun	+	–
Verb	–	+
Adjective	+	+
Preposition	–	–

A X-bar tree

1


N̄̄
Det
Specifier
N̄
Head
the
N
Head
P̄̄
Complement
picture
P̄
P
N̄̄
of
Harry

The Puzzle of Sentence Structure

1. S=TP (or CP)
2. 

Small Clauses

1. a. What?? Me worry??
   b. Fred a CEO??!!
   c. John arrested for murder??!!
   d. Power, off
   e. Device disconnected
2. Chung & McCloskey (1987) on small clauses, Simpson (1991) on nonverbal clauses in Warlpiri
3. Bresnan et al. (2016) on ‘endocentric’ vs ‘exocentric’ clause structure

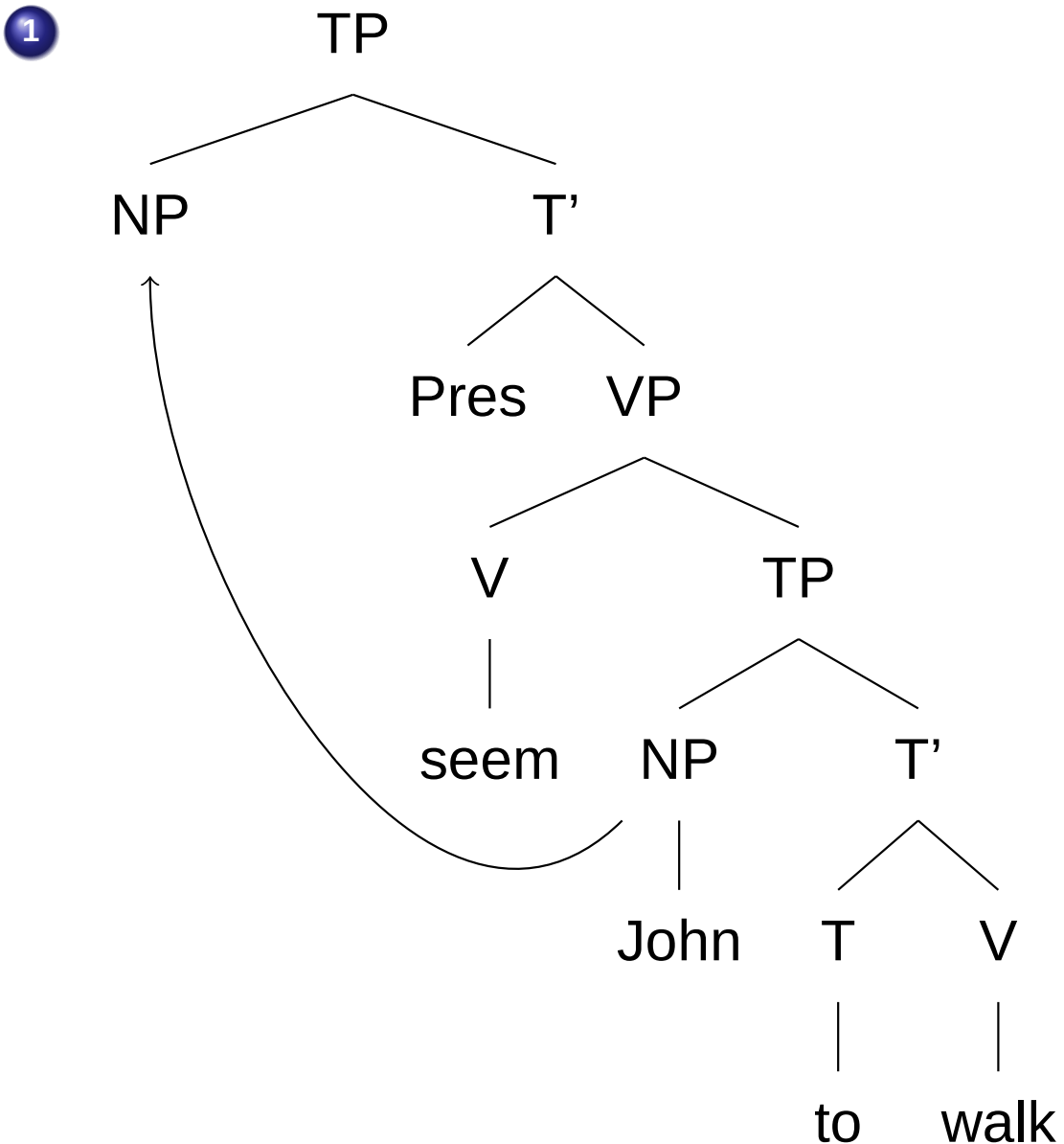
But . . .

