

## INTRODUCTION

This dissertation involves a comparative analysis of the acquisition of nominal and verbal morphosyntax in child learners of Estonian, Hungarian, and English. The starting assumption, in its simplest form, is that the *feature* is a fundamental linguistic primitive and the acquisition of language entails the acquisition of features (Travis, 2008). Although the acquisition of words, sounds, and meanings all involve features and are all crucial elements of understanding language learning, this dissertation focuses on morphosyntactic elements shared between the Determiner Phrase (DP) and the Complementizer Phrase (CP). Following the hypothesis that these projections have deep similarities (Abney, 1987), studying grammatical elements shared between the nominal and clausal domains serves to explore the features' independence from the particular lexical items they appear with. In particular, special attention will be paid to the acquisition of case-assignment, agreement and person/number representation, and subjects/possessors. Additionally, this comparison allows an examination of syntactic development through the analysis of the increasingly complex CPs and DPs.

This project has three goals. The first is to examine how and to what extent the theoretical parallels between the DP and the CP are reflected in the acquisition of these syntactic categories and the features they are composed of. The second goal is to better understand the role of features in acquisition. Formal approaches to language acquisition have long focused on the development of the functional aspects of language; this study aims to discuss the development of these functional aspects in

terms of their component features rather than assuming a pre-existing set of functional categories. Finally, the comparison of three different languages in these terms will allow for conclusions to be drawn regarding how particular morphosyntactic differences between languages are reflected in the acquisition process.

The morphosyntactic descriptions of the language will show how, despite a great deal of morphological variation, the underlying syntactic operations are quite similar. The analyses of each individual language's children will show quite similar syntactic and morphological development. Though there are some significant time scale differences between children, the overall path looks the same within a language. The comparative study, on the other hand, indicates that while syntax develops similarly both cross-linguistically and in the CP and DP, morphological development is strongly affected by the details of the particular language and projection. These differences will be used to evaluate various formal approaches to acquisition and explore limiting factors in linguistic development.

Estonian, Hungarian, and English were chosen for a variety of reasons, both theoretical and practical. For the relevant aspects of CP/DP morphosyntax the languages have enough in common to be comparable, but enough differences exist between them that meaningful conclusions might be drawn from that comparison. Specifically, all three have morphological agreement, similar person/number paradigms, and morphological case, though the agreement facts range from rather simple in English to quite complicated in Estonian and the case systems vary greatly in their details. Additionally, Estonian and Hungarian are relatively understudied languages, making their study an important contribution to the body of acquisition work, yet they are not so obscure that there is not also a body of theoretical work to rely on in the analysis. Though many languages fit this description, these three have the final benefit of being well-represented in the CHILDES (MacWhinney, 2000) corpora, allowing a thorough

examination of acquisition for all three during the crucial period of morphosyntactic development.

This dissertation is organized as follows: Chapter (1) outlines the theoretical frameworks, summarizes a variety of formal approaches to language acquisition, and describes the motivating DP-CP parallels. The subsequent three chapters discuss the details of DP and CP morphosyntax and their acquisition in Estonian (Chapter (??)), Hungarian (Chapter (??)), and English (Chapter (??)), respectively. The fifth and final chapter compares and contrasts the language-specific results and their significance to language acquisition.

## CHAPTER 1

### LINGUISTIC THEORY & APPROACHES TO ACQUISITION

This chapter provides an overview of the theoretical models guiding the project. The first section describes the morphological and syntactic frameworks to be used in analyzing the target languages of Estonian, Hungarian, and English. The second section describes the many parallels in structure and function between the DP and CP, making the case for using the various similarities between the two as the focus for this study of longitudinal child language data. The final section reviews relevant first language acquisition studies and describes the methodology to be used in the following chapters.

