Why Move? Preliminary Thoughts and Overview:

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How 'Merge over Move' informs Early Child Syntax

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Abstract, Preliminary Thoughts and Overview
One of the leading questions burning in the minds of most developmental linguists is: To what extent do biological factors—such as a maturational brain—play a role in the early stages of syntactic development? This paper, pulled from chapter 2 of a monograph in preparation, summarizes the Chomskyan **Minimalist Program** framework regarding the theory of 'Merge over Move' and attempts to apply it to the earliest observable stages of English Child Syntax. In sum the conclusions reached in this paper suggest that early child syntax is structured in a flat (non-hierarchical manner) whereby (i) only sister-hood relations hold and (ii) that such a flat structure lexical projection would be what one would expect given the young child's limited capacity to project only simple bricolage merge operations. As a result of a delimited flat structure, all forms of inflection (which are known 'move' operations which require higher functional projections)) should be absent in early child speech. Such a Non-INFLectional stage-1 is exactly what we find in the data below. But such prosaic structures are not exclusive to early child syntax alone. They too show up in adult target syntax. As an opener to subsequent discussion, consider the semantic vs. syntactic distinction in the following examples (to be expanded upon later in the sections):

a. wine bottle > bottle of wine
b. coffee cup > cup of coffee
c. boat house & house bat

The data provided in this present paper provide one theoretical account for the failure of young children to apply local movement at the otherwise well-known stage-one of syntactic development. In examining token samples taken from data of a longitudinal case study, we determine that the lack of inversion and local movement can be theoretically modeled by addressing developmental issues which speak to the role that 'Move' plays in securing morpho-syntactic inflection. The paper attempts to address the question as to why children should fail to invert the compound coffee-cup (b) (the child produces cup-coffee) from the base structure cup of coffee? For example, Inflectional Phrase (IP) compound

structures which yield coffee-cup [[IP coffee$_i$ cup] ~~of~~ coffee$_i$] may require a higher clitic position as a result of a local movement operation from the base [PP Cup for coffee] (Roeper, 1999). A non-compliance of movement would then account for attested stage-1 child word-order deviance of the type cup-coffee found in our data. The earlier stages of syntactic development then might suggest that children first learn (formulaic) fixed word-order before they acquire any simple local movement (governing parameterized word order). Other more ubiquitous examples as our data will show come from IP-based movement analogies whereby nominal/verbal inflection is seen as a result of movement—e.g., *Tom's book* [IP Tom [I *'s*] book], drinks milk [IP drink] [I {s}] milk] (Kayne, 1994). Thus, a child goes from projecting flat merge operations of [-s [Tom book]], He [–s [drink]] (before movement) to *Tom's book*, He drink-s (after movement). Our data bear this progression out. The proposed theoretical model presented in this paper shows how the delay follows from a protracted development in which 'Merge' operations emerge in the child's grammar slightly ahead of 'Move'—a 'Merge-first' over 'Move-later' account of syntactic development. Furthermore, we examine recent evidence taken from ERP-related studies (Osterhout, 2007; Clahsen et al., 2007) which show (respectively) that earlier stages of L2 learning as well as L1 acquisition demonstrate an extended N400 signature to inflectional over-regularization; such over-regularizations are treated as lexical violations by these groups. Regarding L1 acquisition, the proposed model attempts to attribute a single mechanism Merge to the young child prior to the development of those brain processes which underpin the dual mechanism model Move. We can then attribute the extended N400 signature of over-regularization by these young children as a sign that they are incorporating the attested affix into the stem by a lexicalization process of (external) merge-first, i.e., a linear fixed word-order sequence. By incorporating both single and dual processing models in an ontogenetic manner, we can account for the gradual, protracted onsets of Move-related syntactic phenomena. Our current analysis calls for developmental discontinuity whereby a dual processing model is indeed justified on theoretical grounds—viz., a processing which seeks to distribute specific language tasks related to stem+affix separation to certain areas of the brain, inflection being just one such processing task—but that this dual processing must await maturational development of those regions of the brain which support 'trace-theory' indexing (Grodzinsky) involved with (internal) Move.

The nature of syntactic trees

One of the leading tenets that have come out of current linguistic theory is the notion that the formation of syntactic trees is based upon an architecture whose principles are ubiquitous throughout biology. A 'universal' architecture of the likes of the Fibonacci sequence, which seem to delimit prescribed binarity of branching to project syntactic structure to move in certain ways, surely captures our collective imagination, whether or not one ascribes to universalism. The very idea that the way we humans string words together may have ancestral links to spiral formations found in shell fish is nothing short of stunning. Yet, the 'golden

ratio' of Fibonacci holds. In this paper, we present what might look to be an example of the old adage—ontogeny recapitulates phylogeny, at least in terms of how we can connect the early building-blocks of the architecture to what we now know about the way binary branching might evolve in the scheme of child syntactic development. In making this connection, we examine the notion of early merge sequences as an early step formation of the binary architecture and then turn to the data to realize how the nature of the architecture impacts the emergence of the development of child syntax.

1. Movement in Language

Perhaps the most interesting and mysterious of all is the theoretical claim, a claim widely upheld by modern psycholinguistic experimentation[1], that human language is underwritten by a system that requires displacement—the notion being that an utterance might be heard in the phonology at an entirely different position from where it was originally parsed in the computation. This disjoint processing regarding what might occur on the surface phonology, as compared to what actual is the underlying syntactic computation, is ubiquitously referred to as movement in the theoretical linguistics literature. For example, in the (passive) utterance Mary was kissed by John, while the surface phonology first delivers Mary as the topic/subject of the sentence, the underlying semantic processing requires that it is John, not Mary, who is doing the kissing. This movement may require a hidden mapping to underlying semantics, at least to the degree in which the Agent (John)—now lower down in the syntactic tree—must perform the action of the verb (kiss), despite the verb being non-adjacent and potentially cut-off from the agent in the phonological string (e.g., Mary was kissed by John) [[agent-[John]] [action-[kissed]] Mary]. Certainly, a good syntactic notation must show how Mary has 'moved' across the verb and has situated above the agent. Movement in this way needn't be mapped exclusively to semantics but could also have a much more abstract syntactic mapping. Consider, for example, a phonological string which incorporates an existential expletive such as there in the example There were many students at the *professor's office.* Here, note that the verb were actually agrees in plural number with the true subject many students lower down in the syntactic tree, and not with what might otherwise appear to be the subject position occupied by the expletive there, which, in isolation, is non-specific with regards to its number feature. It rather seems that There is actually a recast of the subject many students with shared 'co-indexing' of features (such as person, number). The underlying syntactic structure thus looks something like Many students were there were many students at the *professor's office.* Again, we have what looks like some form of movement which has taken place in the derivation.

[1] Empty categories and fillers have been used in experiments to show that native speakers process and maintain in working memory items which have undergone movement. (E.g. see Felser and Roberts for one such study re. L1 vs. L2 empty category sensitively. From such studies, the term 'Shallow' processing (Clahsen ( )) has entered into the literature, 'shallow' in the sense that L2 processing may be more semantic rather than syntactic).

The fact that language makes use of such movement devices should not be entirely surprising given the fact that the human brain/mind was never evolutionary designed to be a mere serial-binary puncher of numbers and statistical averages of which outputs are mere generations of inputs—say, as would be the case if words, phrases and sentences were measured up against each other with the statistical winner being awarded victor and immediately handed-over to phonology. Language simply doesn't work this way. While there may be some notions of word selection (e.g., regular vs. irregular) or usage (new vs. old information) having numerical qualities which might prime production over lower statistical equivalents, etc., such binary weights & measures overall do not seem to creep into our larger scheme of speech processing (save for idiomatic expressions). If all of language were entirely collapsed onto some kind of race model of 'most-used-utterance-takes-all' consequence, most speakers would have to condense their rich linguistic tapestry of thought into a minimal amount of formulaic expressions, since race-models of this kind would always be searching and parceling out in sum only the greatest statistical averages of total utterances—something that just doesn't happen in language. The simple fact of the matter is that language carries emotions, not just words & usage, and that the total 'accumulative effect' must somehow be spread over different modes of thought, at different language mapping areas of the brain, perhaps with different stopping points and way-stations along the processing route. We now know to a large degree that different classes of words do in fact hold different emotions—e.g., the fact that lexical/substantive words generated in the temporal lobe of the brain holds the kinds of meaningful emotional values which can trigger an array of associations in a vast associative network. Other more abstract words such as functional words do not carry any such emotions, are generated in different areas of the brain and seem to escape networking effects based on priming and frequency. Linguistics don't tend to define the lexical/functional categorical distinction in such an 'emotional' way, but surely the way the brain partitions the two categories speaks to the underlying process of language in general, ant to the role of the dichotomy in specifics. Perhaps what makes language so rich in this extent—viz., what it is that is required of language in order for human discourse to be achieve—is the fact that in order to map onto several modes all at once, spread across different language-mapping sites, some form of movement along with a memory trace of the moved constituent must be incorporated in the actual processor. Such spreading of tasks certainly would require some amount of displacement.

One of the leading tenets driving research in theoretical syntax (Minimalist Program (MP)) has been to find ways to ease complexity and to lessen the burden of computation the syntactic processor faces. The unique nature of the human Language Faculty (narrow) (LFn)—which holds the syntactic processor as special amongst the array of modular language components—cannot be entirely autonomous since it must also work alongside and satisfy other broad and external sensorimotor & conceptual-intention (SM/C-I) constraints, otherwise known as LF (broad) (LFb). These external factors condition the internal interface to be as optimally designed as possible, to the point where LFn seeks as much elegance of economical as feasibly possible while still maintaining such external conditions. (Telepathy, if it were ever

to evolve in our species, would be free to break with such external conditions whereby an even more elegant system might emerge). It has been viewed within MP that the ways in which LFn indeed meets and thus satisfies such LFb constraints suggest language is a 'perfect system'. (We crucially note that putative claims of a perfect system can only hold-up when language is properly defined and understood as a formal internal computation—viz., a mentalese of thought (= LFn)—and not when defined via functionalism as a sole communicative platform per se, (= LFb). Along this line of reasoning that language is a perfect system, the MP seeks to establish a deeper appreciation for what LFn (= syntax) actually involves before any working theory of its internal processor can be sketched-out. The most crucial language aspect to appreciate here is the fact that syntax involves displacement—viz., the simple fact that a mentalese conception (which may or may not lead to an actual utterance) could come to occupy a different point in space/time other than that whence it was first triggered by a stimulus. Learning how LFn comes to handle such displacement is a major concern for those working within the MP.

Among the SM/C-I constraints, Working Memory (WM) has for a long time been considered a crucial factor in determining speed, accuracy and basic viability of syntactic parsing. The notion that the brain (cognitive/working memory) would have to somehow hold long constituent strings-of-words (derivations) while, at the same time, performing some computation on that string (movement) suggests that the burden placed on working memory, coupled with the load of the syntactic parser itself, would too heavily tax that which any normal human cognitive capacity could handle. In this sense, (pace functionalist claims) the abstract mentalese of language is actually 'poorly designed' for here-and-now style communication—where language's use of recursive embedding with nested structures along with co-indexing of traces due to displacement operations, etc., all lead to a kind of exponential memory growth which would heavily over-load any prerequisite stipulated by mere here-and-now associative communication. (One evolutionary side-note: Where did the biological pressure for such displacement come from in the face that it seems to work counter to communicative requisites?). The level of complexity that language bears on this problem approaches what might be at work regarding how DNA/genetic material is read. Certainly, as with typogenetics, with such highly complex levels, any processing/processor either becomes singularly reduced to automata, or becomes imbedded in the very part of the system itself upon which the work is being performed. MP has recently come up with the notion that language proceeds to be processed/read in larger incremental chunks call phases (which amount to genes in typogenetic terms—a degree removed from, say, smaller amino acids (words), and DNA (letters). Language therefore is not necessarily read piece-meal, bottom-up, in traditional notions of parts-of-speech words which form phrases, but rather by larger strings called phases, although there is some overlap between what constituents a phrase and a phase. Thinking about phases likes genes is not too far off the mark here, with chromosomes being analogous to complete stories (a collection of genes) within the human genome library of human story-telling.

In this paper, we follow in the wake of recent theoretical research undertaken in child syntax—e.g., Tom Roeper, among others working within the MP framework of Merge over Move (MOM)—and assume Roeper's notion of Phase to be redefined as any constituency which can be affected by MOVE (or the lack thereof)—where MOVE is understood as delaying the derivation from transfer (for interpretation) in order to secure additional '2nd order' syntactic/semantic/discourse interpretive readings: it is commonly accepted that such 2nd order structure projects from higher 'functional categorical' levels of the syntactic tree. Hence, we will view MOVE as the leading motivation not only for higher 2nd order syntactic structure (the emergent tree template), but also, as a consequence of higher order projections, as an exaptive processes whereby syntactic-discourse interpretations can be read. But in order to advance any MOM account which delays transfer at spell-out, we must first define what exactly constitutes MOVE. In so doing, there is an attempt to connect notions of semantics to syntax via a +/-Agreement parameter. For instance, a synchronic continuum of affix agreement is proposed to help with the defining of +/- MOVE—e.g., derivational affixes are defined as [-Agr/-Move] and Inflectional affixes are defined as [+Agr/+Move]. Such redefining characterizes the spectrum of affix morphology as a 'bundle of co-indexing/binding features' which hold perhaps over long structural distances. The [AGR/Move] parameter will also overlap with what we shall call productivity.

We'll argue here that very young children's structures (ages 18-36 months, give or take 20%) get sent to transfer as early as possible due to the fact that MOVE has yet to emerge as a parameter within their syntactic processor. In this sense, –Agr/-Move is seen as a setting which delays transfer of lexical items to higher functional heads up the syntactic tree. A maturational-based syntactic structure-building hypothesis is advanced in that young English speaking children are forced into projecting and interpreting syntactically impoverished utterances prior to the formation of MOVE, and in conjunction with the absence of functional categories.

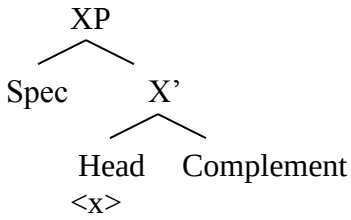
By analyzing each affix element and how it falls along the cline of affix continuum, we have a better chance at determining how that affix might be handled by a traditional syntactic tree. The overriding criterion determining where the affix falls in the tree will be (i) whether or not the affix abides by true co-indexing and binding (perhaps over a distance), and (ii) the level at which the affix remains productive.

1.1 Brain Processing

The main argument advanced herein is that very young children, just emerging from the out of the two/three-word stage (approx. 24-30 months of age) are unable to utilize movement operations of the type which result in higher Spec positions which can then host subsequent moved constituents. This inability has been represented in the child language acquisition literature (Ullman, Grodzinsky, Roeper, Galasso among others) as prima facie evidence that the Dual Mechanism Modal (See Pinker 1999, Clahsen 1999, for review) is (1) a viable theory which correctly addressed how the brain partitions

ambient speech input into two fundamentally different systems, and (2) the that DMM is not fully operational at the very earliest stages of child language acquisition. The conclusion stated in (2) gets redefined in such as way as to assert that within the progression of childhood inflectional morphology, a stage appears during which there is no evidence of movement. Hence, an early non-inflectional stage precedes the inflectional stage not due to there being a grammar deficit (i.e., not because young children can' t perceive possessiveness, etc) but because the relevant feature(s)—which can only be located on a head that has been raised from out of a lower position—can't be reached via recursive/movement. Conversely, children may at times even treat newly acquired affixes onto stems in ways which suggest they are not treated in a compositional manner—e.g., where past tense {ed} may attach onto a stem but where there is little evidence of the child realizing a past tense reference, etc.