1. All this was common to both papers, and Conditions actually backslid a bit, using a single oldschool passive rule for both Agent Postposing and Object Preposing.
2. So what were the objectors objecting to?
3. Two items for discussion were:
   a. C proposed to do away with the rule of 'Subject to Object' raising used to produce things like *Mary believed John to be crazy*, deriving *John was believed to be crazy* by regular passive, which cold apply across a putative clause boundary around [John to be crazy]. This depended a lot on transformations applying on the basis of linear order, ignoring aspects of constituent structure.
   b. He also proposed that in sentences such as *who does Mary think John likes?*, the interrogative pronoun moved in two stages, first to the front of the subordinate clause, then to the front of the second.

Aftermath

1. (a) is generally accepted to have been shown to have been false in the end (e.g. Chomsky, Gallego & Ott (2019: 248), but very interesting evidence turned up for something like (b), first found by McCloskey (1979) in Irish, more later in various other languages by Zaenen (1983).
2. I suspect that what was really going on was that although some of the late TG formulations were a lot better than the previous ones, they were still too complex, so that many people just gave up on making TG work, especially for the ones such as Passive that seemed to preserve most aspect of normal clause structure, but move things around. c.f. Bresnan's paper in Culicover, Wasow & Akmajian (1977).
3. The people who did not give up on some kind of transformational operations followed Chomksy into GB, and, later, Minimalism.

‘Analysability’



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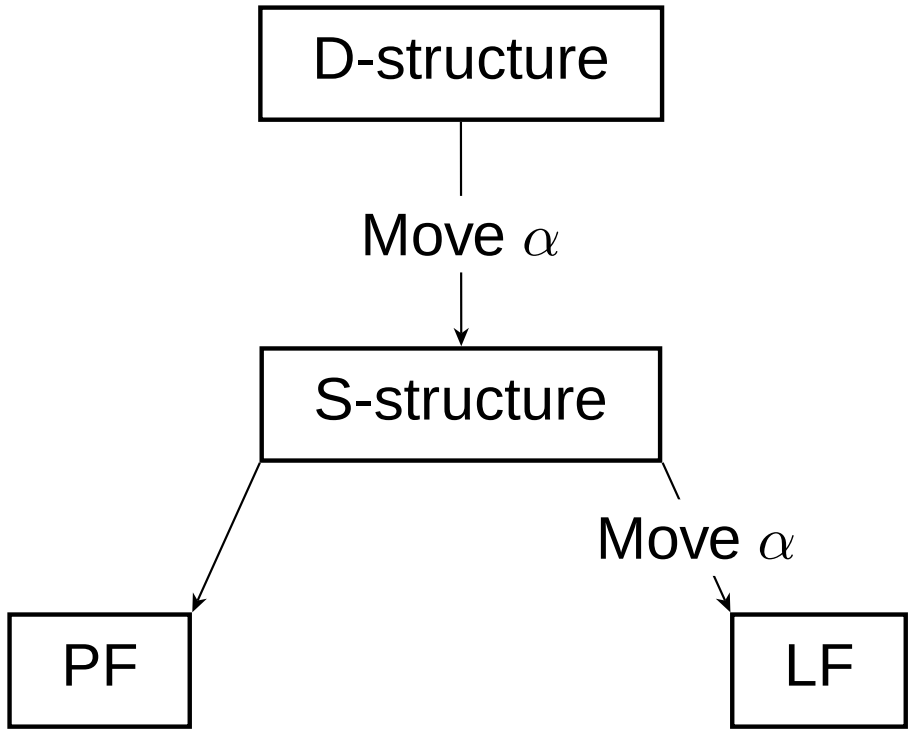
Government-Binding Theory (GB)

1. Founding document: Chomsky 1981. Textbook: Haegeman 1991
2. The PS rules and X-bar theory were retained.
3. But the goal of reducing all transformations to one, ‘Move (α)’ was explicitly formulated and pursued, ‘Agent Postposing’ abandoned.
4. Idea of ‘core’ vs. ‘periphery’ also included (not sure when these terms arose, but the idea was distasteful to the AGT-ers (all of them, I think)).
5. A ‘rich UG’ was proposed to address ‘Plato’s Problem’: how do we know so much, on the basis of so little experience (Chomsky (1986)). The problem of how this could have evolved, apparently rather quickly, had not yet been considered.