#### 1.1 MINIMALISM & DISTRIBUTED MORPHOLOGY

This section will overview the theoretical syntactic and morphological frameworks to be used to carry out the subsequent analysis. A minimalist syntactic model, following Chomsky (1999) and subsequent work, will be assumed here. Most important to the analysis is the nature of agreement, described as a relationship between a *probe* and a *goal* (Chomsky, 1999):

- (1) a. An unvalued feature F (a *probe*) on a head H scans its c-command domain for another instance of F (a *goal*) with which to agree.
- b. If the goal has a value, its value is assigned as the value of the probe

This model is assumed to capture the syntactic nature of agreement, though the morphological aspect of agreement may take different forms, to be discussed below. Case-assignment is assumed to be a result of the Agree relation, with nominative case assigned by a (finite) T head (Chomsky, 1998). The clausal analogy, to be discussed in greater detail in section 1.2, has led to many interesting insights regarding the structure of nominals. It suggests that the CP and DP have similar functional structure and properties. The corresponding case and agreement operation within the DP is the relationship between possessors and a functional head somewhere within the DP. This functional head will agree with the relevant  $\phi$ -features of the possessor. If there is an EPP feature associated with that functional head, the agreed-with item may raise to the specifier position of that head (Chomsky, 1982). A generic example of agreement is represented in Figure (1.1).

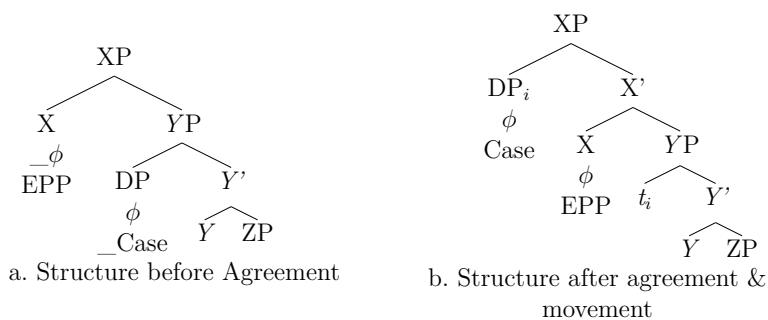


Figure 1.1: Agreement Schema

In this model,  $X$  is the *probe*, having unvalued  $\phi$  features, and will seek values for these features on an active *goal* in its c-command domain Chomsky (1999)<sup>1</sup>. The resulting operation leads to the features being valued on the probe, and the goal DP is then assigned case, becoming inactive for future agreement operations. If the probe

<sup>1</sup>Probes are often assumed to consist of  $\phi$ -feature bundles— a single probe that seeks out person, number, or gender features, though recent research, seeking to explain discrepancies between number and person agreement, has begun to suggest particular features may be probed for independently (Preminger, 2011; Adger and Harbour, 2007). This line of thought has been pursued for various reasons, though differences in the acquisition of certain types of  $\phi$ -agreement may provide additional evidence for the separation of probes.

has an EPP feature, this causes the goal to move to a specifier position above the probe.

Additionally important for the analysis is the nature of the *phase*. The phase is important for both syntactic and morphological reasons, serving as the primary unit within which cyclic spell-out occurs. Chomsky (1998) introduced the phase as a syntactic domain crucial for understanding restrictions on movement, with the important phases for the syntax being *v*P and CP. Only elements in the head and specifiers of a phase are visible to higher elements for agreement and movement purposes. In Figure (1.1)a, only the DP in the specifier of YP or Y, if it has the relevant features, are available for agreement with X. Assuming YP is a phase, elements lower in the structure, such as ZP, are not accessible to agreement.

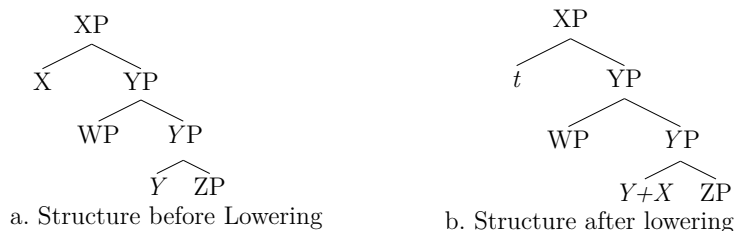
The phase is important to the analysis of possession, as it will determine what DPs are available for agreement and case assignment within the nominal. Phasehood and cyclicity are also important for understanding the nature of allomorphy and the process of vocabulary insertion (Embick, 2010). The spell-out of a phase head and its complements does not occur until the merging of a higher phase head. This means that phase heads delimit the boundary for affecting allomorphy: only elements within the same spell-out domain may affect the phonological form of the word.