1.2 Spec Positions



What will be shown is that Spec positions are the result of a latter projection labeled as 'merge-2', which drives functional projections. Multi-spec positions come about, as a last resort, only as a result of internal merge. There are no spec positions within base lexical structures since these prosaic structures only can combine flat lexical items in a non-hierarchical sisterhood relation. Hence, while there can be external merge within lexical categories (merge-1), that level of merge doesn't satisfy the criterion of 'move' since no higher hierarchical spec-position can surface within basic lexical projections. This allows us to posit the following criteria for merge vs. move:

Criterion of external 'merge-0': This basic level of merge takes place when two items of a sisterhood relation come together in forming a third item:

Criterion of internal 'merge-1' (merge/local-merge): This level creates a break in flat sister-hood relations whereby an XP can be generated with Head of phrase projection. Merge-1 captures a semangtic reading of move (otherwise known as 'local move').

Criterion of internal 'merge-2' (move/distant-merge): Only this formal move operation renders recursiveness, thus providing multi-spec positions along the way up the tree to host subsequent displaced items as a result of the rule-driven syntax. One possibility for tree expansion, for examples, is to suppose that case checking must be done in cyclic fashion, moving up the tree relevant to the phrase/phase where the checking off of case must take place.

External ‘merge-0’ comes free (out of design) and may not even be a result of a formal operation (viz., formulaic combining (breakfast), semi-formulaic combining (Howdoyou do?), as well as certain idiomatic utterances (*what’sup*?) may be the result of merge-0.) Such merge-0 structures may better be thought of as on a par with lexical items (and their mere combining).

Unlike merge-0 which is not a proper operation, ‘internal merge-1’ is the first possible operation to be considered, though it is restricted to operating within lexical categories. This prosaic combining operation is of a first recourse nature—creating lexical phrasal head/complement relations, derivational morphology as well as compound constructs.

It is only at our defined internal merge-2 operation that we can speak of true movement taking place across two or more nodes. It is at this level of operation that we can achieve move (movement-based) operations creating inflectional morphology.

Attempts have been made, as discussed in Minimalists literature, to reshape and redefine traditional notions behind lexical and functional categories. One recent attempt has been to redefine categories as nodes which can host a specific selection of ‘bundles-of-features’. In this paper, we depart from the traditional notion of categories and, while maintaining a ‘feature-driven’ theory of phrase structure, rather suggest that current understanding of ‘merge versus move’ (or ‘merge over move’) analogies can equally capture lexical vs. functional distinction, and do so in ways which capture what we do know about the development of those categories. In essence then, there are no lexical vs. functional categories of which to speak, there are only nodes which house specific bundles of features which project from out of either a Merge or a Move operation. The classic distinction between lexical and functional then can now be reduced to distinctions placed between merge vs. move operation. In addition, the well-known distinction between Derivational vs. Inflectional morphology could equally be captured by the merge vs. move principle.

1.3 Preliminary Data & Analyses

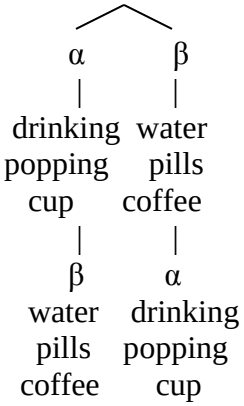
(1) a) drinking + water, water + drink (merge-0: base structure)
a’) → water-drinking (= merge-1: derivational/adjectival/compound)
a”) → drinking of water (= merge-2 (move)): inflectional)

(2) a) popping + pills, pills + popping (merge-0: base structure)
a’) pill-popper (merge-1: derivational/adjectival/compound)
a”) popper of pills (merge-2 (move)): inflectional)

(3) a) cup + coffee , coffee + cup (merge-0: base structure)
a’) → coffee-cup (= merge-1: derivational/adjectival/compound)
a”) → cup of coffee (= merge-2 (move)): inflectional)

Analysis

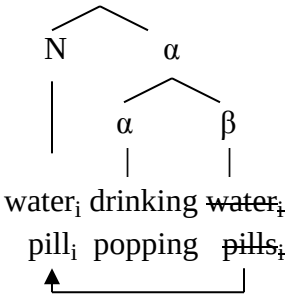
(4) (1) α



(1) Merge-0: [α+β] flat structure ('merge item')

Merge-0 involves external merge of two lexical items.
(showing varied word order)

(5) (2) NP

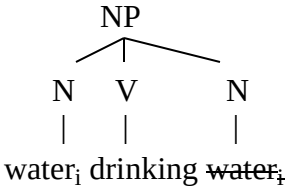


(2) Merge-1: [NP+VP] derivational ('merge numeration')

Merge-1 involves internal merge into a lexical category.
A phrase is created (Head/Comp)

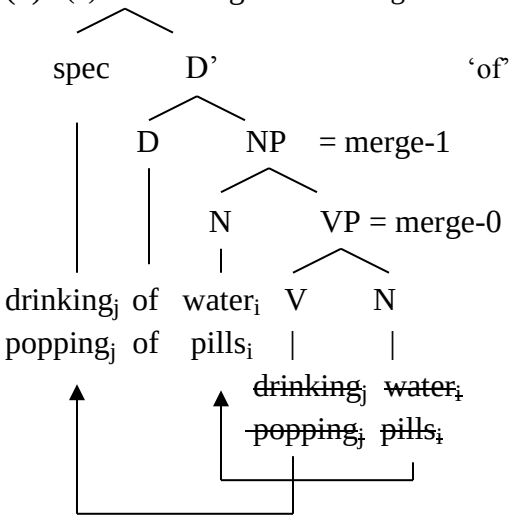
Merge-1 as shown above, establishes phrasal-compounds such as 'a water-drinking camel', 'a pill-popping insomniac', a rat-eating cat' etc. Also, it is at this level of merge where we find lexical compounds such as black-bird, top-hat, iron-fist, dry-clean, etc. Also, idioms such as 'How do you do?' (as one never says 'How does she do?') may be composites of merge-1. If so, all the above could be consider as formulaic lexical items with no other recourse to inflectional morphology. One alternative means of capturing the non-hierarchical lexical status of the sisterhood relation within merge-1 would be to say that they come out of a flat tertiary tree (showing no higher Spec position):

(6)



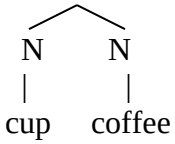
(Recall the classic experiment in which Peter Gordon showed 'rat-eater' to be a compound formation without inflection: Q: What do you call a person to eats rats? R: A rat-eater (not a *rats-eater). Note how the inflectional/plural {s} must delete as a result of internal merge—viz. merge-2 can't be applied within lexical categories. Only merge-1 can take place within lexical categories and, as a result, any residual D-feature which surfaces on a noun such as number gets deleted prior to movement).

(7) (3) DP = merge-2 Merge-2 involves internal merge into a functional category.

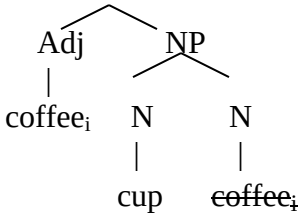


'of' (a functional item) merges with merge-1, creating a spec position of merge-2

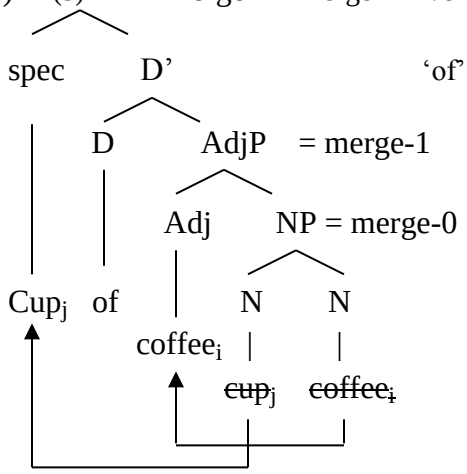
(8) (1) NP (1) Merge-0: [N+N] base structure ('merge item')



(9) (2) AdjP (2) Merge-1: [AdjP+NP] derivational ('merge numeration')



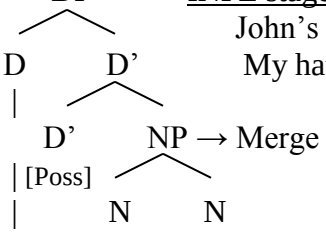
(10) (3) DP = merge-2 Merge-2 involves internal merge into a functional category.



'of' (a functional item) merges with merge-1, creating a spec position of merge-2

This same structure can be advanced with (i) possessive{ 's} structures as well as with Genitive case determiners (my, his, etc).

(11) Move → DP



	INFL stage-2 utterance	Non-INFL stage-1
	John's hat	John hat
	My hat	Me hat
(a)	John$_i$'s ~~John$_i$~~	hat
(b)	My$_i$ ~~Me$_i$~~	hat

1.4 Child Data and Expected Results

Given that the proposal here that very young children, (say between 18months and 40 months) can perform movement operations, the results of elicit experiments might reveal a bias towards simple merge-0 operations. For example, experiments could be designed to show young children's tendency toward merge-0 readings as opposed to merge-1 readings. Such experiments might look like the following:

Adult: picture 1: showing a (generic) picture of a horse.
Adult: picture 2: showing a picture of a (specific) horse drinking water from a bucket.
Adult: picture 3: showing a picture of the same horse standing next to a bucket.

Adult: instruction to child:
(a) Point to the water-drinking horse.

Allow then some time to past—then, instruct to child:

(b) Point to the horse drinking water

Result: Based on the proposal herein, one would expect the child's response for both questions (a) and (b) to be that of picture 2.

Other examples:
(a) Point to the high-flying kite

(b) kite flying high. Etc.

2. The Framework

We assume the **Minimalist Program** (MP) as our main point of departure (Chomsky 1995-current). The fact that Chomsky himself states Minimalist as a Program allows much room for runs on alternative perspectives and counter-theoretical claims. In an all-inclusive sense of the term 'Program', our focus here is to narrow our scope and assert an MP treatment on what has become considered as classic and uncontroversial data regarding stages of early child English syntax. Our essential claim herein will be that MP delivers us a strong internal/computational theory of language, with strong claims leading to the so-called 'three factors' of language growth and development: (i) the external data (the environmental input), (ii) the internal genetically endowed Language Faculty (otherwise known as Universal Grammar (UG) which 'catches' and 'processes' the input), and (iii) non-language specific demands which might arise from out of the architectural design of any organized and principled computational system. All three factors (the first two of which are exclusively language-based) squarely place language within the biological null hypothesis—viz., that language is both computational and maturational (both falling naturally from out of design and maturation of design). These two leading tenants lead to our findings on child language development. The third factor, an essentially 'non-language-specific' factor, might speak to cognitive/general problem-solving machinery which naturally falls out of the brain/mind architectural design. In any case, we must deal with this third factor too since it is an exclusive human brain/mind design which ultimately underwrites language. So, say, working memory, or the fact that phonology must be made linear to be legible—e.g., the stacking of phonemes /b/, /d/, /g/, yielding /bdg/ blur might not break a UG requirement, but rather just might be a non-UG stipulation based on human auditory constraints. Hence, some language essentials may come about due to demands on design alone, rather than, say, being stipulated as part-and-parcel of UG (meeting a language specific demand). A unifying approach will be to spell-out how all three factors converge within a morpho-syntactic template. A special eye will be

kept on linguistic theory particularly dealing with **Merge over Move (MOM)** and to see if a maturational hypothesis of MOM is warranted.

We take it for granted that child language morpho-syntactic development is determined by an emerging internal computational system (what is often called the 'Language Faculty' (LF)). Given this, then by definition, if stages are borne out during which child speech presents immature structures, it becomes incumbent upon the developmental linguist, somehow, to attribute such intermediate stages to a pegged immature computational system. Therefore, as I see it, the task of any sound child syntactic theory is to restrict the computational work-space available for the developing child, in any one stage of development, in ways which fit the child's speech production.

Specific to merge, we cite that it is not just one operation, but rather a family of operations—where the type of merge which gets employed is often dependent upon the nature and maturational complexity of the given operation. Merge therefore may follow a gradient typology in its own right, and when issues of maturation come up, an eye on the type of merge that gets employed (child language) becomes a central concern. We also argue that there is a more general developmental (maturational-based) sequence of **'Merge over Move'**. This broad sequence also seems to map onto a +/- gradient productivity cline whereby Derivational morphology sides with Merge and Inflectional morphology sides with Move. So, we have a two-prong hypothesis at work: (i) Merge in its narrow scope (developmental ontogeny—as determined by the type of merge employed given the nature and complexity) and (ii) Merge over Move in its broad scope (developmental phylogeny—as based on broad selective typologies/parameters of a given language).

2.1 Movement Applications

Movement has recently been defined within MP as a form of merge. But there is not just one type of merge. Rather, merge makes-up a family of distinct movement operations, with their defining aspects being delimited, for the most part, by two crucial factors: (i) Locality of movement (local intra-phrasal vs. distant inter-phrasal), and (ii) Nature of Scope (semantic vs. syntactic). When merge is said to employ the former kind (local/semantic scope), it is said to be **external merge**. When merge is said to employ the latter (distant/syntactic), it is said to be **internal merge (= move**). The following section sketches as an overview the two-prong distinction.

2.2 Merge (external merge).

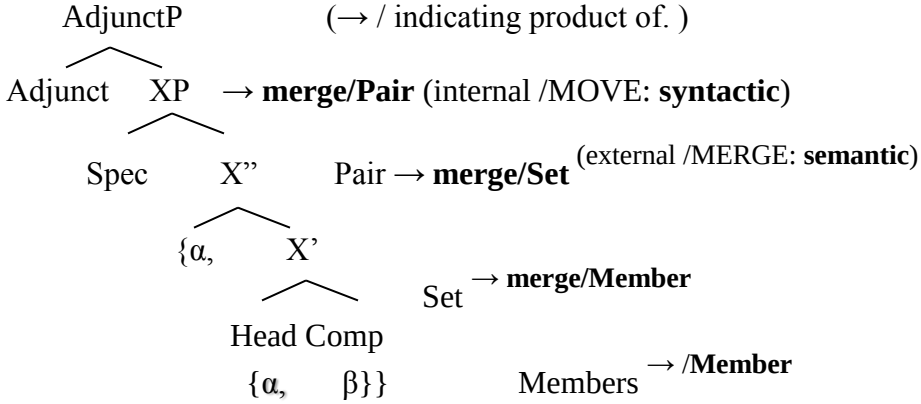
Merge is defined as 'BUILD' whereby a phrase is 'built-up' by a serious of step-wise and adjacent adjunct procedures. Phrase by MERGE is bricolage in nature. By building-up a phrase, by definition, new material is added on and created.

(12) Merge (merge/**Member**): merge of members yields Set: member +(α) combines with member +(β) (α+β, β+α) to form an adjunctive two-member **Set** {α, β} (with order not specified). This is the most basic of movement applications. Before any type of syntactic operation can take place, a derivation must be formulated by **Set.**

merge/**Member** is the most basic of adjunctive operations and involves only item-based flat and non-hierarchical sisterhood relations. merge/**Member** seeks to establish only a combined construct from the two items which provoke non-binding reference and thus may instantiate only local and disjoint referential readings to all NP arguments embedded in the Merge-phrase. Such adjacency factors regarding the two items—the simple pulling of two items from out of the lexicon and sitting them aside one another—might suggest that only low-level memorization is needed: viz., merge/**Member (α, β).** Such merge, by design, yields a **Set {α, β}:** (Lexical: Noun + Verb, Verb + Noun, Noun + Noun, etc.). **Set** is the simplest product of a merge/**Member** operation. Though, it is crucial to note here that no labels (such as Head-Complement) have been established to indicate phrase structure and heading other than the two lexical items themselves which make-up the set. Hence, word order is yet to be defined: S = {α, β}, {β, α}. The next step will be to perform a limited recursive operation (on a very local level) on the S(et). Call this limited recursion merge/**Set.** merge/**Set** would seem to require substantially higher-level memory than merge/Member, but is believed to be a device that too comes free from out of design (particularly if the design stipulates some principle of word order for language). Thus, merge/Set renders a prior single **Set {α, β}** as a symmetric copy of that Set. Let's call these twin sets a **Pair {α, β}, {α, β}**.