The T-model

1. 

2. ‘D-structure’ because there was too much misinterpretation of ‘Deep’ as meaning ‘profound’, or similar.
3. “From Deep Structure to Semantic Representation, pausing along the way to speak” – Mark Liberman, somewhere, sometime.

Some Characteristics of the GB Era

1. A considerable broadening of the linguistic range of TG
2. Much study of European varieties (e.g. Rizzi sending his grad students into the mountains to study their grandparents' dialects). Also other families.
3. 'Principles and Parameters' (P&P) was a general term associated with the approach, whereby most of the specification of a generative grammar was to be universal principles, thereby avoiding Plato's Problem, leaving a limited number of Parameters to be learned. Term still used, though the concrete proposals are very different.
4. Huge numbers of concrete analyses of different things
5. Many not entirely consistent theoretical proposals
6. By contrast with the AGTs, not much in the way of computational implementation.

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Bare Phrase Structure

1. The first Chomsky paper to name the Minimalist Program was Chomsky (1993a), but that seems to me to be essentially fairly technical garage cleaning; the striking proposal that leads to the present appears in Chomsky (1993b), text available at `https://biolinguistica.files.wordpress.com/2010/`
2. The most important concrete proposal was the abolition of PS rules, in favor of a general convention of Merge, whereby two items, either chosen from the lexicon or previously built, combined into one, unordered, structure, modelled mathematically as a set.
3. E.g. $X, Y \longrightarrow \{X, Y\}$. Except that, it was thought that one of the combined terms needed to be chosen as the 'label', so if X was chosen, it was really: $X, Y \longrightarrow \{X, \{X, Y\}\}$
4. 'Set' in the above implies, among other things, that the components aren't ordered.

Some Further Properties of the Approach

1. 'Move α' was retained (along with much else from late GB), although it was just called Move
2. And intended to apply only for some kind of reason ('Economy' would inhibit it, need to satisfy a morphological restriction would cause it to apply anyway, as little as possible).
3. There were concepts of 'interpreted' and 'uninterpreted' features, with the latter subject to 'checking' to get rid of them, often motivation movement.
4. The derivation was now conceptualized as providing input to two interfaces, 'Conceptual-Intentional' (CI) and Sensory-Motor (SM). A derivation would 'converge' if it satisified internal conditions and those at the interfaces, 'crash' otherwise.

Further Developments

1. A bit later, these were taken not to apply to the entire derivation at the end, but step by step, upward, in units called ‘phases’, with a phase ‘freezing’ an inner part of the structure while leaving an outer part (a specifier) as an ‘escape hatch’, from which things could be pulled higher.
2. This seems like a good idea; for example, if a clause is a phase, and you’ve heard *Who does John think that . . .* you know that the only parts of what you have heard that can be structurally part of what’s next is anything that can have gotten out the a phase ‘escape hatch’, and the initial *who* is the only possibility (given various further principles).
3. Result: the bottom up conceptualization does not exclude partly top down processing, as required by the word order of Englsh and many other languages. But, no discussion of phases in MCB, yet.

The Quest for Simplicity

1. This was also the beginning of a more determined quest for simplicity, referred to as the ‘strong minimalist thesis’ (SMT)
2. The idea is that human language is ‘an optimal solution’ to connecting the SM and CI interfaces, and therefore very simple.
3. An an important sub-idea is that there are three factors behind language design
   a. Genetics (that is, UG)
   b. Experience (what any given language is learned from)
   c. Laws of Nature (‘Third Factor(s)’), such as Least Effort.
4. This feeds into ‘Darwin’s Problem’: how did language evolve so quickly? Putatively, within the last 300k years or so, insufficient time for a complex UG to emerge.
5. Conviction that it is ‘only us’, not Neanderthals/Denisovians/Heidelbergensians, certainly not erectus.