The nature of word formation and morphology will be analyzed in the Distributed Morphology (DM) framework, following Halle and Marantz (1993); Embick (1997) and much subsequent work. Though many scholars may differ in the details of their applications, DM approaches have several important characteristics. A distinct generative lexicon is not assumed in DM; the syntax operates not on words but instead on abstract bundles of morphosyntactic features. After the syntactic operations are carried out on these feature bundles, a structure is subject to another set of morphological operations, described below. After all morphological operations have occurred,

the terminal nodes receive their phonological expression in a step called *vocabulary insertion*. *Late insertion*, which refers to the fact that morphosyntactic structures lack phonology until this final step, is an important element of the DM framework as it maintains a strict division between the abstract features important for syntax and the phonological features ultimately pronounced. Vocabulary insertion is subject to *underspecification*– phonological forms may expone only a subset of features that are represented syntactically at a given node.

There are several operations specific to the morphological component that manipulate nodes of a syntactic structure. These operations are crucial in situations in which the morphology does not appear to map 1:1 with the syntax, as is the case with Hungarian possession (see Section (??)). The following definitions are adapted from Harley and Noyer (1999) and Embick and Noyer (2001):

- (2) a. *Lowering*: adjunction of one head to another, lower head



- b. *Local Dislocation*: an element trades its relation of adjacency to a following constituent with a relation of affixation to the linear head of that constituent.

$$[X [ [ Y ] ZP ] ] \rightarrow [ [ Y + X ] [ ZP ] ]$$

- c. *Impoverishment*: the deletion of morphosyntactic features from functional heads in certain contexts

$$Z\{a, b, c\} \rightarrow Z\{a, c\} / X \_ Y$$

- d. *Fission*: the splitting of features on a terminal node into another node, allowing the exponence of multiple Vocabulary Items

$$\{a,b,c,d\} \rightarrow \{a,b\} + \{c,d\}$$

Following the assumptions about agreement discussed above, features on heads drive the syntactic agreement and case-assigning process, though these features do not project their own terminal nodes in the syntax. Chomsky (1995) makes the case for a syntax without distinct AGR nodes, noting that, being compositionally meaningless, they should have no role there. Morphological agreement and case marking are handled in various ways in the DM literature (Embick, 1997, 2010; Arregi and Nevins, 2012). Here, I will follow Embick (1997) in assuming that morphological realizations of both case and agreement are *dissociated* morphemes— inserted after the syntactic operations Merge and Move but before vocabulary insertion, with relevant features copied from the nearest relevant head. In this way, they are not represented in the syntactic derivation that is interpreted by the semantic component and exist solely post-syntactically. The details of the morphological realization of these features will be discussed in greater detail in the discussion of the particular languages' realizations.

Finally, an account of *concord*, which may or may not be formally identical to *agreement*, is important for understanding the mechanisms at work inside the DPs in the target languages. While verbal agreement is co-occurrence of features between items in different extended projections (such as person features of a DP occurring on a verb), concord refers to the co-occurrence of features on items within an extended projection— such as between nouns and their determiners, demonstratives, or adjectives. Though a description of both agreement and concord as feature co-occurrence



is accurate, it is a question whether the process that leads to the feature co-occurrence is the same in both cases.

Several different approaches to concord have been suggested in the literature. Baker (2008b) suggests that agreement and concord really are instantiations of the same process, and the differences between the two are based on the direction a head probes for features, with different languages having different possible specifications. Brattico (2011) takes the same point of view, arguing from Finnish and Russian data that case concord is simply case assignment occurring multiple times across all items that require case. Other approaches, starting with Chomsky (1981), suggest a distinction between concord and agreement involving feature percolation. Babby (1987), for example, suggests that case is assigned to a maximal projection ( $N^{max}$  in his terms) and that a distinct case-percolation mechanism then copies the case to relevant heads within the nominal. More recently, Norris (2014) proposes that concord happens post-syntactically, with Agr nodes copying the relevant features from the closest element with those features, also via percolation.