This copying mechanism could be seen as a kind of adjunction process whereby the second Set <S {α, β}^{2}> adjoins to the first Set <S {α, β}^{1}> . We'll come to label such merge/Set (adjunction) as an asymmetric {α, {α, β}} pair whereby the moved/copied item {α} remains as part of itself but positions at a higher plane. (Such merge/Set is said to break symmetry and thus serve as a potential template for hierarchical relation, whether it be thematic or syntactic, which will be later discussed). The phrase structure regarding merge/Set would look as follows:

(13)



After (step-one) the basic merge/Member has applied (bringing two syntactic objects together creating a set), the next step (step-two) is to see whether a subsequent movement operation is merely enhancing semantics, or is enhancing syntax. If movement is the former (semantic-based), than we have to define this sort of movement as 'first instance' external move (merge/Set)—with the latter (syntactic move) being labeled as 'second instance or internal move (move/Pair). So, if semantic, crucially, than what we have to indicate here is that merge/Set in the 'first instance' establishes a combining of items at an external-level to the extent that new semantic information is formed. (Such external movement is somewhat akin to what we would find with, say, lexical compounding where the combining of two items might create a third item—e.g., [[v $Break_1$] + [n $Fast_2$]] => [n $Breakfast_3$]). This 'new' information, on a semantic level, is typically defined by the fact that new thematic-grid information of the item changes as it moves up the tree. For instance, jumping ahead to the structure we find below, (previewed here in (14)) the verb 'roll' is said to move up the tree marking different thematic/argument information as it advances—e.g.,

(14) John rolled^2 the ball rolled^1 down the hill.

[rolled^2: They = AGENT causative argument structure—
e.g., 'They made the ball roll'

[rolled^1: The ball = THEME argument structure—
e.g., 'The ball rolled'

The same kind of semantic-level combining will later be presented in the way of compounding whereby, e.g., [Adj Black] + [N Bird] combines to yield [N Blackbird], with a very different semantic interpretation.

If and only if movement is enhancing syntax, then we have to define it as 'second instance' internal move (merge/Pair). Such internal merge equates to Move and serves to mark formal functional features attributed to syntactic scope and discourse—e.g., as seen with declarative subject raising out of vP into Tense Phrase (TP):

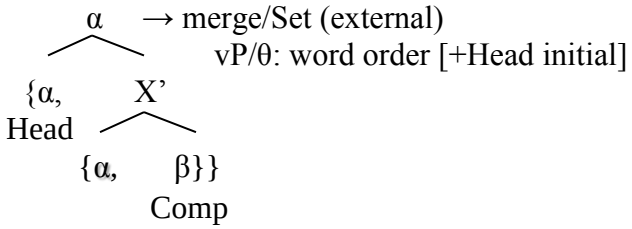
(15) [TP John likes [vP John to speak French]] (John likes to speak French)
[TP John likes [vP ____to speak French]]

*[TP __ likes [vP John to speak French]] *(Likes John to speak French)
*[TP __ likes [vP ____ to speak French *(Likes to speak French)

In (15), it is said that the subject 'John' must raise for reasons having to do with the Extended Projection Principle (EPP)—namely, in MP terms, the fact that a clause must have a subject. (See also (23) below regarding French style Head-to-Head movement along with subject raising).

In terms of labeling the phrase (e.g., DP, VP, PP, etc), it is the item that moves (in this case {α} of (16) below) which labels the phrase (Chomsky 1995: 397). The item which labels the phrase is referred to as the **Head** (with any element which comes after the Head termed as **Complement** (Comp)). So given the structure in (13), now provided with a labeling mechanism, X'' can now be relabeled as follows:

(16) '**First instance' merge/Set**

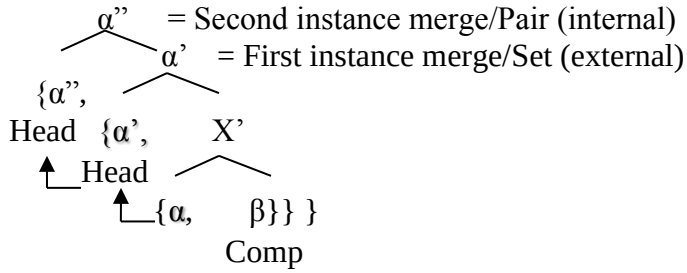


This yields the formation of 'first instance' merge. It is only at this point in the derivation that hierarchical argument structure can be formulated since prior to this juncture, at <merge/Member> {X' {α, β}}, only flat sisterhood relations held (with no potential for hierarchical schemes such as agent, theme, causative force application, etc. Indeed, we postulate here that thematic-relations can only be upheld via a first-order primitive hierarchy). We crucially note that formal **Word order**, from out of this 'first instance' merge thematic structure, is now possible if and only if a [+/- Head initial] parameter has been selected—e.g., English being a [+Head initial], [VP [V eat] [N ice-cream]] vs. Japonese [-Head initial] (a Head final language) [VP [N ice-cream] [V eat]]. In other words, merge/Set creates the structural space necessary for the [+/-Head initial] parameter to be potentially activated.

> (Note: this condition keeps open the theoretical possibility that a stage of derivation could exist during which young children—say, at a lexical/thematic stage of development—may adhere to (first instance) thematic-argument all the while entertaining mixed word orders, as attested in Single Argument Strings (SAS) stages of acquisition, see Galasso (1999)). In such a case the child would be at a stage of development during which merge/Set is active, though at a stage just prior to the setting of the word order parameter. Such a stage may witness children's ability to cope with thematic structure, though they lack the ability to fix word order).

Once we have word order fixed here as a result of a setting of the head directionality, coupled with argument structure, there still may be no available landing-site for higher functional/syntactic projections. So, starting bottom-up, once the structure in (16) is secured, we would still require one more additional step in the derivation to free-up available syntactic structure above argument structure and the fixing of word order. We'll term this second step of the derivation **'second instance'** merge (merge/Pair).

(17) **'Second instance' Merge**



The above verb movement in (17) is so called 'Head-to-Head' movement, as found in 'strong' languages such as French—

(18)[TP Jean$_i$ mange$_j$ [vP-θ/α __$_i$ {α, mange$_j$ }[X' {α, mange$_j$} { β, du glace}]]]]

('Jean eats ice-cream')

(While not shown in (18), recall that the subject 'Jean', here positioned in Spec-of-TP is base-generated lower down in the tree within Spec-of-vP, and raises to TP. This is referred to as 'Spec-Spec' movement').

Interestingly, such a multi-tier derivation of strong movement could be shown in so called 'complex constituent' clitic doubling (also seen in French) whereby a subject clitic elle starts out (19a) paired with the object clitic la, e.g, [la elle] (a double DP-complex structure), than (19b) has la-elle as a **Set** move as a constituent higher-up into a preverbal position, with (19c) final fronting of the member only: (19b) shows movement of **Set**, (19c) shows movement of **Member**. Consider the multi-tier movement analysis of the French utterance: cela la gêne elle? ('Does that bother her?'):

(19) (a) cela gêne [[DP [la]] [DP [elle]]]? ('that bother [[her/it] [she]]?')
(b) cela [la elle$_i$] gêne _____$_i$? ('that [[her/it] [she]] bother?')
(DP-complex move)
Move: Set <**S** {la, elle}>
(c) [elle$_j$] cela [[la] [__$_{i/j}$]] gêne _____$_i$? ('she that her/it bother?')

Move: Member <<**M** {elle}>, Set <**S** {la, elle}>>
(d) cela [[[la] [__$_{i/j}$]] gêne _____$_i$] elle?

We see the final derivation of movements in (19d) yielding the total sum of all movements:

cela la gêne elle? (‘Does that bother her?’) (Kayne, Pollock, 2010).

Kayne & Pollock extensively argue that such multi-tier movement is necessary in order to capture certain subtle facts about French clitic climbing of phi-features & Case licensing—namely, the fact that when the complex DP is split apart in the course of the derivation (as shown below), we are able to see just how the DP-internal gender/number agreement features link-up according to relevant constituency, and so noting the contrasts of acceptability between (ill-formed) right dislocated structures (which split the complex-DP) and base-generated ones (which keep the complex-DP intact). In this way, consider (20) below as parallel to (19), now with the added feature of dislocation:

(20) (a) Ce scandale la gênera-t-elle? (‘This scandale her/it will-bother she’).
Where la and elle are two different arguments: hence two different DPs.

Two Arguments: la (her/it$_i$), elle (she$_j$)
(i) cela la$_i$ gêne elle$_j$?
(ii) Ce scandale la gênera-t-elle

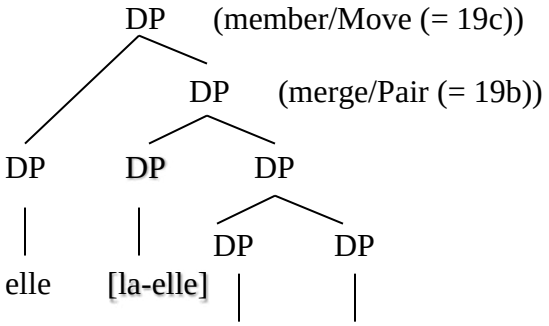
(b) *La gênera-t-elle, ce scandale?

*Where la and elle merge within one complex-DP (with agreement of phi-features), but, as a consequence, leaving out the required second argument (it/her). It’s the merging of the complex-DP in this way which voids out the second DP-argument reading:

*One Argument: la-elle
(i) *La gênera-t-elle, ce scandale?
(ii) *cela la$_i$ gene elle$_i$?

Returning to our structure in (17) above, we find that a potential complex DP-analysis of movement easily maps onto our template (reduced by stacking of DPs, not showing intervening verbal material):

(21)



Other considerations with regards to French clitic usage seem to suggest a distinction between:

(i) Free/strong subject pronouns (e.g., personal names or masculine pronouns Il) whenever the subject can be topicalized in initial position, and,

(ii) Bound/weak subject pronouns which cannot be topicalized or free-standing.

Free/strong subject forms (22a) are allowed to move (a term called 'clefting') whereby they can be topicalized in first (subject) position, or they can be clefted (d). Note the ungrammaticality of (g_{ii}), correct in (h): it seems 'and'-coordination in French requires the second subject to be strong (e_{ii}). The topicalized French pronoun Il is considered weak based on its phonological dependency as well as it syntactic distribution. Weak clitics below are to be analyzed in closed brackets—e.g., [Il-est] grand.

(22) **Some Data**

a). Paul est grand (Paul is big).
b). [Il-est] grand (He is big). (=> Clitic)
c). *[Lui-est] grand (He is big). (=> non clitic)
(note contrast between weak-Il and strong-Lui).
d). Paul est grand, C'est Paul qui est grand. (Paul is big, It is Paul who is big).
e). Paul est grand, C'est Lui qui est grand.
f). Paul est grand, *C'[est-Il] qui est grand
g). Elle est $petite_i$ et *[Il-est] $grand_{ii}$ (She is small and He is big) (contrast w/ (b)).
h). Elle est petite et Lui est grand (She is small and He is big).

Also consider French objects:
i). Le chien [le-mange] (The dog it eats (SOV order) (= The dog eats it)).
j). Le chien mange le biscuit (= The dog eats the cookie (SVO order)).

(Note how only weak pronoun/clitics can movement (a term called **clitic climbing**). Compare these example to Spanish, Italian, as discussed in class—e.g., Yo te-amo (SOV) vs. Yo amo a Maria (SVO), etc.)

It seems Clitic vs. Affixes: Clitic are free to move. Affixes are not.

k) The person [who you are talking about] **'s** walking over here. ({'s} = clitic)
(i) The person**'s** walking over here.
(ii) The person **is** walking over here.

l) The person like [who you are talking about] ***-s** Mary. ({-s} = affix)
(i) The person like**-s** Mary

There is sometime confusion over rather or not, for example, Case has any role in the distinction—viz., that Lui-est grand is ungrammatical due to a subject erroneously taking accusative case. This may be an over simplification. Case, in French, is not as transparent as it is in English. For instance, accusative case shows up in subject position with full subject verb agreement in coordinated structures e.g., moi et toi (nous) jouons. ('me and him play' = I and he play [+Finite]). Or note that subjects within embedded clauses take strong pronouns with {+nom} subject verb agreement—e.g., [Je pense qui [Lui est grand]] =>
[I think that [he is big]] (not him is big).

In sum, given the above inherent structure, the merge/Pair adjunction process would need to service two modes of movement-based operations:

(23) (i) **external merge (merge/Set (local))**—which drives **argument structure** (semantic in scope: thematic/lexical sub-categorization)), and

(ii) **internal merge (merge/Pair(distant))**—which drives **syntactic operations** (syntactic in scope: movement/trace-binding along with discourse-related properties (Chomsky 2001: 9-18).

The latter form of distant adjunction (internal merge (= MOVE)) is a narrow syntactic process given it renders redundancy of language in creating cycles of recursion. The former form of local adjunction (external merge (= merge)) could be considered robust in that it serves more of a communicative niche. Movement in language (i.e., 'narrow syntax') thus represents a form of an internal merge whereby an item first copies itself in one position, then displaces to another position at a higher plane. The Adjunct/Specifier positions above Head in (25) project from a higher plane of S and thus may pertain to a kind of optionality. For instance, the Adjunct/Spec positions may be adverbial in nature—e.g., (Today), I speak Spanish, (Hoy, yo) hablo espanol, where both Today, Hoy as well as Spanish pronoun Yo can all be optionally projected. The fact that the pronoun I in English can't be dropped (an example of the [-Pro-drop] parameter) suggests that there is a structural distinction to be made between an Adjunct and a Spec position: (with English pronouns projecting from Spec—since English subjects must remain 'local' (intra-phrasal, VP-internal) for semantic scope due to lack of inflectional co-indexing between subject-verb—and with Spanish pronouns projecting from Adjunct—may move at a 'distance' since subject-verb agreement is recoverable at a distance via

inflectional indexing (inter-phrasal). One could speculate here that the fact the English subjects must move into spec-TP has more to do with the EPP-feature than with anything else. The English subject is intra-phrasal. The Spanish subject therefore would be required to move for reasons other than EPP, thus rendering the subject inter-phrasal.