But What About

1. Something that I think the SMT may be neglecting is the biological environment that the ‘faculty of language’ got dropped into.
2. Very likely a complex environment for the CI interface to hook into (great apes seem to be pretty smart, and Homo erectus was clearly a lot more capable and like us than they are); ‘conceptual structure’ might be very old). Parts of it back to the dawn of the animals 100s of my’s ago.
3. Phonetic realization is also very complex, and not much like anything elsewhere in the animal kingdon, afaik. So where did that come from?
4. Perhaps, given syntax, an arms race.

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Further Simplifications

1. Further simplifications (progress towards the SMT) seem to have started up around 2013, but here I mostly follow Chomsky, Gallego & Ott (2019) on what they were.
2. No more label construction. Merge$(X, Y) = \{X, Y\}$. Formerly a decision would be made as to which contribution to promote to label-hood; now, 'Minimal Search' finds the head properties. Looks like progress to me, since you would have had to use some kind of search to decide what the head was going to be, so why bother to 'project' it?
3. feature $<$ 'root'; lexical item (terminal) $<$ branching node.
4. Many further elaborations of Merge rejected. e.g. pair Merge creating ordered pairs. Only 'simplest Merge' left.
5. Also very important: Movement reconstrued as 'Internal Merge'.

Merge & Simplicity

1. ‘Syntactic Objects’ are built in a ‘workspace’. This definitely includes everything we have built so far, and may or may not include items drawn from the lexicon which we are going to use in our constructions (there seems to be vacillation about this; for MCB the workspace contains everything from the get-go.
2. Considerations of Least Effort are taken to imply that all you can do is take two objects already in the workspace (or maybe lexicon), and compose them together at the top level with no alternation (‘External Merge’/EM), *or*, take part of one object that is already in the Workspace, and reattach it to the top of whatever it is in. In either case a new node/set is created.
3. Therefore, all Syntactic Objects are either lexical items or binary tree-like-things.
4. ‘Tree-like’ because Chomsky talks about sets.

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Elements

1. MCB define the elements from which Syntactic Objects are constructed as being either ‘features’ or ‘lexical items’. There is a lot of variation in linguistics in what a ‘lexical item is’.
2. These terms are not explained in the text, but I think they can be taken to coincide at least roughly with the traditional distinction between major/open class items, and minor/closed class ones.
3. I will identify the ‘lexical items’ as the ‘roots’ of Harley (2014), to be discussed shortly below, and the ‘syntactic features’ as everything else.
4. New roots are easily learned (‘sploot’), and uses of old ones extended (‘action’ as a verb), whereas features are far more rigid, in both syntax and meaning.

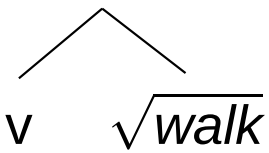
Roots

1. Following Borer (2009), Harley treats roots as essentially anonymous blobs in the 'pure syntax' (Merge).
2. But they have environmental restrictions and instructions for the interfaces: prononunciation and morphology for the SM interface, and semantic information for the CI interface. Plus contextual restrctions in the pure syntax. Possibly no connection to Information Structure.
3. Most if not all of the traditional content of 'syntax' can probably be located here.
4. She represents as numbers next to a square root sign, e.g. $\sqrt{42}$, but I will simply designate roots by putting their conventional citation forms under the square-root symbol, e.g. $\sqrt{walk}$ (roots would appear to be essentially the same things as LFG's PRED-features values as proposed by Andrews (2008; 2019)).

Words

1. To get actual words with a part of speech, we combine these with ‘categorizers’, such as ‘n’, ‘v’ and more.
2. Therefore, if we have a workspace containing ‘v’ and $\sqrt{walk}$, we can apply (External) Merge, producing (1) and a new workspace replacing (1) with the two items used to make it:

   (1)

3. This tree is binary and unordered (a fair amount of song and dance about this in MCB), whether or not it is just a convenient representation for a set, or a graph.
4. There are no labels on the mother; their role is taken over by (Minimal) Search for relevant properties.
5. Contextual restrictions say what roots require what categorizes and get what meanings.