For the current acquisition study, a distinction is drawn between concord and agreement. Though a particular mechanism for how concord occurs is not strictly required, a future study that focused on differences between the acquisition of verbal agreement and nominal concord would shed light on whether they were developmentally related. The formal descriptions of the target languages will use concord as evidence for the internal structure of nominals, though any of the approaches above can capture the range of facts important for present purposes.

## 1.2 THE CLAUSAL ANALOGY

The similarities between clauses and nominals have been discussed in generative linguistics for years. Chomsky (1970) focused on verbal nominalizations, noting that subjects in simple transitives become genitives in the related nominalization, as in (3).

- (3) a. The army destroyed the bridge  
       b. The army's destruction of the bridge

Examples like these not only suggest a relationship between agents and possessors, but also point to the fact that the argument structure of a verb seems to be inherited in related nominalizations. This is clearest in gerunds or nominals with very clear derivational relationship to verbs like in (3b), though still apparently true for a variety of nouns.

Abney (1987), followed by Szabolcsi (1994) and many others, showed that the DP represented a level of functional structure above the NP rather than being simply an adjoined projection in the specifier of a dominating NP. In this sense, the DP and PossP are parts of the extended projection of the noun in the way that IP and CP are parts of the extended projection of the verb (Grimshaw, 2005).

As verbal argument structure allows thematic objects to be raised to subject in passives, the functional structure of nominals also allows objects of nouns to be syntactically moved to the possessor position. This suggests that the intermediate projection in the DP, call it Poss, is very similar to T. Typically, the T will agree with and assign case to the agent in Spec-*v*P, though it agrees with a lower noun in a passive. Likewise, if there is no possessor, Poss is free to agree with and assign case to an agent or a theme argument if they exist, such as in a verbal nominalization.

Morphological possessors— that is, any genitive-case bearing nominal in English, have a wide variety of thematic relations to their possessa. Examples in (4) show several possibilities.

- (4) a. Picasso’s painting (Picasso=Agent)  
 b. The cake’s baking (Cake=Theme)  
 c. The student’s books (Student=Possessor)

This additional parallel is consistent with Baker (1997)’s Uniformity of Theta Assignment Hypothesis (UTAH), which requires that the same theta roles are assigned to DPs in the same location. Agent, theme, and actual semantic possessors must all receive their thematic role in different base positions, entailing that their ultimate realization in the position of the morphological possessor is a result of movement. Following Adger (2003) and merging all semantic possessors at *Spec<sub>n</sub>* would allow them to move into the *SpecPoss* position ahead of any arguments<sup>2</sup>. If non-argument possessors are assigned a Possessor thematic role, merging them all in the same position would satisfy UTAH.

Another unrelated parallel was first brought to attention by Szabolcsi (1983), who capitalized on the possessor agreement in Hungarian. As will be discussed in much greater detail in Chapter (??), Hungarian possessa agree with their possessors, and these agreement morphemes are nearly identical to those seen in the verbal paradigms. This led Szabolcsi to propose an INFL projection within the noun phrase just as in

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<sup>2</sup>Merging at *SpecNumP*, following Ritter (1991) would satisfy the same requirements as merge in *Spec<sub>n</sub>P*, though may require a more complicated morphological analysis for a language like Hungarian, where possessive morphology comes between the root and the plural morphology. Ultimately, either option is workable.

the clause. The examples in (5) show the second person singular agreement morpheme both in a full sentence and in a possessed noun<sup>3</sup>:

- (5) a. a te kalap-**od**  
 the 2SG.NOM hat-POSS.2SG  
*your hat*
- b. te rúg-**od** a fiú-t  
 you.NOM hit-2SG the boy-ACC  
*you hit the boy*

Clauses and nominals both may have ‘subjects’ with particular case-marking and argument structure; they both may contain inflection/agreement; they both consist of a lexical core dominated by functional projections. The trees in (1.2) show these broad similarities. Together, these ideas form the basis of the suggested parallelism between DPs and CPs.