We call this type of distant adjunction **Move,** with no new material formed from the movement. This is opposed to local external move **(Merge)** where new material is in fact formed. This latter newly created pair via internal merge is crucial to language in that now the potential for recursion has been established via the very copying of the set of which selected items were already drawn from the numeration. It is our understanding within the MP framework—as it is believed to be something that comes par excellence out of design—that such a recursive operation must preexist prior to any formation of syntactic displacement. Only from out of such a copy-operation can a pair-of-the-set be formed: {α {α, β}}. merge/Pair creates the potential for a binding agreement relationship (similar to c-command). In sum, merge proceeds as follows (with the procession being maturational in development):

(24) Family of Merge:

a. merge/Member→ (forms a set)→ merge/Set (forms a pair) →merge/Pair

combine syntactic objects	θ-marking/semantic	syntax
flat-structure	sister-hood	displacement

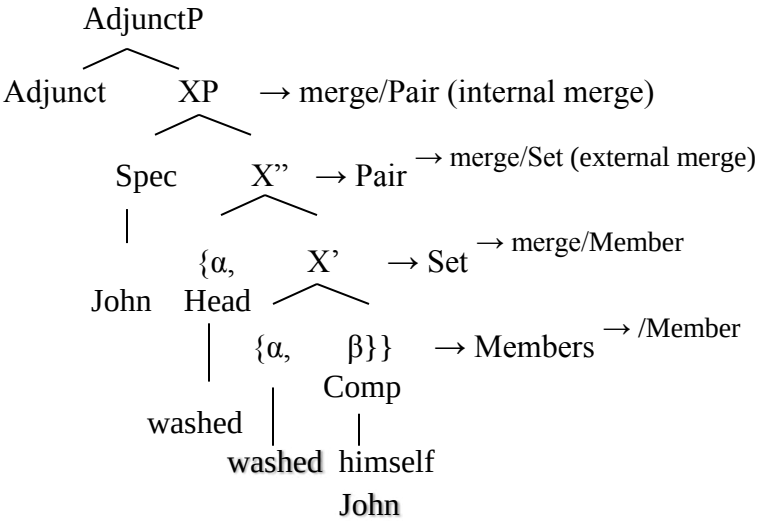
b. **Binding agreement relation.** Given (a), and our final note on a 'maturational procession' of merge just cited, for example, pronouns under (external) member-merge might be considered 'adjunct' in nature and could carry only inherent argument status (perhaps by default). This would carry a multitude of consequences. For example, because of a 'flat-sisterhood' status of the phrase under merge/Member, very early children's formation of pronoun structures might logically interpret the input utterance '*John washed him'* in two different ways—namely, at chance level readings between (i) disjoint referential (e.g., $John_i$ washed him_j) and (ii) co-referential (e.g., $John_i$ washed him_i) (= John washed himself).

c. Merge via merge/Member takes (i) syntactic objects (α, β) and concatenates them projecting a flat compound structure {α, β} or {β, α} (no ordering). We'll come to distinguish primitive merge/Member with 'first instance' merge/Set and 'second instance' merge/Pair. We'll define first instance merge/Set as having an inherent argument sister-hood status related to thematic-argument structure—though even at this phase, word order may not necessarily be fixed since thematic structures arise independent of word order. (True word order in this sense is thus a combination of merge/Set with [+/- head initial] parameter setting.

d. First instance merge/Set is necessarily 'non-recursive' in nature.
e. First instance merge/Set carries a feature specificity of [-Displacement].
f. First instance merge/Set doesn't necessarily fix word order, hence Single Argument Structures (SAS) based on merge could potentially show variable word orders.

merge/**Set** (external merge), unlike flat merge/Member, has the added feature of a copied structure (albeit semantic-based), allowing an item to move from out of an old derivation/argument position and be allowed to enter into a new derivation/argument position: $\{\{\alpha_i, \beta\}, \{\alpha_i, \beta\}\}$ with potential for a trace item $\{\alpha_i\}$ to enter into a 'c-command' probe-goal AGReement relation with subordinate pair. However, at this merge/Set derivation, it is crucial to note that the movements would only be semantically driven (as stipulated by the formation of a thematic grid). True syntactic movement, what we term MOVE, would still have to await subsequent formation of 'second instance' merge/Pair, a true internal move operation. merge/Set therefore does take-on some qualities of movement but with the crucial distinction that (i) **merge/Set 'probe-goal'** relations are deemed only **semantic** in nature (addressing thematic-argument relations), while (ii) true **merge/Pair—MOVE-based—'probe-goal'** relations are thus **syntactic**. It is due to the breaking of sisterhood relations that the primitive merge/Member (flat-sisterhood) status can expand into a merge/Set hierarchical status whereby, for example, children's production of the above cited pronouns would logically interpret now at higher-than-chance-level readings between (i) disjoint referential (e.g., $John_i$ $washed_i$ him_j) and (ii) coreferential (e.g., $John_i$ $washed_i$ him_i), since with merge/Set the latter sentences has the capacity of semantic co-indexing, delivering binding for a 'himself' interpretation (e.g. $John_i$ $washed_i$ him/$himself_i$). (We take it the it's the verb *'wash'* that actually co-indexes the reflexive binding feature, as indicated by $\{\alpha, \{\alpha, \beta\}\}$ where *'wash'* first positions within X' than moves into higher plane of X'' for scope/probe-goal relation). The subject John is seen as raising from out of VP (Comp: himself) and positioning within Spec of XP (=TP) as a product of cyclic merges. (Subject raises to spec of TP due to an EPP-feature):

(25)



[TP [EPP] John [Tense {ed}] [vP [+Nom] John/He [VP John/him wash himself]]]

(Nb. The shadowed mirrored 'John washed//washed John' might account for why young children provide two different readings to the utterance 'John washed him', as stated above. Namely, the flat mirrored X' structure (merge/Member→ Set) would not deliver the kind of semantic scope and hierarchy necessary for a thematic/reflexive probe-goal relation.)

This implies that Merge is implicated in the formation of a 'two-prong' probe-goal relation, whereby external merge/Set serves thematic material (and where perhaps 'local' adjacency conditions apply) and where internal merge/Pair (Move) serves syntax (at a 'distance'). Recall that reflexive co-indexing must be done locally as part of a semantic probe-goal realtion—e.g., [$John_j$/*$John_i$ wants [$Bill_i$ to wash $himself_i$]]

where 'himself' can only co-ordinate with 'Bill' within the local phrase (and not with non-local 'John').

Two types of probe-goal relations are defined as, using the structure in (25) above as a model:

(26) (i)'First instance' merge/Set (external) probe-goal = semantic/thematic
a. Possible stacking of merge/Set for thematic grid (as shown in (28) below).

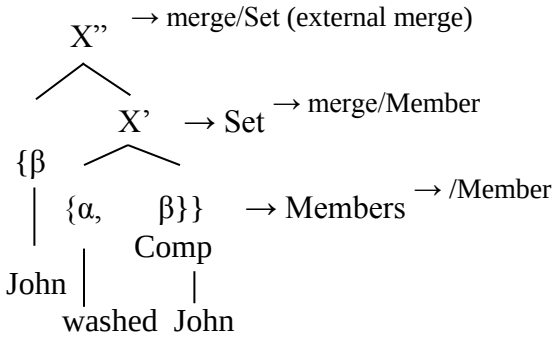
(ii) 'Second instance' merge/Pair (internal) probe-goal = syntactic.

Hence, there are two types of Probe-Goal relations:

External-merge (merge/Set)—Argument-structure (θ-role, semantics) which arises out of first instance external merge. Such external merge/Set operations could undergo stacking such that multiple thematic structures could be handled by merge. This mode of merge stacking may provide only **catographic** hierarchy (e.g., Cinque, 1999) which then feeds into semantic interpretation. (Adjacency is required: forming new structure).

Internal-move (merge/Pair)—Discourse-structure (recovery of old information, specificity and syntactic scope and EPP—all of which can only arise out of Movement. (Displacement is required: forming no new structure). In (25) above, the subject *'John'* is required to move from out of the lower VP due to the EPP. Such movement would constitute as syntactic internal MOVE (merge/Pair). Regarding the moved subject *'John'*, one could envision a flat structure whereby the subject would remain within merge/Set yielding a non-reflexive intransitive structure—e.g., washed John, John washed (with mixed word order):

(27)

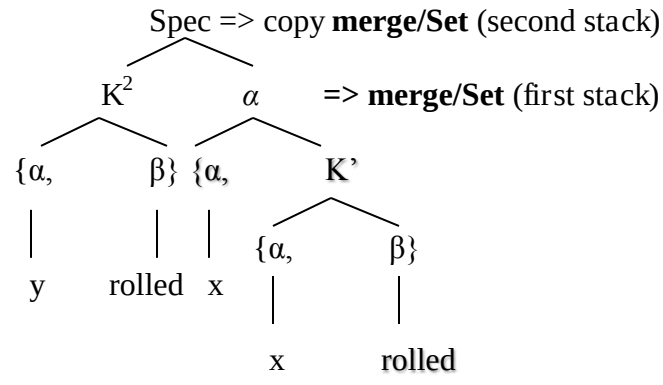


a. [washed John]
b. [John washed]

External-move is what is at work when the verb ‘roll’ moves up the tree to cover its theta-markings (ergative predicates):

e.g., [John rolled$_i$ [the ball rolled$_i$ down the hill]]

(28)



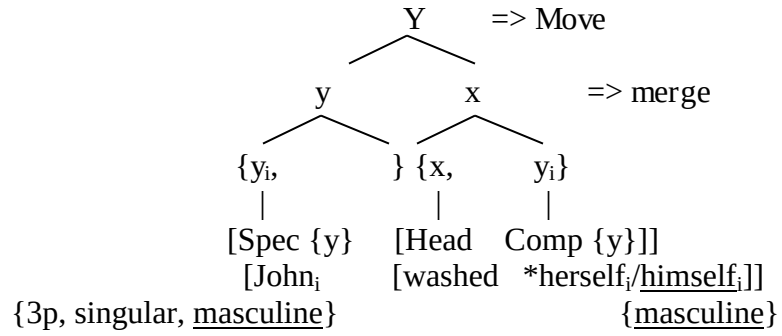
theta-roles: ‘made to roll’ ‘underwent action ‘roll’

(y = John, x = the ball)

(Also note that well cited Double Auxiliary Copy constructs typically attested in early child speech may similarly be accounted for by using an overlap copy set-merge/pair merge template—e.g., Can its wheels can spin?, Is the steam is hot? (Data cited in Radford 2004, 156). In such copy constructs, what seems to be at work is that the moved/copied set-merge Auxiliaries can/is simply fail to erase within in the lower pair-merge).

Internal move is at work whenever a Comp and Spec would have to **AGRee** (Agreement features). MOVE is generated in order to check features entering into an AGR-relation. In short, MOVE is AGR:

(29)

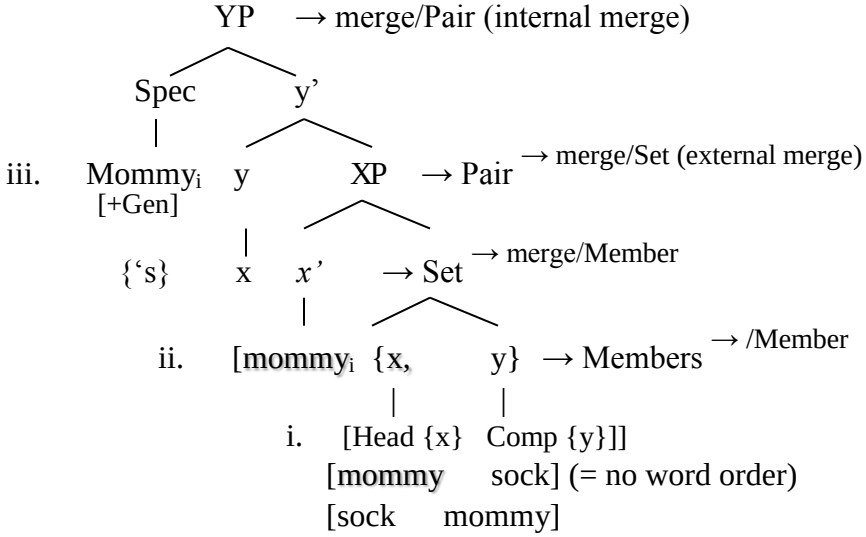


Or, when agreement via an inflection is generated—as with possessive [Genitive] constructs showing {'s} inflection:

> (Nb. Of interest here is the fact that it is NOT the reflexive feature itself which motivates internal move (recall that reflexives could be captured within external merge as shown in (27) above). Rather, it is the fact that an AGReement mechanism has now been introduced which forces internal move. In this sense, Reflexive co-indexing is deemed semantic/referential (entails local binding) whereas Agreement is syntactic/discourse (entails distant binding). This is a crucial distinction to be made here).

Note below how the AGR of Possessive/Genitive feature would force MOVE:

(30)



i. Shows members pulled from the lexicon (mommy, sock). These items then make-up a set <x'>, or <S {x mommy, y sock}>. There is yet no word order at this point nor is there any thematic hierarchical structure.

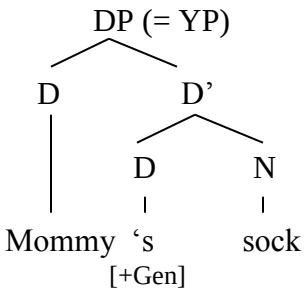
ii. Shows thematic hierarchical structure related to lexical/thematics. Hence,
there is word order. There is yet no inflectional morphology.

iii. Shows higher functional projection serving as a site for syntactic projections (such as inflectional morphology).

iv.

The structure in (30) above is reduced to the more commonly notated DP below:

(31)



In (29) above, it is commonly understood that the Comp(lementizer) himself is c-commanded via Agree and is bound by the Spec(ifier) John. The verb wash may in fact carry such AGR material and serve as the probe for the Comp goal. In (30), the genitive/possessive {'s} projects from out of a DP, which places within the tree above an NP. Both examples of movement are syntactic in nature and may not alter the semantics of a given counterpart utterance: though, later on we will address a semantic/syntactic distinction between, say—e.g…,

(32) 'Wine bottle' [NP [N wine] [N bottle]] (= merge/Set),
vs.
'Bottle of wine' [DP Bottle$_i$ of [NP wine bottle$_i$]] (= merge/Pair)…

…where apparently MOVE does alter the semantic interpretation.

Following the logic here, it would seem to be the case that very young child utterances consisting of exclusive Single Argument Structures (SAS) would provide no outlet for hierarchical structure, an only pair-merge would suffice.

On the other hand, Double Argument Structures (DAS), by definition of them coming out of a binary branching structure, would have to involve so sort of copy, thus yielding set-merge naturally from out of design. The fact that we find fixed word order only at the set-merge stage reflects this hierarchical advancement in structure. In sum: set-merge creates a position for a moved element to enter and potentially become a head. Once that takes place, the [+/-Head initial] parameter kicks in. Prior to this, there can be no head since there is no identification or labeling (all elements within pair-merge are equal sisters). Young English children at the pair-merge stage should be able to fluctuate between saying things like [wine bottle] and [bottle wine]. There is much child language data to this effect.

Questions here are not trivial. For instance, does external merge come for free, fall out of design? Well, pair-merge certainly does! However, there could be two views regarding set-merge: (i) set-merge may in fact be postulated (like the EPP property) in order to secure a break in sisterhood symmetry, (since language must be recursive and hierarchical), or (ii) set-merge, like gene-copy in our DNA metaphor, comes for free as part of a well designed computational system (a computational system that might not have evolved in an optimal way to serve communicative, but rather optimal in nature for reasons having to do with mental (internal) language (thinking, planning, consequence of actions, etc.). (It seems, following Chomsky in his recent work, that the latter is to be preferred. We will assume this here, although nothing hinges on it, and suggest that it is only 'set-merge' which yields notions such as term-of, dominates…establishing first only local/adjacent anti-sisterhood relations. These relations then become even more articulated and can cover a longer distance by c-command/Agree. In fact [+/-distance] of relation could be used as a measuring stick for defining Set-merge (semantics) over Move (syntax), where the former is more constrained by locality (intra-phrase) and where the latter is free to reign over a distance (inter-phrase).

There is now a 'two-prong' copy theory of movement:

(33) (i) Local, Set-merge $\{\alpha, \beta\}$, $\{\alpha, \beta\}$ with probe-goal/semantic (external merge),
(ii) Distant, Move $\{y_i, \{x, y_i\}\}$ with probe-goal/syntax (internal merge).

Hence, both forms of merge come for free and fall out of computational design. Set-merge creates local semantic hierarchy, whereas Move creates distant syntactic displacement. Both satisfy conditions imposed by the C-I interface (conceptual-intentional interface). This notion of 'local vs. distance' will overlap with the morphological cline given below showing [+/-productivity] having to do with Derivational vs. Inflectional morphology. What we'll suggest here is that derivational morphology is 'local' Set-merge related and semantically orientated (as is compounding), whereas inflectional morphology is 'distant' MOVE-related.