Interface Instructions

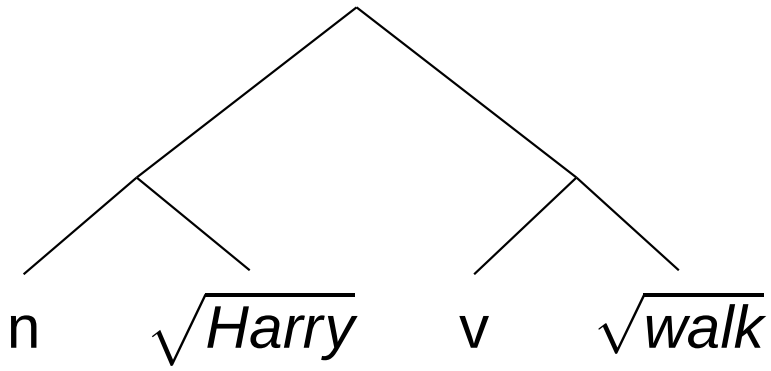
1. In Harley's paper, the basic syntactic objects in the lexicon are associated with two lists of instructions, one for each interface. List 1 is the list of roots (I don't see what it does).
2. List 2 specifies the SM interface for each item in list 1. Very simple for $\sqrt{walk}$, specifying only the pronunciation /walk/ (different details in different varieties of English).
3. List 3 specifies the CI interface for these items:

$$\begin{array}{lcll} \sqrt{walk} & \longleftrightarrow & \lambda x.Walk(x) & / \quad [\text{v} -] \\ & \longleftrightarrow & \text{“episode of walking”} & / \quad [\text{n} -] \\ & \longleftrightarrow & \ldots & \end{array}$$

4. 'Walk' is an 'unergative' intransitive verb taking an 'external argument', of which I am not giving the usual treatment, but just something like it that can be presented quickly.