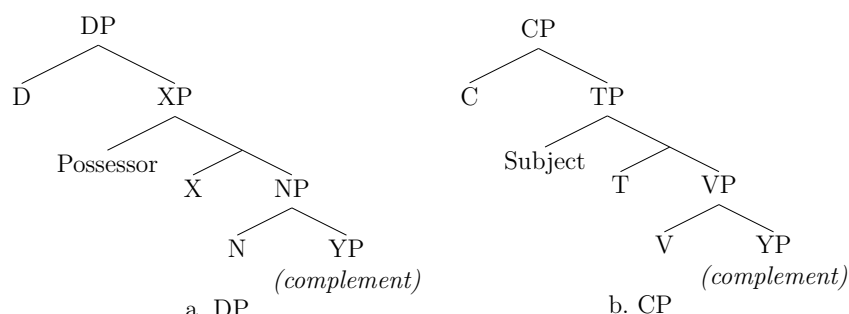


Figure 1.2: Basic Parallel Structure for DP,CP

These simplified trees show the basic parallelism between the two, though in both cases more functional structure may exist, e.g. aspect or mood for verbs and number for nouns. Additionally, the state of the XP in the DP tree is unclear, but will be

<sup>3</sup>Hungarian verbal agreement has two paradigms; the possessive agreement paradigm shares morphemes with each paradigm (See Section (??).)

discussed in detail for each language in their respective chapters. For simplicity's sake, this will generally be referred to as Poss (for possessor), though it does not necessarily host semantic possessors.

Beyond the syntactic and morphological similarities between the two, there are also more semantically-oriented aspects. Alexiadou et al. (2007) points out that CPs and DPs may both be arguments of verbs. Additionally, the pragmatic and context-sensitive aspects are encoded at C and D: determiners link nouns to their real-world entities as complementizers relate propositions to truth-values and speech-acts.

There are also counter-arguments to the parallels, especially with regards to the correct way to frame the parallel. Horrocks and Stavrou (1987) suggest that the DP is actually more rightly considered a parallel to the TP in many languages, with differences dependent on whether there is a prenominal "subject" position in DPs, with languages like Greek lacking this position, making Greek DPs more akin to TPs. Other conceptions of the maximally maximal projection, so to speak, of nominals is not DP but K(ase)P (e.g. (Lamontagne and Travis, 1987; Bittner and Hale, 1996)). Bruening (2009), on the other hand, suggests that the DP as CP parallel is wrong and that N shares much more with C than with D. Despite these arguments, the study will proceed, with the discussion of each language's facts lending more support to the comparison, though alternate analyses will be evaluated in Section ??.

### 1.3 FIRST LANGUAGE ACQUISITION

With the discussion of the morphosyntactic model complete, the discussion will now move to questions particularly concerning the problem of acquisition. First, work that explicitly addresses Minimalism/DM in acquisition will be addressed, exploring the benefits of using this approach and understanding the type of predictions that can be

made. The next section reviews a variety of approaches to first language acquisition, with an emphasis on understanding the initial and subsequent states of child language. The final part of this section reviews studies related particularly to the acquisition of possession and related morphology.

### 1.3.1 PARAMETERS, MINIMALISM, & DM IN ACQUISITION

The particular way one approaches the study of acquisition determines how specifics of syntax and morphology may inform the theory. Generative approaches to acquisition have been rooted in the Principles and Parameters model of language (Chomsky and Lasnik, 1993), which holds that language can be described in terms of language invariant *principles* (such as subjacency) and language-specific *parameters* (such as the Head-Final parameter). A principles and parameters-based approach constrains the hypothesis space for a learner, significantly reducing the options that must be considered. Linguistic principles are built-in, but the parameters must be learned or ‘set’ by the child through the acquisition process. Adopting this sort of model requires a solid conception of how parameters are best understood. Baker (2008a) draws a distinction between *macroparameters* and *microparameters*— the former characterizing large statements about what a particular language is like, such as being V2 or *pro*-drop. Approaches consistent with this view include Hyams and Wexler (1993) and Legate and Yang (2007); a child acquiring language is evaluating their input to find evidence for particular (macro-)parametric settings. Microparameters, in contrast, concern a much more fine-grained analysis of the ways languages may vary, and the joint functioning of a large number of microparameters together lead to large variation (Kayne, 2005). Whereas a macroparameter might be of use for a child to determine whether their language is *pro*-drop, a microparameter would be used in identifying, in one of Kayne’s examples, the position of clitics relative to

infinitives. The former has obvious, wide-ranging effects on a language, though the latter is still important and must be learned differently by speakers of otherwise very similar language. Though Baker (2008a:360) concedes that any macroparameter may be recast in terms of several microparameters, he maintains that both are helpful in understanding language variation and acquisition.