Move (internal merge).
Move is defined as 'EXPAND' whereby a syntactic tree expands ever further upward, as motivated by the need to check-off formal, non-interpretable features along the way (such as the {masculine, 3p, singular} bundle of features found with the Spec-Comp AGR relation., cf. John washed himself). By merely expanding a Phrase/Phases by MOVE, critically, no new material is created. (The co-indexing of John with himself creates no new material). Like Set-merge, Move involves hierarchical (non-sisterhood) relations which result out of some raising—e.g., Spec/Head$_i$ of XP^1 → Spec/Head$_i$ of [XP^2 [XP^1]]. The crucial distinction between Set-merge (external) vs. MOVE (internal) is that MOVE-based non-sisterhood

relations are purely syntactic in origin while Set-merge non-sisterhood relations are thematic.

(34) a. Move involves binding and coreference of potential moved item. Thus, pronouns may take on (better than chance) distant binding/coreferential readings (e.g., $John_i$ took the mirror and looked at $*him_i$ / him_j), where $himself_i$ becomes employed for binding and coreference.
b. Given (a), pronouns under Move carry structural argument status.
c. Move (i) takes a previously formed compound structure {α, β} from Merge, and (ii) forms an expanded version yielding {γ} where $\gamma = \{\alpha_i, \{\alpha_i, \beta\}\}$.
d. Move is necessarily 'recursive' in nature.
e. Move carries a feature specificity of [+Displacement].
d. Move fixes word order e.g., via [+/-Head initial] parameterization.

3. Move-α

More than any other syntactic operation, it seems that the operation 'Move-α'—an optional operation which basically allows for a syntactic item to be moved (from out of its base-generated position) anytime, anywhere—has become the singular phenomenon that separates and defines human language from that of all other modes of (animal) communication. Given this 'exceptional status' among the human computational system, it should be of no surprise to us that move-α comes with its own portmanteau of features, namely the fact that move-α is principle-based ('move' comes for free as part of the language design), is govern by UG parameters (in determining whether or not it manifests and to what extent across language structures), and perhaps the most intricate of features is that 'move' works in direct tandem with the brain-to-language corollary. If the brain shows a protracted maturational development with regards to language, then we should equally find that 'move' suffers similar delays. The burning question in the minds of most developmental linguists then is: What is the nature of movement delay in young children? What are the exact consequences to this lack of movement? And, with a touch of backwards engineering, can we get a rough peek at what the more primitive structures of early child language look like prior to movement? This latter point is of interest to evolutionary linguists (evo-linguistics) as well as to those of us who are curious about the biological basis of language—to the extent that movement may be a window into how humans have evolved and development abstract thinking coupled with the ability to utilize recursive and embedded structures uniquely found in language. On this point, if 'ontogeny really does recapitulate phylogeny' (Haeckel)—and this point may not be entirely infeasible as is so often popularly claimed, at least on the language front, namely, that the child's early stages of speech development might in fact mimic that of a human language trajectory along the evolutionary path—then we might expect any putative nature of a Proto-language and initial child grammar to be without movement (as is claimed of Proto-

language by Derek Bickerton's 1992 classic book 'Language and Species'). Regarding ontogeny (of the child), it is becoming exceedingly accepted by developmental linguists that early child language indeed starts-off predominately in the iconic 'here-and-now' world, with very little if any antecedents to movement operations as would be attested both by the child's cognitive behavior and/or by her linguistic capacity. We'll consider such a protracted, maturational scheme of movement onset to be the biological null hypothesis.

The sole objective of this book is to focus on the operation MOVE, tease apart any theory-internal distinctions between MOVE versus Merge (where the latter will come to be defined as the more robust operation by which essential aspects of language are underwritten by so called iconic 'here-and-now' associative mechanisms, underpinned by brute memory and frequency of the stimulus, and where the former MOVE serves as a counter-balance to meaning/associationism and deals much more exclusively in the abstract/computational realm. All the while, we shall keep a keen eye on maturational properties which might underwrite MOVE and the MOVE over Merge (MoM) distinction. In this sense, the brain-to-language corollary is advanced in MoM terms. The core of our discussion will be centered on Early Child English Language, and its protracted developmental stages specifically having to do with movement applications.

Preliminary Thoughts: A jumping off point—Assumptions based on Chapter 4[*]

3.1 Let's start from the beginning…before Move—'When the World was Flat'.

[Step 1]. All lexical items are/must be **legitimate object** as drawn from the **numeration** (lexicon)—what we shall term auto-semantics, viz. features intrinsic to the lexical item (encoded inside the lexical item). For instance, the fact that nominals (N) have the capacity to encode Number or Case follow from general principles of the lexical item N itself and not from any derivation of N, or how Verbal material (V) may take an array of argument structures, etc.). If, say, there are derivations specific to selected lexical items—for example Nouns regarding Case (inherent vs. structural vs. default)—than the derivation is said to lay outside of the scope of general principle and must be rather defined as an item-specific lexical operation known as sub-categorization, a subset of general principles. In this sense, while auto-semantic features are drawn from an invariant universal pool, they may however get variably expressed as language-specific. The important aspect here is that such intrinsic features needn't be expressed outside of the lexical item itself (no further application has to take hold outside of the specific lexical entry). Any other feature not made intrinsic by the item itself must somehow be added-on by an outside **scan-operation** (which Chomsky terms 'Array' (p. 236)). Possible outside formal features which might be added-on later after an 'object' has been pulled from the lexicon

[*] Noam Chomsky 'The Minimalist Program' (Chapter 4).

include Case, Tense and other phi-feature which include Person, Number. Such features can be viewed as either being intrinsic to the item itself (when such features are incorporated) or added-on by a secondary operation. The dual distinction may be what is behind, e.g., 'feature strength', say, found between English (weak) vs. French (strong), with the latter showing verb movement (or late lexical insertion) in order to acquire/check a formal strong feature such as T(ense). French verbs show movement raising to T and thus get pronounced within TP. On the other hand, English main verbs do not raise to Tense before spell-out of phonology, and thus English main verbs get pronounced within the base-generated VP. On the former point, 'late lexical insertion', another view might have it that French verbs get directly pulled from the lexicon already fully inflected (late/strong) while English verbs rather utilize secondary affix operations (early/weak) (e.g., Lasnik 1995). For example, the English/French Negation markers (not/pas) have often been a good measuring stick in the derivation in determining whether or not the main verb has crossed over into a Tense Phrase (TP), with the structural configuration universally placing Neg above VP and below TP: e.g.,

(35) (CP)>TP>NegP>vP>VP.

Using this universal template structure (made available via UG) we can see how French main verbs show movement into T similar to English auxiliary verbs (Do, Be, Have, could…) but unlike English main verbs which show no such movement:

(36) a).	[TP John [T [Aux] does]	[NegP [Neg] not]	[VP [V] speak well]]
b).	[TP John [T {-s}]		[VP [V] speak-s well]]
c).*	[TP John [NegP [Neg] not]	[TP [T] [Aux] does]	[VP [V] speak well]]
d).*	[TP John [T [v] speak-s]	[NegP [Neg] not]	[VP ___ very well]]
e).	[TP Jean [T [v] parl-es]	[NegP [Neg] pas]	[VP ___ tres bien]]
f).	*[TP Jean	[NegP [Neg] pas]	[TP [v] parl-es tres bien]]

Note above that English, unlike French, does not undergo main Verb Head movement—i.e., English main verbs are not pulled by syntactic move. When Tense and Agreement are (for whatever reason) blocked at LF, the Dummy 'Do' insertion rule applies (as shown in (36a)). Do-insertion, like its French counterpart main-verb movement, applies as a **last resort** in order to save the derivation, as stipulated by conditions of economy. This takes the flavor of saying that the 'least effort' is to be achieved whenever possible to form a derivation, with only formal features which drive movement activating any structure above VP.

When features are **incorporated** (strong), there is no way to decompose the feature from the stem. There can be no bare verb stem in French such that [parl-] ever goes detached from a potential affix. (Spanish shows this quite nicely whereas the stem [habl] (speak) is completely unpronounceable, let alone recognizable). In other words, in the late insertion case, once the lexical item makes its way through to the phonology (or Phonological Form (PF)), there is no way to later decompose the stem

from the affix. An English late insertion case in point might be the English noun 'children' which must remain undecomposed (i.e., where the plural number is not affixal but is rather incorporated into the irregular stem. A process similar to what we find in morphological **lexicalization**). There is no processing mode available which would allow the separation of the stem [child] and plural affix [(r){en}]. The two components come into the lexicon and through to PF incorporated as one single lexical stem [children], as what might be found with other English irregular-affixes or even regular auxiliary-verb stems (be/is/are/was/were). The distinction here is what is largely behind issues regarding the **Dual Mechanism Model** (DMM). (See Pinker 1999, Clahsen 1999 for a review. Also see Galasso 2003 for a DMM treatment of child language syntax).

[Step 2] Regarding scan/array—a kind of search, look-up, and indexing—following Chomsky, we will assume that such operations are inherent and come for free out of language design. Such operations, at least on an auto-semantic/associative level, may even be cognitive-based to a certain degree (and not entirely language-based). The fact that we can scan our environment and classify the world around us based on features, patterns and generalizations may very well be a precursor to linguistic scan. For instance, before the onset of the class of determiners/demonstratives (the/this/that) enters into the early child's language structure, finger pointing may be cognitively available in order to share a point of attention between the child and a second on-looker. Once demonstratives enter into the language structure, such pointing may decrease. Likewise, along with scan, we'll assume that Merge (which takes place at the next step just after scan) is also likely to be inherent (free), acting as the bricolage of language building: the act of combining one [stem] onto another [stem] as found in lexical compounding (e.g., [[$_{Adj}$black][$_{N}$bird]]), or where merge strings two independent words together and forms a simpleton phrase (without recourse to movement) (e.g., [VP [$_{V}$ eat] [$_{N}$ cake]]). However, the simple merging of two items (as with compounding), say of [α, β] is not enough—some additional structure and/or computation must be assigned to serve as a guiding template whereby the newly merged twin items create a larger single item [T [α, β]] where [T] is the template given by way of computational design. This is the so-called labeling problem: viz., when two items come together and form a third item, how do we name that third item? This is an important matter given that the labeling of two merged items is what defines a non-sisterhood status of 'Head' of a merged binary operation: e.g., [α [α, β]] so that a moved item {α} yields 'Head-α' of the 'α-Phrase'.

[Step 3]. Phases (Phrases)—i.e, 'pieces of syntactic tree diagrams'—are newly interpreted as 'neuro-templates' which must satisfy natural economy conditions. In fact, we can claim that syntactic pieces of the phase/phrase (a 'treelet' structure) can now serve as part of a singular template for language reception and processing—similar to how the 'native language magnet theory' would propose an inner template which catches, stores and allows production of speech sounds (e.g., Kuhl). (See Janet Dean Fodor's seminal 1998 work on treelet structures regarding parameter setting and 'unambiguous triggers'). Language perception and processing actually

come out of template economy conditions themselves—ie., parsing at LF is made possible by local derivations which stipulate (by the nature of language design) that derivations of language proceed along the template bottom-up, phase by phase, with the prosaic VP serving as the first way-station along the template path of economy of derivation. Bottom-up phrase/phase development will first seek out Merge as its bricolage brick-builder of language since it comes for free, and only later seek out MOVE of phrase/phase development since we'll assume that MOVE comes at some minimal expense (if not theoretical, following Chomsky's recent work on unification (Chomsky 2001; 2005) where he suggests that both Merge and Move come for free out of language design, than at least there is a cost regarding +/- transfer to Full Interpretation. For instance, there is strong evidence coming out of language acquisition research that children carry out Full Interpretation (FI) within a structures/phases when adults do not. The notion behind FI will be discussed within the framework of movement—viz., that MOVE delays transfer to FI (citing the work of Tom Roeper). Our task herein will be to see if children's putative early interpretations of structures on an exclusive semantic-level—and at the expense of what would be a norm syntactic-level interpretation—is a result of their lack of movement (what we shall come to term 'sudden death'). We will come to consider, for example, why children might reduce an otherwise FI syntactic-reading of the structure [DP bottle of wine] to a semantic-reading of the structure [N/adj wine bottle]. Another aspect of MOVE coming at some cost may be more simply that MOVE requires much more in the way of working memory, or may require additional mechanisms which deal with the checking and removal of formal features undertaken at early/weak affix attachment.

[Step 4]. By default, the most economical of derivations shall apply at all times (namely Merge). Language parsing should proceed on the template in way of the shortest string possible and at the very earliest phase possible, and with recourse to the minimal working memory possible. So economy has a vertical and horizontal feel to it, dimensional of space and time. If language can be satisfied at the lowest VP level, there should be no other reason for upward mobility (up the syntactic template), otherwise we enter into a theory-internal domain, stripped of principles of economy. To a large degree, the MP is an attempt to explain why one language structure might opt for a more resistant path over a more economic path (in the spirit of Ockham's razor). As it turns out, there are other artifacts which go well beyond mere economy principles of language. They may be epiphenomenal and reliant upon other language or non-language devices, but in any case, such artifacts as they enter into the language processing realm will have to be fleshed-out and an account will have to be argued for their continual existence in an otherwise unwanted field. To name just a few, seemingly artificial artifacts such as the EPP, 'strong vs. weak' feature strength driving upward movement and the like come to mine. These may turn out to be epiphenomenal features, with their functionality serving as a requisite to some other function. The fact that such features show-up in language, however, still has to be addressed. Following through with this epiphenomenal story, the fact that languages differ with regards to 'weak vs. strong', AGReement vs. non-AGR, etc. may suggest that such features can't be tied to mere cognitive factors since

human cognition is invariant in its manifestation. Such distinctions in fact place the burden of explanation away from cognitive capacity and squarely onto an autonomous language design, much in the spirit of Chomsky's notion of an innate language organ. The fact that such distinctions mainly show-up only with regards to formal features is interesting in this respect and justifies parameters of language being tied to functional categories. In other words, we only find language variation in those artifact areas of language which deliver formal, abstract properties.

[Step 5]. Regarding economy of derivation, if the language string cannot apply its derivation at the lowest template level (VP/vP), then movement of the string upward must apply in order to save the derivation. The default therefore shall be that all utterances are simpleton VP/vPs until otherwise argued for their required upward movement. An argument will suggest that discourse material (e.g., any interrogative or negative polarity feature, topic & focus and/or other types of illocutionary force) is such that movement is required out from the lower VP. In fact, we shall assume the working hypothesis that all movement is somehow related either to (i) **discourse** or to (ii) a **feature-checking** of **AGR**eement /AGR (following the work as laid out in Miyagawa (2010)).
Let's take each in turn.

3.2 Legitimate Objects.
Select lexical items. All lexical items begin as legitimate 'syntactic objects', but their 'word-categorical' status is yet to be defined here. By default, we could claim at this very early stage of language processing that all proto-items begin (universally) as potential 'complements' (predicates).