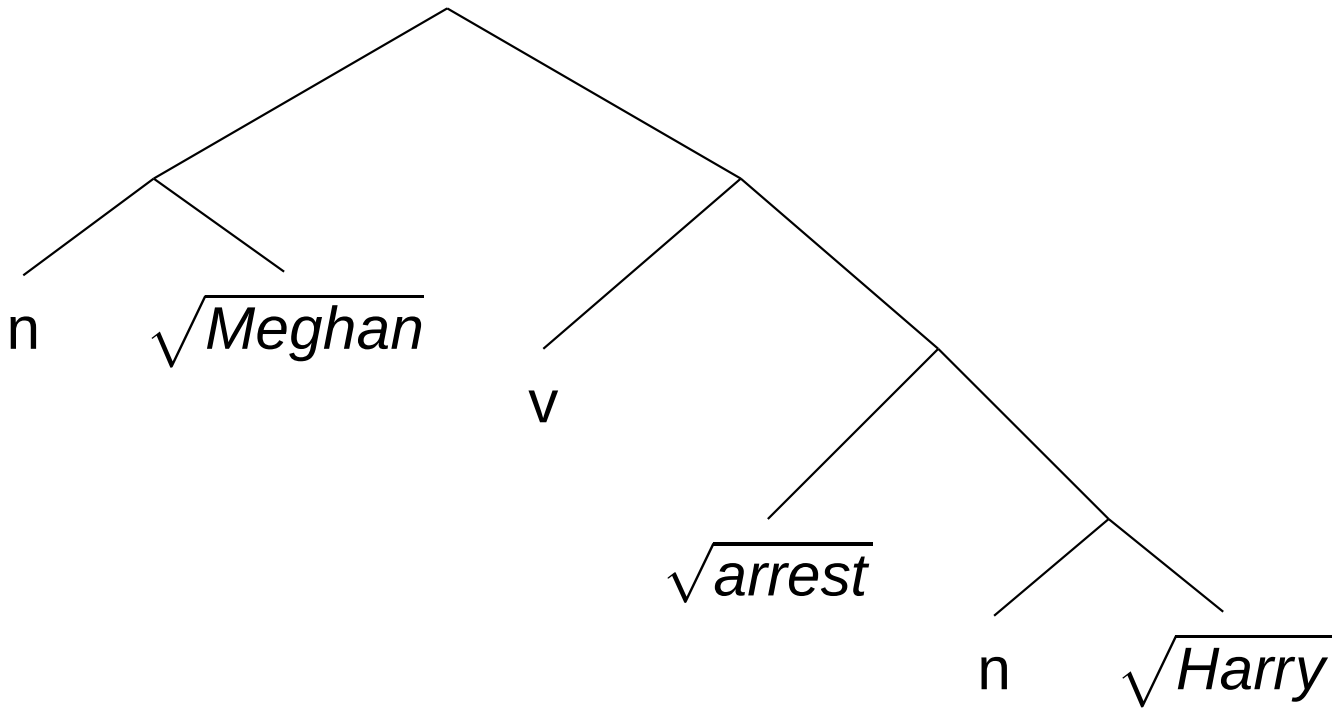
‘Unergative’ Intransitives

1. I will put ‘walk’ in the ‘Specifier’ position of the category V, producing this for *Harry walked* (no tense yet):



2. v will apply the external argument if it (optionally) has the following meaning-instruction, where ‘*S*’ means (the meaning of its) ‘Specifier’, and ‘*C*’ (the meaning of its) ‘Complement’: $C(S)$. We also want the result to be the meaning of the whole thing. ‘Glue semantics’ as used in LFG can do this kind of thing rigorously, but Minimalists would probably find it fussy and boring.

Transitive Verbs

1. For transitive verbs, we will put the subject in the ‘Spec of v’ position, but follow Harley in putting the object in Complement of the root position (this is controversial, it would be commoner to put it higher):
2. 

Semantics

1. This meaning-instruction for $\sqrt{arrest}$ will work, on the assumption that its result gets associdated with the mother of the root, just as was proposed for v:
2. $\sqrt{arrest} \quad \Leftrightarrow \quad \lambda x.Arrest(x, C) \quad / \quad$ [v –]
3. The meaning of (the structure of) *Harry* is sitting in the *C* position, it gets substituted into the semantic formula (plausibly, an abbreviation for something much more complex), and then the result is ready to be operated on by the v's meaning.

Passive

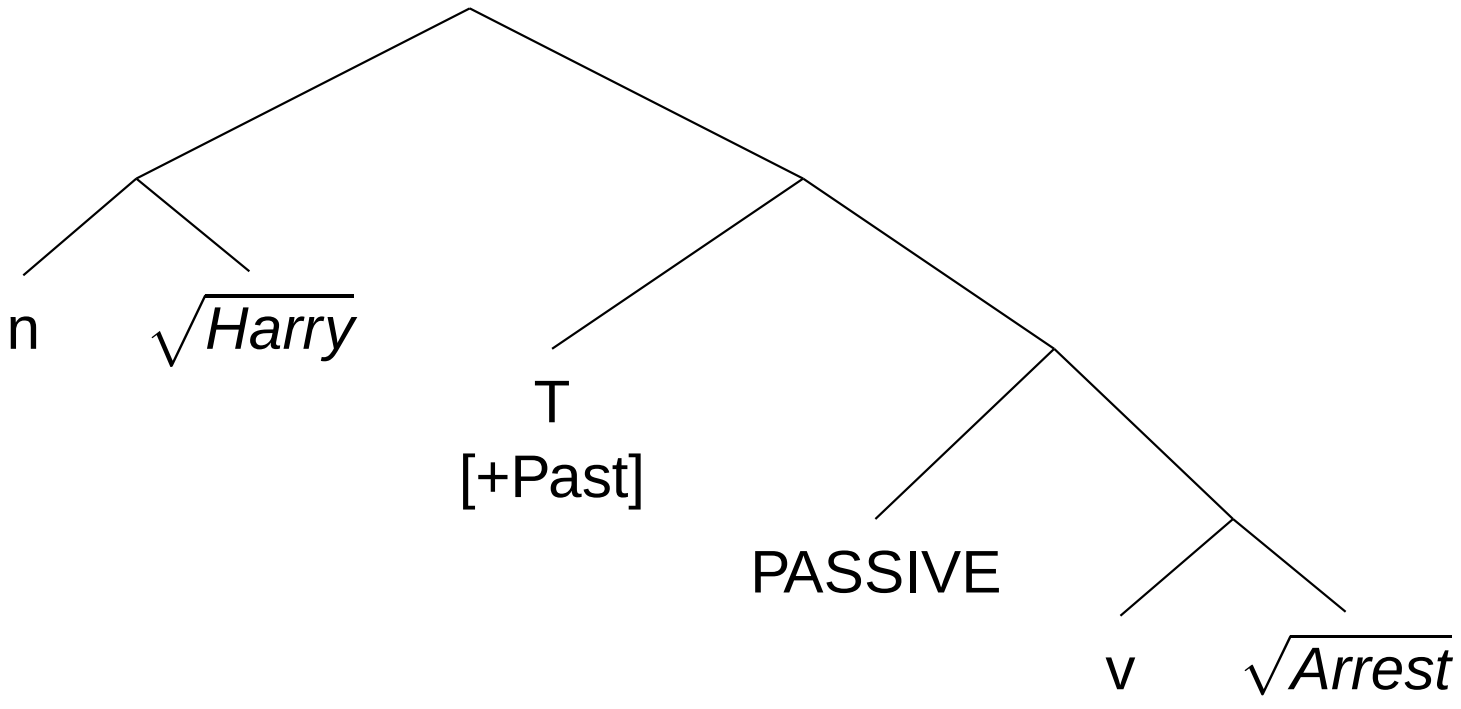
1. Passive-like constructions normally involve some kind of additional morphology, which can therefore be introduced as a feature.
2. We want it to apply to a v-headed phrase that does not have a specifier, requiring v to have an option to not do anything to the meaning (for reasons we won't look into, 'Unaccusatives', this is independently motivated. (Perlmutter 1983, Pullum 1988)
3. PASSIVE $\longleftrightarrow$ $\exists x(C(x))$ / [v –]
4. The recent sources I've looked at are pretty vague as to what to do about prepositions, so I'm only doing Agentless passives.
5. The semantics is also not so simple. Hot off the press from lingbuzz: `https://ling.auf.net/lingbuzz/007468`.