Boeckx (2011) describes the macro- and micro-parameter as a distinction between approaching parameters from above versus from below. The first set of approaches question the nature of varying *parameters* from above— assuming the hypothesized parameters and studying how the child comes to set them. The second may be seen as studying parameters from below— begin with the an analysis of lexical items and the parameters emerge. Boeckx (2011:5), in fact, notes that current models of syntax, which assume a uniform syntax and variation only in the lexicon<sup>4</sup>, actually leave little room for the type of from-above view of parameters, which raises questions about how they could be involved in the acquisition process.

Yet another perspective on parameters is provided by Biberauer et al. (2013), who add mesoparameters and nanoparameters to the parameter ontology. They understand parameters to be statements about how lexical items, which in their terms includes both lexical and functional items as understood here, behave. If all items in a particular class share a certain feature or behavior, they are macroparameters; an example of this would be languages that consistently linearize head-first. A nanoparameter, on the other hand, would apply only to a very limited subset of items; the example they use is the English degree modifier *enough* which, unlike other degree modifiers, follows rather than precedes its adjective. Parameters for them are not

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<sup>4</sup>Lexicon is meant here somewhat atheoretically. In DM terms, there is not a lexicon but an Encyclopedia/Vocabulary. In a DM model, the features/feature bundles associated with vocabulary items would be where variation must exist, in addition to the presyntactic lexicon of feature bundles selected and manipulated by the syntax.

like switches that the children flip but epiphenominal descriptions of the behavior of classes of items. When acquiring the language, children learn facts about particular lexical items and then generalize them until additional facts cause them to adjust their hypothesis.

These various approaches to understanding parameters rely to a large extent on how rich UG is. If a child starts off able evaluate possibilities such as "Is my language pro-drop?" then macroparameters would be very helpful in quickly coming to conclusions about how to organize their particular grammar. On the other hand, a more minimal UG equipped with just a few operations would not be able to take advantage of such a system. In this case, the microparametric view seems to be more in sync with the tools a child has. Biberauer et al.'s description of parameters both takes advantage of a macroparametric view's ability to describe wide classes of languages while also requiring a minimal evaluation system to get to this point.

A feature-acquisition point of view is consistent with what Baker (2008a) calls the Chomsky-Borer Conjecture— that variation is limited to features on functional heads, and that variation is the ultimate result of acquiring a (perhaps subtly) different set of features and feature-bundles. The development of functional categories and the features associated with them is a good place to examine variation. This feature-based approach is also appropriate for the comparative analysis of DPs and CPs proposed here— if *features* are what is being acquired, then evidence for those features could (and perhaps should) appear independently of the functional category or perhaps lexical item in which they are bundled in the adult grammar (Hegarty, 2005).

This type of feature-based acquisition motivates the approach of this project. For example, 2SG agreement on a verb is evidence for the acquisition of *those* features, not necessarily evidence for an adult-like syntactic head T— a bundle consisting of a AGR, Tense, and NOM case assignment. If features are independent of the bun-



dles they frequently appear with, the 2SG feature's presence in the verbal agreement environment suggests that the 2SG feature exists in the grammar and will also be available for use on a pronominal D bundle. In this way, there will be a closer relationship between when a child acquires a pronoun and a corresponding agreement morpheme than there is between one agreement morpheme and another. Alternatively, if the child is not acquiring *features* but the functional heads, it is expected there will be a stronger relationship between when pronouns are acquired as a group and when agreement is acquired as a group. The relationship between acquiring features and functional categories is crucial, as a wide range of studies focus on the development of functional categories (Lust et al., 1994; Verrips and Weissenborn, 1992; Clahsen et al., 1993; Radford, 1996; Vainikka, 1993; Poeppel and Wexler, 1993; Félix-Brasdefer, 2006) These types of approaches will be discussed in depth in the following section.