Items become syntactic objects. An item's **identity status** (of what we typically call Noun, Verb) must wait to be defined by a second operation (the first operation being the formation of a numeration of syntactic objects) whereby the syntactic objects become **combined** via **merge.** Since we are dealing with the very early and primitive stages of phrase structuring, and since what we term a 'phrase' as that which is determined only by its member (the syntactic objects in question), we will come to term this type of first order merge as **merge/Member**.

merge/Member. Two or more syntactic objects (SO) come together via merge/Member (m).

merge/Member is nothing more than (i) the successful recognizing of two SO items which are to be **pulled** from a numeration/lexicon (the first operation **Pull**) and (ii) their successful combining (the second operation **Combine**). Nothing more other than their combining can be expressed at his second operation point. After merge/Member of the two SOs has taken place, a third syntactic object has now been formed (SO_m) as a result of some **scanning** that takes place between the two objects. **Identification** of the two items in question may have been previously tagged while

in the numeration itself (a kind of default auto-semantic label) but that the actual syntactic categorical labeling of identity must await this third operation called **scan**. So we have three operations here: (i) Pull, (ii) Combine and (iii) Scan. (Scan seems to operate upon a syntactic scaffold whereby a 'look-ahead' tactic might be employed in a generative way to produce the syntactic template upon which words will be drawn and inserted thus rendering syntactic categorical labeling). So now we have a general processing of merge + scan. The question as to which syntactic item becomes a Head or Complement is still not made known by merge/Member (i.e., the combining of the items per se as drawn from the numeration) but rather must await a third operation. In order to determine syntactic Heads/Complements, a third **scanning** operation must be employed in the overall processing—following that first operation 'Pull', and second scan-operation 'Combine'—whereby activation somehow can interpret the two SO items within merge/Member as either [+/-Head] (with the complements following as a default setting of [-Head]). Such knowledge of [+/-Head] is part of our tacit knowing a language—what is referred to as innate Universal Grammar. To a large degree, the notion of Noun vs. Verb is hard-wired in the human brain/mind and comes to us as a child freely as we begin to build our array of language merges. Again such knowledge, if hardwired, by come for free from out of the numeration. Nonetheless, such ready-made labels are easily made variable based on top-down syntactic configurations (e.g., nouns can turn into verbs, etc.). Such top-down Scan Operations thus confirm to us our scope and logic of natural language (Logical Form/LF). The flipside to this would be to say the LF itself is in fact the scanning devices. In this interpretation, LF comes to us for free out of the very language design. There is a certain flavor of truth to this speculation: the Logical Form of language is the most basic of economic principles and is perhaps the most beholden to language universals: it seems to be an inherent, autonomous property of language and may in fact be all together detached from phonology, syntax and semantics.

So then, Merge is considered an innate property of language (out of design) whose job is to take two or more SOs and establish a phrase. A phrase level can only be achieved once [+Head] has been selected. Hence, merge is seen as an economy condition in order to satisfy what is required of a phrase. The two SOs then become visible as a derivation at LF, again satisfying conditions placed on language. SOs can then converge at LF/PF. All economy conditions up to this point have been met.

Then what, when conditions of convergence are not met? Perhaps as a proto-language, the simple merge of SOs would have sufficed—no movement would be required (e.g., Bickerton 1990). So epiphenomenal to any proto-language, additional conditions must apply rendering the necessity of **upward mobility.** The proper term is **MOVE**ment. Whenever a derivation cannot be satisfied at the most prosaic phrase-level (place) and at the earliest point of derivation (time) (= VP/vP), then movement of the SO up the **syntactic tree** ensues. (Of course the converse applies: if movement can be delayed or not even activated, conditions of economy say there should be no movement. This economy conditions has been labeled **Procrastinate** in UG terms. If movement can at all be delayed, until after spell-out, than post-spell-out

movement doesn't affect phonology (PF) This is the nature of how one should think about conditions of economy of derivation within a UG framework).

The classic syntactic tree here—while in the past utilized as a model for linguistic theory—is presently conceptualized as a **neuro-linguistic template**. It is the actual template that generates language (not conversely). MOVE is most typically motivated by the need to check-off superfluous features (f) which may not impinge on LF. These SO features (SOf) are referred to as formal (or un-interpretable) and the role they play in language is still full of controversy. Questions as to why they even appear in nature language as part of any Darwinist evolutionary design of language remain unapproachable. Nonetheless, we have plenty of instances of SOf in natural language and must deal with them. What seems to be at word, bade apparent by language design, is that SOf must move up the syntactic tree in order to remove these formal features before the utterance can make its way to convergence at LF. Thus, **feature checking** drives movement. Recent neuro-linguistic evidence can now confirm that movement is not just a nice linguistic metaphoric, but that it is absolutely psychological real, with movement of SOs showing –up in fMRIs.

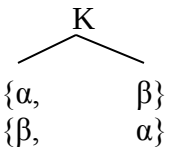
3.2.1 First instance Merge: —'The World is Flat'.

One of the most basic universal underpinnings of syntax is that of binary Merge: where element α has to somehow merge with β, yielding a Set (S) S= {α, β,}.

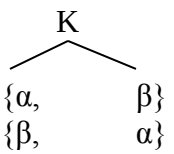
(37) Merge S= {α, β,}.

In the first instance merge, this is all well and good, but, due to symmetry, no directionality comes of it—i.e., there is no intrinsic hierarchy since both elements would equally share in sisterhood status ({α, β} are sisters). In other words, the 'world is flat'. But such flat equal-status sharing won't do since word order is a very basic principle of language design, and word order requires some dominance control (K) over the labeling of the phrase—viz., one of the two sisters must be promoted to having a step-mother status.

(38) Step-*1: 'merge/Member'*



(39) merge/Member yields Sets:



Sets:

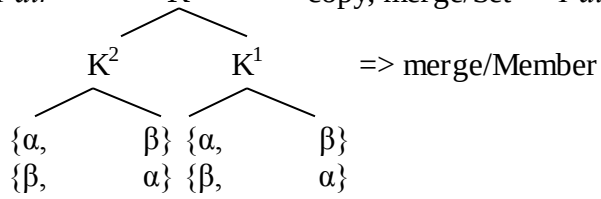
⇨ {α, β} {α, β} {α, β} {α β}…
{β, α} {β, α} {β, α} {β, α}…

Here, in step-1 of merge/Member, K = Set {α, β}{β, α}… whereby—and out of design of computational process—the two selected items of S(et) hold sisterhood and immediate contain status—with 'sisterhood' defining their symmetry, and 'contain' defining the fact that the two objects make-up S. Let's go on to call this merge/Set since what we have is the merging of Members in creating a Set. However, merge/Member → merge/Set still does not yield a dominance-relation naturally out of design (there still is no hierarchy). No matter how many multiple 'merge/members provide for Sets, these are still 'flat' sisterhood structures. To a degree such flat structures can provide for the stacking-up of one item on top of another, though still, in theory, there is no hierarchy (the stacking would have no order, unlike how hierarchical adjectival structures do have order, e.g., *the 'red brick' hou*se, **the 'brick red'* house). Such adjectival ordering would therefore require a hierarchical scheme not otherwise made available via a simple merge/Member operation. (We'll come back to this point). Multi-flat structures amount to logical {and}: e.g., as in the string 'I bought…a,b,c,d,e,f,g….where any order would suffice (I bought…a,g,b,c,f,e,d…). So, *I love 'mom and dad'* is the same as I love *'dad and mom'* (under this flat-structure analysis) but not the same as the wild unordered *Dad I mom love and which speaks to the notion that subject-verb I love and verb-objects love mom, dad must have a hierarchical status in that each constituency must configure as a Headed Phrase.

3.2.2 Scan.

In order to break this sisterhood ambiguity, a 'giant leap forward' (in human evolutionary terms) is required which can break with logical <and> and provides us a template into hierarchy. We'll term the structure of this paradigm shift 'merge/Set' whereby the Set(S) is now accompanied by copy(S) (a sort of basic movement operation).

(40) Step-*2: 'm*erge/Set*'* → *'Pair'*



But before we can select which items of (K^1) will be copied onto (K^2), a kind of scan operation must select and tag the syntactic object a license to move. Recall that within the {α, β} set, making-up the {α, β}, {α, β} pair, only one item will copy (not two) and one item will be left behind, rendering {{α}, α, β}. Such tagging provides a license for which item will undergo movement. Thus movement is a direct result of the **operation scan**.

Now, with this 'paradigm shift', what we have is a 'structural arrangement' whereby a copy (of two members) can be duplicated and serve as a host (landing position) for a moved elements (not unlike what we find with gene splicing/copying, a reference made in the abstract). By 'copy', what we mean is that a syntactic object has been spliced and moved, with features now shared between two locations. In short, some sort of Movement with chain… is required for K^2 to establish itself (though, there may be room to distinguish here between 'true syntactic movement' and what we'll come to call fake-raising, with the latter only involving a shadow-copy whenever the 'moved' item is merely adjoined to itself and where its thematic-argument structure remains binding. This is a form of 'semantic movement' which is what is spelled-out in step-2 of merge/Set above. (Recall our discussion above regarding 'adjectival stacking'. Well that too would involve a kind of semantic/local movement as made available via merge/Set. Merge/Set may in fact take-on fake raising qualities which we'll return to later on in the text). We later may also wish to distinguish this kind of 'copy movement' from true 'syntactic movement' (the former associated with a Merge-base probe-goal relation, and the latter with a Move-based probe-goal relation). Otherwise, if no Movement were activated for K^2, simply adding a new K would suffice, and hence, we'd be doomed to recycling flat structures. (In this sense, K^2 is actually prime K' of K^1). So, any element which undergoes Move must contain a memory index of their lexical specific features so that if copy is activated, a chain can be formed. Raising (via movement) is in fact a 'chain-forming' mechanism which allows a copy of the raised element to persist lower down in the tree. In this way, if, say, '{α}-feature' raises, then {α} dominates {β} and fixed word order is possible.

3.3 But what motivates Copy/MOVE?

In short, (with a fuller discussion to follow), the construction of functional phrase requires Copy/MOVE. In one sense, inherent in the very notion of the label 'functional feature/phrase' is the notion of 'Move'. Lexical phrases may likewise involve a kind of movement as well, but only a movement of a very different nature in that lexical phrases adhere to **locality of movement** (what we term as **Merge**). Functional categories both spawn and are the result of true movement. Following Miyagawa's 2010 seminal work here, we likewise claim that (i) 'narrow syntax' is to be defined by a true Move/recursive operation, and that (ii) the probe-goal relation behind Move is to establish a link between the (functional) recorded copy and the (lexical) original position of the moved item/feature lower-down in the argument structure layer of the tree. Working bottom-up within the tree, the Probe-α reaches down for a Goal-α within the argument layer of VP in order to pull up a Syntactic Object SO-α so that SO-α can copy and record itself onto a higher phrasal projection. In other words, Move operations capture this link between a distant SO lower-down and its recorded copy higher-up in the syntactic tree. That's it. The chain (Binding) between the two elements is seen as the residual artifact of this movement. Now what we will have to eventually claim here is that there are two modes of probe-goal relations: both of which seek a kind of copy/record mechanism but where only the local probe-goal is near enough so that no inherent copy/record need be recovered.

This is what we will call **local/Merge (Semantic)**, as understood within theta-marking (VP structures, argument-structured binding such as reflexives as well as lexical compounding). However, the second probe-goal relation of **distance/Move (Syntactic)** is what we will mean when we speak of true movement analogies.

A Note on Phrase. In theoretical terms, the formation of a phrase comes to us as a bi-product of a syntactic **chain** (of a moved item: either Move or Merge). Whenever probe-goal is Move-based, than the phrase is said to be **functional**, as the phrase is equated with non-interpretable [-Interp] formal features. Whenever the probe-goal is Merge-based, than the phrase is **lexical/thematic**, as part of [+Interp] feature specificity. Hence, a functional phrase (with all its classical trappings) is nothing more than a syntactic Agreement (AGR) relation whereby a second order **probe-goal** relation holds between (i) a singular item and its formal position higher-up in the phrasal tree and (ii) the feature properties of the item to be moved. (A first order probe-goal relation would be thematically housed within VP not motivating movement). We spell out here the above notion of a **dual probe-goal relation** which contains two distinct operations (although both forms create phrases):

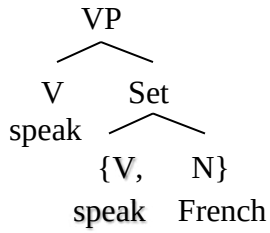
3.3 1 A Dual Probe-Goal relation:

Semantic Probe-Goal: merge/Set.

'merge/Set' (= external/Merge) involves three syntactic objects: {α, {α, β}} (the item which moves forms the Head). The rending of a **Lexical Phrase** is now permitted with hierarchy as sisterhood status is now broken.

⇨ Lexical Phrase-Level: a local/Merge operation (first order):

(41)



[VP V_i [Set: {V_i, N}]]

Token example: [Daddy [VP speak [Set: {V speak, N French}]]].

(Such a structure might be uttered by a child at an early multi-word Tense-less stage-1 of acquisition, say, at roughly 18 months of age.)

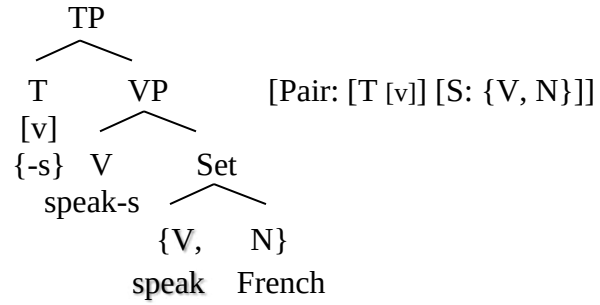
Syntactic Probe-Goal: **merge/Pair.**

'merge/Pair' (=Move) involves three syntactic sets and renders a **Functional Phrase** via a pair of sets:

{α, β}, {β, α} and {α, {α, β}} or {β {β, α}}.

⇨ Functional Phrase-Level: a distant/Move operation (second order):

(42)



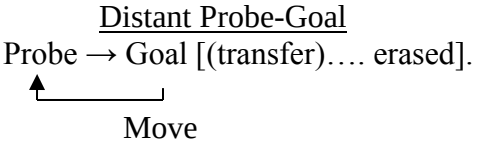
Token example: [TP Daddy [T [v] {-s} [VP speak-s French]]].

In the structure above in (41), configured by a semantic probe-goal configuration, the verb embedded within Set: {V, N} is said to break sisterhood relation and, via merge, move onto itself thus creating a Verb Head, VP. As can be seen, the notion of 'move' here is strictly local (therefore notated as Merge—viz., local move = merge). Extended this configuration to developmental syntax, our claim will be that the earliest stage of child language syntax is essentially merge based. We'll come to consider stage-1 syntax as a kind of bricolage whereby the stacking syntactic objects proceed on top of one another in order to break the even more primitive binding of flat sisterhood structures (which could be referred to as degree-0 syntax, as found in children at roughly 18 months of age (a syntactic stage-0)).

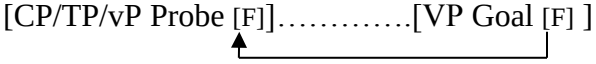
The more advanced structure in (42) would go beyond merge and lead to 'true' movement applications either at the morpheme-level (such as affix hoping lowering/raising or word-level movement).

Miyagawa (p. 32-33) goes on to assert that the two modes of probe-goal relations parallel that which we find regarding the same parallel between AGR vs. Theta-marking. The distinction between the two is that AGR employs a probe-goal relation at a distance (CP/TP searching down into VP) and Theta-marking employs a probe-goal relation always locally (within VP).

(43)



'Move' keeps record of Functional [F]eature relation:



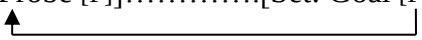
(44) Local Probe-Goal

Probe → Goal

Merge

'Merge' keeps record of Lexical [F]eature relation

[VP Probe [F]]…….[Set: Goal [F]]



By moving the Goal [F] to the Probe, human language has evolved a device which can keep a record of functional relations between the semantic/interpretation (lower-down in the syntactic tree) and the functional expression (higher-up the tree). In a sense, Move keeps a record of the probe-goal relation since the probe of a derivation—before it reaches semantic interpretation—must be erased (Miyagawa: 33).