Tense

1. There is furthermore a requirement in English (and many other languages) for most finite clauses to carry a tense-marker.
2. My conjecture is that there is some kind of semantic operation, expressed syntactically by the T that we have seen before, that converts the ‘event type description’ provided by the verb and its arguments into a ‘statement about how things are’ (kind of speech act), which is sometimes spelled out in the morphology, sometimes not.
3. A further characteristic of English and many other languages that some NP needs to appear as Spec of T. This can be stated as an environmental restriction:
4. $\mathrm{T} \longleftrightarrow \mathit{Op}(\mathrm{C}) \quad / \quad [\mathrm{n}\ [-\ \mathrm{v}]]$
5. In English *OP* is supposed to be a past tense operator if the tense is past, present if it is present. I advance no proposal as to how this actually works.

Internal Merge

1. T does not assign any semantic (theta) role to the specifier it requires, so EM cannot be used to fill that position.
2. Therefore IM is used, grabbing the complement of the passive verb:



Word Order

1. We can now get the word order roughly right, by having the SM interface for English put ‘Specifiers’ in front of their (phrasal) heads, but ‘Complements’ after their (lexical) heads.
2. How do we know that T is the head in the above? This is not so clear. Perhaps T is a stronger attractor of head properties than the categorizer n.
3. There is also the problem of morphological realization, which is actually very tricky for English, due to the *do*-support phenomenon.
4. In many sentence types, there is a higher element above T, ‘C’ for ‘Complementizer’. Not discussed here.

Omitted Material

Two important things that are extensively discussed in the Minimalist literature but left out of MCB and MBC, and also herem are:

1. Anaphora and 'Form Copy' (ways of making pronouns, etc)
2. 'Agree': matching features across various distances, including longish ones, often triggering movement. (Verb Movement)
3. How will this work out (Andrews 1971; Quicoli 1982)

   Emmenomen hois homologe:samen
   will we abide by these things that(Dat.Pl) we have agreed
   dikaiois ousi e: ou?
   just(Dat.pl) being(Dat.Pl) or not

   Shall we abide by those things we have agreed are just, or not?

4. *toutois hois(D)* and *toutois ha(A)* 'these which' would also be OK, latter demanding *dikaia onta(A)*.

A Note about Sets

1. In the set-based version of Syntactic Objects, the simplest implementation of IM will result in the set having two positions in the structure, supporting a very natural interpretation of the example in (3) of the previous slide.
2. But Hopf Algebra math pretty clearly requires the target of IM to *disappear* from its original position. This makes sense if we think of SO's as graphs, because is natural for a node to care about its mother, and to want to have at most one mother.
3. No comparable esthetic applies to sets.

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