Regarding this dual probe-goal relation, we can pursue this route with a bit more clarity as to what kind of phrase gets generated, and what the role of the specific phrase is. Recall that we assume that AGR and MOVE are related in the sense that the relationship is what drives tree expansion (upward)—by creating Head-to-Head percolation of features. But what of Case, a traditional functional feature housed within a functional phrase: How is Case generated? Certainly, whatever we make of Case, we have to assert that it is the structural result of merge/Pair and that some movement is involved on a syntactic level. By taking the above tact, what we can say is that Case is generate (above VP) within a light verb (vP) by suggesting that the item/(subject), bottom-up, moves up the syntactic tree to Spec of vP in order to check-off a formal Case feature there within vP, or else enter into some kind of a top-down Probe-Goal relation within vP. (*Note. We crucially assume here, contrary to most theoretical assumptions, that Case is assigned within vP, a phrase which straddles both the lexical/functional domain, since Case likewise seems to straddle both domains: inherent case is lexical thematic, whereas structural case is functional). A treelet structure then would provide the configuration for Case/vP. Theory internal assumptions might also mark Case as having a hybrid +/ interpretable status since Case seems to behave both lexically/semantic in terms of argument structure/inherent case, as well as functionally/syntactic in terms of structural case. Accommodating this hybrid approach, we'll assume that Case has a two-prong configuration:

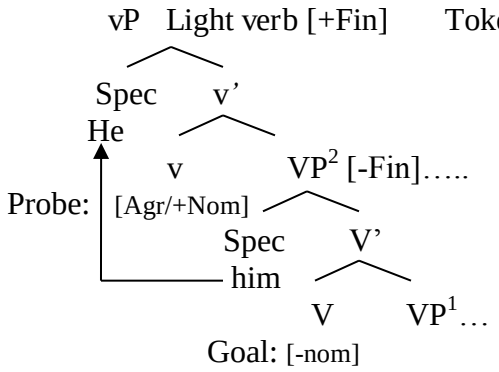
(45) (i) Case (structural): when functional generates under vP with an appropriate syntactic Probe-Goal relation specific to the Head of vP showing [+Finiteness] properties. (Heads of light verbs mark for [+Nom] Case).

(ii) Case (inherent/default): when lexically generates under VP with an appropriate semantic Probe-Goal relation specific to the Head of VP showing [-Finiteness] properties, (or when marked as default).

In any event, both procedures of Case will be the result of one of two versions of move: (46) when syntactic—move (whereby *v'* of vP carries a [+Nom] feature), (47) when semantic—merge (whereby V' of VP carries a [-Nom] featurue). Structural/Functional Case is an Internal MOVE operation since [+Nom] must enter into a syntactic Probe-Goal relation which is MOVE-based. Let's consider below how the treelet structures might capture syntactic Case within the framework of Merge over MOVE:

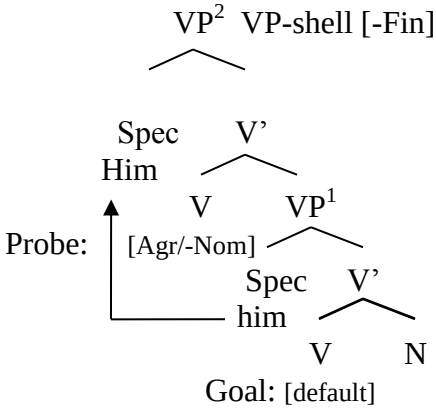
MOVE Structures for Case:

(46)



Token example: He speaks French.
{He: [Agr/ [+Nom]}

(47)

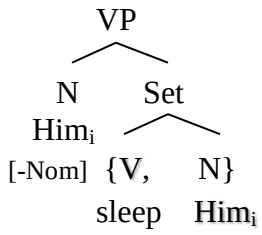


Token example: Him speak French.
{Him: : [Agr/[-Nom]}

Regarding Merge over MOVE, one interesting implication here is that Case is the pure result of MOVE, not Merge.

However, what of semantic/inherent case—e.g, as in an intransitive 'I saw him sleep'? Here the syntactic item in question of move could proceed in the first instance via local merge, as was seen with the verb moving out of Set in order to break sisterhood status (Ex. (41) above):

(48)



[VP N_i [Set: {V, N_i}]]

(Token example: I saw [VP Him [Set: {V sleep, N him}]]

(Note: such a structure might be uttered by a child at a Case-less stage-1 of acquisition, at roughly 18 months of age. Note we assume that all propositions begin as default predicate VX (VS, VO) structures. Subsequent merge and/or move operations follow).

In summary, we can trace the above following paths of a derivation:

(i) An utterance begins as a flat sisterhood structure in the way of a Set.
(ii) Merge breaks sisterhood status—the product of which may deliver inherent/semantic case, or some lexical headed phrase.
(iii) Move takes merge one step further in order to deliver Agreement and syntactic Case.

Note here that local merge could capture both 'sisterhood escape' having to do with Tense and Case. At our proposed degree-0 syntax stage, 'sisterhood escape' would not even be possible and no hierarchical status could be delivered to make even the otherwise most prosaic tense-less/case-less structures.

But what of Tense? Is Tense MOVE or Merge based? Well, as a traditional functional category, Tense might be the exception to the otherwise rule which states that all functional categories result from internal MOVE. We know that some displacement/movement must take place for Tense, but which: internal or external? Well if we can imagine such treelet structures being partial Heads, parts of free floating trees (and autonomous), than we might device a theory which states that the TP (Tense Phrase) Head T of TP attaches (top-down, as in an **adjunction process**) via merge to the lower vP>VP, thus allowing a spec position for a vP case marked subject to raise up and position with Spec of TP in order to satisfy a theory internal stipulation that calls for all clauses to have a subject as defined by the Extended Projection Principle (EPP). (We'll assume, following Kayne's work, that Specs are simply adjunct branches which naturally form from out of Heads, and that there could be in fact multi-specs branching out of a single Head). Then such a detached

TP itself would serve as a Probe (a phrasal probe) looking for its Goal (as a Head seeks out a Complement within a phrase).

Let's following the merge sequences below for Tense:

Merge structure for Tense:

(49) T' → merges with vP… → rendering TP (= EPP)

T

Probe: [Tense]

Spec T'

product of merge → T vP…..

Spec comes for free via adjoin.

There is some support for such a Merge treatment of Tense given that Chomsky has recently reclassified TP as both 'non-phasal' and as having [+Interpretable] features, unlike vP which is considered a phase and to some degree [-Interpretable].

So now we have a Merge-structure TP which sits via 'adjoin' on top of a MOVE structure vP:

(50) Merge TP > MOVE vP > Merge VP….

CP, also a MOVE-based Phase, would then finally sit on top of merged TP:

(51) Move CP > Merge TP > Move vP > Merge VP….

(Note that cyclic 'merge-to-move-to-merge-to-move' bottom-up progression. It is of some interest to suggest that Cyclic Movement may be captured by such an alternating 'move-merge-move' alteration).

This is all well and good: crucially, any such probe-goal relation could fall within either Merge or Move. Fine! But in the first instance, which of the two elements should raise, say, from out of the lexical Probe-Goal Set S: {V, N}? Well, here it must be said that some element must contain lexical/functional specific information (function-argument info for the former and syntactic info for the latter) that requires the given lexical/functional feature to raise—so that if {α}-feature raises, then {α} dominates {β}. Otherwise, if there is no raising, than only sisterhood relations can hold with no dominance/word order. Note that even within the VP-shell, some hierarchical structure is mandated (as is seen in ergative predicates, such as our 'rolled the ball' structure below which too is a VP-shell construction).

To be clear here, what we are saying is that whenever there is a phrase, with its proper infrastructure containing a Probe-Goal or true Spec-Head-Complement configuration, then there must have been some movement operation in order to break the otherwise flat (and by definition) non-phrasal sisterhood status and gain hierarchical structure. If the moved item in question is lexical—i.e., an item entering either a lexical Probe-Goal or lexical Spec-Head-Comp configuration—than a lexical phrase is created (NP, VP, AdjP, PP). If the moved item is functional—i.e., and item entering into a syntactic Probe-Goal or Spec-Head configuration—than a functional phrase is created (CP>TP>vP). We crucially note here that it is AGReement/Move that drives tree expansion (upward), and that creates all anti-sisterhood chains (where sisterhood chains might resemble what we find in pure reflective structures—e.g. $John_i$ washed $himself_i$, where John and himself are one in the same person and the verb washed serves as a kind of linking verb, connecting subject with object).

Before we go on to take a closer look a merge/Set, let's recap what is at stake here regarding movement and anti-symmetries found in natural language.

4. Data

One of the most dominate themes captured in syntactic theory has been the notion of movement. Still very little is known about how movement develops over time in child language, or, cross-linguistically, how its rate of development is pegged to languages with rich morphologies. Researchers of child language acquisition have long noted that children pass through developmental stages of grammatical morphology, with the early multi-word stage showing 'variable' and 'optional' production rates of morpho-syntactic inflection. Accounts range in the literature from phonological deficits, where prosodic development may be a factor, to semantic or syntactic under-representations, where features may go un-specified. Specifically, one current syntactic model suggests that such variable delays are, to a large degree, 'optional' due to incomplete inflectional representations of features (Wexler, 1994). While we are in agreement with the general account that Wexler lays out for us, we ague contra Wexler from our own previous work done showing that there exists an even earlier stage during which children have complete 'non-access' to inflectional morphology.

The present paper, based on a longitudinal case study of an English speaking child, covers the acquisition of movement and extends its analysis to properties of inflectional morphology as well as to word order. We examine the role the absence of 'Move' might play in accounting for the early appearance of morpho-syntactic and word order violations. Regarding word order, initial simple merge-operations which yield structures like cup coffee [[N cup] + [N coffee]] can then target dual move-operations instigated by Inflectional Phrase (IP) structures accordingly:

(52) i. Merge [[N cup] + [N coffee]] → Two lexical items merge: cup, coffee
ii. Move-1 [IP cup_i [I' of]… [cup_i] [coffee]]→ Genitive
iii. Move-2 [[IP $coffee_i$ cup] of $coffee_i$]→ Adjectival (derived from Genitive)

Both structures such as cup of coffee and coffee cup require a higher clitic position as a result of a movement operation from the base merge [cup, coffee] (Roeper, 1999). Adult English uniquely allows for both a move-2 compliant structure e.g., wine bottle (=adjectival) and a move-1 compliant structure bottle of wine (=genitive), but not bottle wine. Any 'non-compliance of movement' would then account not only for our attested child word order deviance of the type cup coffee found in our data, but also allow us to account for the wide array of mixed word order found amongst early SV, VO 'single argument strings' (where only merge is said to apply), with late acquired 'double argument strings' thus targeting a position created by move and triggering correct SVO word order. Other ubiquitous examples come from 'affix-hopping' where verbal/nominal inflection is seen as a result of movement e.g., *Tom's book* [IP Tom [I *'s*] book], drinks milk [IP drink] [I {s}] milk] (Kayne, 1994). The proposed theoretical model presented in this paper shows how the delay of both word order and inflectional morphology alike follow from a protracted development in which 'Merge' operations emerge in the child's grammar slightly ahead of 'Move'—a 'Merge-first' over 'Move-later' account of syntactic development.

4.1 Inflectional Morphology

Two-and three-year-old children generally go through a stage during which they sporadically omit possessive 's, so alternating between saying (e.g.) *Daddy's car* and Daddy car. At roughly the same age, children also go through a stage (referred to by Wexler 1994 as the **optional infinitives** stage) during which they sporadically omit the third person singular present tense +s inflection on verbs, so alternating between e.g. Daddy wants one and Daddy want one. The question addressed in this paper is whether children's sporadic omission of possessive *'s* is related to their sporadic omission of third person singular present tense s—and if so, how. This question is explored in relation to data provided by a longitudinal study conducted by Joseph Galasso of his son Nicolas between ages 2;3 and 3;6 (based on transcripts of weekly audio recordings of Nicolas' speech production).

Nicolas' speech production provides some prima facie evidence of a relation between the acquisition of possessive 's and the third person singular s: prior to age 3;2, Nicolas used neither possessive *'s* nor third person singular s in obligatory contexts; it is only from age 3;2 on that we find both morphemes being used. The table in (53) below shows the relative frequency of use of possessive *'s* and third person singular present tense s in obligatory contexts before and after age 3;2:

(53) OCCURRENCE IN OBLIGATORY CONTEXTS

AGE	3sgPres s	Poss *'s*
2;3-3;1	0/69 (0%)	0/118 (0%)
3;2-3;6	72/168 (43%)	14/60 (23%)

Typical examples of nominals and clauses produced by Nicolas at the relevant stages are given in (54) and (55) below respectively:

(54) (a) That Mommy car (2;6). No Daddy plane (2;8). Batman (2;11 in reply to Whose it is?). It Daddy bike, no Baby bike. Where Daddy car? (3;0).
(b) *Daddy's* turn (3;2). It's the *man's* paper (3;4). It's *big boy Nicolas's*. It's *Tony's*. What's the *girl's* name? Where's *Zoe's* bottle? (3;6)

(55) (a) Baby have bottle (2;8). No Daddy have Babar (2;9). The car go. (2;11). The other one work (3;0). Here come Baby (3;1).
(b) Yes, this works. This car works. It hurts. The leg hurts. Barney leg hurts. It rains (3;2).

The data in (53-55) suggest a potential parallel between the acquisition of third person singular +s and possessive 's, and raise the obvious question of why there should be such a parallel.

From a morphological perspective, such a parallel would not be unexpected, given that possessive *'s* and third person singular s (e.g. the contracted form *'s* of the auxiliary is) have the same range of overt allomorphs, as we see from (56) below:

(56)

ALLOMORPH	AUXILIARY	POSSESSIVE
/s/	Pat*'s* coughing	Pat*'s* cough
/z/	Teddy*'s* coughing	Teddy*'s* cough
/iz/	Madge*'s* coughing	Madge*'s* cough

Moreover, there are also potential syntactic parallels between the two. Under the analysis of clause structure assumed in Chomsky 1981 and much subsequent work, a clause such as Pat's coughing would contain an IP projection of the simplified form (5) below:

(57) $[_{IP}$ Pat $[_{I}$'s] coughing]

with *'s* encoding both present tense and agreement with a third person singular subject-specifier like Pat. (See Galasso 1999 pp.126ff for an alternative account showing the verbal morpheme +s as exclusively marking Tense). Under the analysis of possessive structures in Kayne (1994: p. 105), a nominal structure such as *Pat's cough* would likewise contain an IP projection with the simplified structure (58) below (with I being a nominal rather than a verbal inflectional head):

(58) $[_{IP}$ Pat $[_{I}$'s] coughing]

and it might be argued that *'s* serves to encode agreement with a third person singular subject-specifier like Pat. (Similar analyses of English possessive structures are found in Chomsky 1995 p. 263, Zribi-Hertz 1997, and Radford 1997 p. 278). This is by no means implausible from a universalist perspective since we find a variety of languages which overtly mark possessor agreement: languages as diverse as American Sign Language, Dutch and Turkish have possessor agreement structures paraphraseable in English as *'Daddy his car', 'Mummy her car'.*

If both possessive *'s* and third person singular s are reflexes of an agreement relation between an inflectional head and its specifier, an obvious suggestion to make is that omission of third person singular s and possessive *'s* may both reflect agreement failure (i.e., failure to encode the agreement relation between an inflectional head and its specifier). In the terminology of Schütze and Wexler (1996) and Schütze (1997), s-less forms may be the result of the relevant inflectional head being **underspecified** with respect to the specifier-agreement features it carries. In simplified schematic terms, we might say the clausal structures like *Mummy's driving* contain an IP of the simplified form (59a) below (with INFL carrying agreement features matching those of its subject-specifier), and the corresponding s-less clause Mummy driving has the partial structure (59b) (with INFL being underspecified in respect of its subject-agreement features):

(59) (a) $[_{IP}$ Mummy $[_{I}$ +agr 's] driving]

(b) $[_{IP}$ [Mummy $[_{I}$ -agr ø] driving]

In much the same way, we might suggest that possessive structures like *Mummy's car* contain an IP projection like (8a) below headed by an inflectional node fully specified for agreement with its possessor-specifier Mummy, whereas s-less possessives like Mummy car contain an IP projection like (8b) below with an inflectional head which is underspecified with respect to agreement with its possessor-specifier[2]:

(60) (a) $[_{IP}$ Mummy $[_{I}$ +Agr 's] car]

(b) $[_{IP}$ Mummy $[_{I}$ -Agr ø] car]

A further assumption implicit in the above analysis is that *'s* is only used where INFL is fully specified in respect of its agreement properties; otherwise, INFL is null.

The assumption that s-less forms may be the result of agreement underspecification has interesting implications for the case-marking of the specifier in both nominal and clausal structures. Schütze (1997) argues that there is a cross-linguistic correlation between case and agreement (e.g. that an INFL which is specified for subject-agreement has a nominative subject). Making rather different assumptions from his (for reasons which do not affect the conclusions drawn here), let us suppose that adult English has the following case system:

(61) An overt (pro)nominal is:
(a) nominative if in an agreement relation with a verbal INFL
(b) genitive if in an agreement relation with a nominal INFL
(c) objective otherwise (by default)

If we assume (following Schütze and Wexler) that children have acquired the morphosyntax of case and agreement by around two years of age, and that two and three-year old children go through a stage during which functional heads are optionally underspecified with respect to the features they encode, we can provide a straightforward account of why two-and three-year olds alternate between forms like I'm playing and Me playing. The two types of clause would have the respective (partial) structures (62a/b) below:

(62) (a) $[_{IP}$ I $[_{I}$ +agr 'm] playing]

(b) $[_{IP}$ Me $[_{I}$ -agr ø] playing]

Since INFL is fully specified for agreement in (62a), the overt auxiliary *'m* is used, and the subject is nominative by (61a). But since INFL is underspecified with respect to agreement in (62b), it remains null and has a default objective subject by (61c).
If—as suggested in (62a/b) above—possessive nominals contain an IP headed by an INFL that may either be fully specified or underspecified for agreement, we would expect to find a similar alternation between nominal structures like (63a) below with genitive possessors and those like (63b) with objective possessors:

(63) (a) $[_{IP}$ My $[_{I}$ +agr ø] dolly]

(b) $[_{IP}$ Me $[_{I}$ -agr ø] dolly]

In (63a), INFL is fully specified for agreement with its possessor-specifier and so the possessor has genitive case by (61b); but in (63b), INFL is underspecified for agreement, and so its possessor-specifier has objective case by (61c). In both structures, INFL is null because 's is used only where the specifier is third person.

In short, the assumption that children's possessive structures may optionally be underspecified with respect to agreement predicts that children who go through such an underspecification stage in the acquisition of possessives should alternate between structures with genitive and objective possessors. The use of objective possessors has been reported for Dutch by Hoekstra and Jordens (1994), but not for English.

If we look at the earliest first person singular possessor structures produced by Nicolas, we find that objective me possessors predominate at ages 2;6-2;8, and that genitive possessives (viz. the weak form my and the strong form mine, with occasional early confusion between the two) are initially relatively infrequent, but gradually become more

and more frequent until they predominate by age 3;0. The table in (64) below shows the relative frequency of objective and genitive possessors used by Nicolas at various ages:

(64) **Frequency of occurrence of first person singular possessors**

AGE	OBJECTIVE ME	GENITIVE MY/MINE	NOMINATIVE I
2;6-2;8	53/55 (96%)	2/55 (4%)	0/55 (0%)
2;9	11/25 (44%)	14/25 (56%)	0/25 (0%)
2;10	4/14 (29%	10/14 (71%)	0/14 (0%)
2;11	5/24 (21%)	19/24 (79%)	0/24 (0%)
3;0	4/54 (7%)	50/54 (93%)	0/54 (0%)
3;1-3;6	6/231 (3%)	225/231 (97%)	0/231 (0%)

Examples of first person/sing possessive structures produced by Nicolas are given below:

(65) (a) That me car. Have me shoe. Me and Daddy (= Mine and Daddy's).
Where me car? I want me car. I want me bottle. I want me woof (2;6-2;8).
(b) I want me duck. That me chair. Where me Q-car? No me, daddy (= It isn't mine, Daddy). Me pasta. Mine pasta. My pasta. In my key. It my (= It's mine). No book my (=The book isn't mine.)
(c) It is my TV. Where is my book? Where is my baseball? Don't touch my bike. I want my key. It's my money (3;0).

In terms of the analysis outlined above, the picture which the data seem to suggest is that the possessive structures produced by Nicolas are initially predominantly underspecified for possessor-agreement, with agreement gradually being specified more and more frequently (until it exceeds the traditional 90% correct use threshold by the time he is 3 years of age).

Interestingly, there are potential parallels to be drawn with Nicolas' use of first person singular subjects. As the examples in (66) below illustrate, Nicolas alternates between nominative and objective subjects in his early clause structure:

(66) (a) I am me. I am Batman. *I*'m sick (2;8). I am Batman.I am Q. I am car (2;9)
(b) Me Q (2;8 = I am Q). Me in there (=I'm in there). Me car (= I am a car)
Me wet (= I'm wet). (2;9)

The table in (15) below shows the relative frequency of I and me subjects in copular sentences:

(67) **Frequency of I/me subjects in copular sentences**

AGE	NOMINATIVE I	OBJECTIVE ME
2;6-2;8	10/14 (71%)	4/14 (29%)
2;9	15/19 (79%)	4/19 (21%)
2;10-3;0	51/55 (93%)	4/55 (7%)
3;1-3;6	105/111 (95%)	4/111 (5%)

In terms of the agreement-underspecification analysis, clauses such as *I'm sick* and Me wet might be argued to have the respective simplified structures (68a/b) below:

(68) (a) $[_{IP}$ I $[_{I}$ +agr 'm] sick]

(b) $[_{IP}$ Me $[_{I}$ -agr ø] wet]

In (68a) INFL is fully specified for agreement and so is realised as *'m* and has a nominative subject by (61a), whereas in (68b) INFL is underspecified for agreement and so has a null realisation and an objective subject by (61c). The data in the tables in (64) and (67) would suggest that subject-agreement is acquired more rapidly than possessor-agreement: this may (in part) reflect the fact that agreement with a first person singular subject is overtly encoded on INFL (by use of *am/'m*), whereas agreement with a first person singular possessor is not overtly encoded on D (which is null).

If we turn now to look at structures with second person possessors, we find that these only appear in the transcripts from 3;2 onwards. The predominant second person possessor form is initially you, but this is gradually ousted by your over the next few months, as the figures in the table below illustrate:

(69) **Frequency of second person possessors**

AGE	YOU	YOUR
3;2-3;4	14/16 (88%)	2/16 (12%)
3;5	7/34 (21%)	27/34 (79%)
3;6	2/29 (7%)	27/29) (93%)

Typical examples of second person possessor structures produced by Nicolas are given below:

(70) (a) No you train. (=It's not your train). No it's you train, no (idem). No you baby, Mama baby. This is you pen (3;2)

(b) That's your car. It's you elephant. It's you turn. It's you kite. It's you plan. I got you plan. Close your eyes. It you house? No it's you house. Where's you house? Where's you bed? Where's your friend? (3;4)

It seems reasonable to suppose that your possessors are genitive (as in adult English), and that (since Nicolas never uses nominative possessors) you possessors are objective. In terms of the analysis proposed here, nominals like your car/you car would have the respective (sub)structures (71a/b) below:

(71) (a) $[_{IP}$ your $[_{I}$ +agr ø] car]

(b) $[_{IP}$ you $[_{I}$ -agr ø] car]

In (71a), INFL is fully specified for agreement with its second person possessor-specifier and so the possessor has genitive case by (61b); but in (71b), INFL is underspecifed for agreement, and so its possessor-specifier has objective case by (61c). INFL is null in both (71a) and (71b) because the overt inflectional possessive morpheme *'s* is used only where the possessor is third person. Although we might expect to final a parallel change from objective to nominative subjects in clausal structures, we clearly cannot test this empirically in any straightforward fashion, because the pronoun you serves a common nominative/objective function.

The only other pronominal possessors used by Nicolas are the third person masculine singular forms him/his, which first appear in the transcripts at age 3;6. 10/13 (77%) of the relevant structures have an objective him possessor, the remaining 3 (23%) having a genitive his possessor. An exhaustive list of the relevant structures is given in (72) below:

(72) (a) It's him house. It's him hat (x2). Him eye is broken. Him bike is broken.
I want to go in him house. Help him legs. What's him name (x3)
(b) What's his name (x3)

In terms of the analysis presented here, nominals such as his name/him name would have the respective (simplified) structures (21a/b) below:

(73) (a) $[_{IP}$ his $[_{I}$ +agr ø] name]

(b) $[_{IP}$ him $[_{I}$ -age ø] name]

We find a genitive his possessor by (61b) in (73a) where INFL is fully specified for possessor-agreement, and an objective him possessor by (61c) in (73b) where INFL is underspecified for agreement.

An obvious question to ask is whether we find parallels between third person singular masculine possessors and third person singular masculine subjects. Typical copular clauses with third person singular subjects produced by Nicolas at 3;6 are illustrated below:

(74) (a) Here's him. Where's him? Him is alright. Him is my friend.
Him is a big woof-woof. Him is hiding. What's him doing?
Where's him going? Where's him? Where is him?
(b) What him doing? Him blue. Him alright. Him dead. Him my friend.
Him not my friend.
(c) He's happy. He's bad. He is a bad boy. He's in there.
(d) He happy. He a elephant.

25/32 (78%) of the copular sentences within third person singular subjects produced by Nicolas at 3;6 have objective him subjects (a figure comparable to his 77% use of him possessors), with the remaining 7/32 (22%) having nominative he subjects (compared to 23% use of his possessors). This is clearly consistent with our view that possessors and

subjects show a related pattern of development.

We can summarise the range of possessive structures used by Nicolas in the following terms. We find the same overall pattern of development with all three types of pronominal possessor which he uses: in each case, the earliest possessive nominals he produced have objective (me/you/him) possessors, and these are gradually ousted by genitive (my/your/his) possessors. Under the analysis suggested here, the transition from objective to genitive possessors reflects the transition from an early nominal structure with an inflectional head underspecified for possessor-agreement to a later nominal structure with an inflectional head fully specified for agreement. If (following Kayne) we take possessive 's to be a possessor-agreement inflection, there are obvious parallels here with the development of s-possessives: as we saw in (1-2) above, the earliest nominal possessor structures produced by Nicolas are s-less forms like Daddy car, and these are clearly consistent with the view that children's early possessive nominals contain an IP with an inflectional head which is underspecified for possessor-agreement.

Moreover, there are interesting potential parallels between the development of possessor+noun structures and subject+verb structures. Just as Nicolas fails to mark possessor agreement at all in nominal structures like Baby bottle until age 3;2 (and thereafter goes through a period of optional marking possessor-agreement), so too he similarly fails to mark subject-agreement in clausal structures like Baby have bottle until 3;2 (and thereafter goes through a period of optionally marking subject-agreement). Similarly, just as we find a transition from nominal structures with objective possessors (like me car, you car, him car) to structures with genitive possessors (like my car, your car, his car), so too we find a parallel transition from clausal structures with objective subjects (like Him naughty) to structures with nominative subjects (like *He's naughty*). If we assume that genitive and nominative case are checked via an agreement relation with a nominal and verbal inflectional head respectively whereas objective case is a default form used in agreementless structures, the gradual change from objective possessors and objective subjects to genitive possessors and nominative subjects reflects a parallel change from a structure headed by an agreementless INFL to one fully specified for subject-/possessor-agreement.

What all of this might suggest is a three-stage model in the acquisition of the morphosyntax of agreement. In the initial stage, agreement is not marked: consequently, subjects and possessors carry default objective case, and there is no use of possessive *'s* or third person singular +s. In the second stage, agreement is optionally marked: subjects carry nominative case and verbs carry third person singular s if agreement is marked, but subjects carry default objective case and verbs don't carry third person singular s if agreement is not marked; likewise, possessors carry genitive case and the possessive inflection *'s* is used if possessor-agreement is marked, but possessors have default objective case and no *'s* is used if agreement is not marked. In the third stage, children attain adult-like competence, and mark agreement in obligatory contexts, resulting in the correct use of genitive possessors, nominative subjects, possessive *'s* and third person singular +s in obligatory contexts.

Not surprising, the seemingly clear picture painted above is obfuscated by lexical factors (i.e. by the fact that different lexical items are acquired at different stages). For example, genitive my appears in the earliest transcripts, your first appears at 3;2, and his at 3;6; likewise possessive *'s* and third person singular s both appear at 3;2 (though the irregular first person singular forms am/ 'm appear at 2;8). The obvious consequence of this is that during stage 2 (i.e. the optional agreement stage), children's grammars license both agreement-specified and agreement-underspecified structures, but the relevant structures can only be produced if the child has the lexical resources to realise them. So, for example, at age 3;0 Nicolas is at the optional agreement stage and so would be expected to alternate between possessive nominals like my car/me car, and Daddy's car/Daddy car: but because he has acquired both me and my (but not possessive *'s*) at this stage, the actual range of possessive structures he produces is my car/me car/Daddy car. A further complicating factor is that when a new pronoun form is acquired, it can take several months before it is used productively. It seems likely that newly acquired items are initially difficult to access (becoming easier as time goes by), and this is why we find the observed pattern of a gradual increase in the frequency of their use.

Interestingly, the analysis presented here is consistent with the findings from a study by Ramos and Roeper (1995) of an SLI child (JC) between ages 4;4 and 4;6. JC alternates between objective and genitive possessors (e.g. 56% of his first person singular possessors are objective me and 44% genitive my), but has 0% use of possessive *'s* and third person singular s in obligatory contexts. In other words, JC would appear to be at the same stage which Nicolas reached at 2;9. In order to demonstrate that the use of me possessors is a competence error (reflecting a grammatical deficit—more specifically, an agreement deficit) rather than a performance error (resulting from e.g. retrieval failure in the sense of Rispoli 1994, 1995, 1997), Ramos and Roeper conducted a comprehension experiment on JC in which he was asked to match sentences with pictures denoting possession or action. They noted that in response to the following test sentences:

(75) The girl saw me paint/dress/bat/ski

in 4 out of 5 cases JC pointed to pictures denoting possession, suggesting that his grammar systematically licensed objective possessors.

The overall conclusion which the findings reported in this paper lead to is the following. There is an interesting symmetry between the development of subject+verb structures on the one hand and possessor+noun structures on the other. Nicolas seems to pass through an initial no inflection stage during which subject-agreement and possessor-agreement are not marked (a stage characterised by the use of objective possessors/subjects and the omission of possessive *'s* and third person singular s). At around the age 2;6 he seems to enter an optional inflection stage at which he alternates between agreement-specified forms like my car and I'm sick and agreementless forms like me car and Me wet: however, the fact that different lexical items are acquired at different ages means that some agreement-specified forms (like *Daddy's car* and It works) appear later than others. This optional inflectional stage lasts until the end of the transcripts at 3;6 (though by then agreement forms are generally well established and strongly preferred where lexical

resources permit and where an item is well enough established not to cause retrieval problems). The overall conclusion we reach is that the optional infinitives stage which two-and three-year-old children go through should more properly be thought of as an **optional inflection** stage during which both nominal and verbal inflectional heads may be underspecified in respect of the features they encode (the partial features which we have been concerned with here being agreement features).

5. Recent evidence taken from ERP-related Studies

In prep…

Full References

In preparation

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