Many of the acquisition studies cited above are framed in a Government & Binding approach to syntax and morphology and will have to be addressed with the understanding that they rely on similar but ultimately different assumptions about the way the grammar is organized and operates. The research described in these chapters, in contrast, are grounded in the Minimalist approach, and so a brief discussion of specifically Minimalist research into acquisition is warranted. Yang and Roeper (2011) argue for some specifically Minimalist technology in modeling child language acquisition. In particular, the Labelling Algorithm discussed in Chomsky (2006) requires that when merging two items, only one be used as the label. Assuming asymmetric merge is an element in early child language, according to Yang and Roeper (2011), suggests an ability to distinguish between child language pairs such as *ocean blue*, a small clause without a copula, and *blue ocean*, a nominal with an adjective. Additionally, assuming that this type of Merge is basic to human language offers a stepping off

point for the acquisition problem. If knowledge of Merge is a basic part of a Universal Grammar/ Language Faculty, it follows that acquisition will be, in some sense, learning to "un-merge," that is, to parse. Utterances must be decomposed into the words and features they comprise, and early acquisition will consist of the first items (features, roots/"words") first identified by a child.

The importance of and relationships between formal features and agreement in acquisition has also received attention. Roeper (1998) suggests that early child grammars are best described by children acquiring abstract formal features first rather than functional categories. He suggests that if children inherently make a distinction between closed-class functional features/categories and open-class lexical features/categories ( e.g. semantically-meaningful features), it will both restrict the positing of functional elements and allow the easy additional of new lexical items. Radford (2000) examines data from CHILDES and shows that children gradually build the feature-bundles associated with functional heads feature-by-feature. This includes the development of both nominal items like gender and number on pronouns, as well as verbal elements like tense and aspect. Corr ea (2009) shows how  $\phi$ -features of Brazilian Portuguese nominals would help a child to posit functional features/heads and begin to fill out the details of the grammar. Experimental results show that infants were sensitive to the inclusion of determiners in the language before they were producing them (around 15 months). Slightly older groups of children were tested and shown to be sensitive to both gender and number agreement. Taken together, Corr ea says these results show that children are sensitive to these functional features at an early age and that this sensitivity allows them to quickly begin parsing DPs and learning the correct set of features in the language.

Less work has been done on acquisition in terms of distributed morphology, though there are some studies that suggest how it might be approached. Barner and Bale

(2002) show how a model with lexical underspecification is consistent with a variety of psycholinguistic research and argues that underspecification simplifies the acquisition process. For evidence of this, they point to the tendency of children to freely insert roots in noun or verb positions generally unacceptable to adult speakers, such as using *broom* as a verb in lieu of *sweep*, or *gun* as a verb instead of *shoot*, despite not hearing this in the input (Barner and Bale, 2002:777). While children eventually must learn the target forms, the fact that they initially use non-target-like items points to underspecified, acategorical forms in their grammar. They also show that a lexicalist approach that required separate entries for different uses of a word would be more computationally difficult than a comparable root-based system.

Rather than having to learn a variety of derivational processes to turn verbs into nouns, a child may combine roots with category-defining heads. There are not distinct morphological and syntactic derivations that need to be learned— one system is responsible for both. Children do not need to learn first nouns and verbs and then learn another process to turn one into the other. There is just one syntax with category-defining heads that may take roots as complements in the simplest example, or take more complex complements which ultimately result in more complex words.

Though not couched in explicitly Minimalist/DM terms, Harley and Ritter (2002)'s feature hierarchy approach makes predictions regarding person and number acquisition that are potentially relevant for the current proposal. The hierarchy describes dependencies between different features, with the availability of particular features dependent on the acquisition of features/nodes closer to the base. Figure (1.3) shows the hierarchy for pronouns as Harley and Ritter envision it. Rather than pruning features from a universal set, a child will begin discovering features, building the hierarchy and the relevant features from the root out.

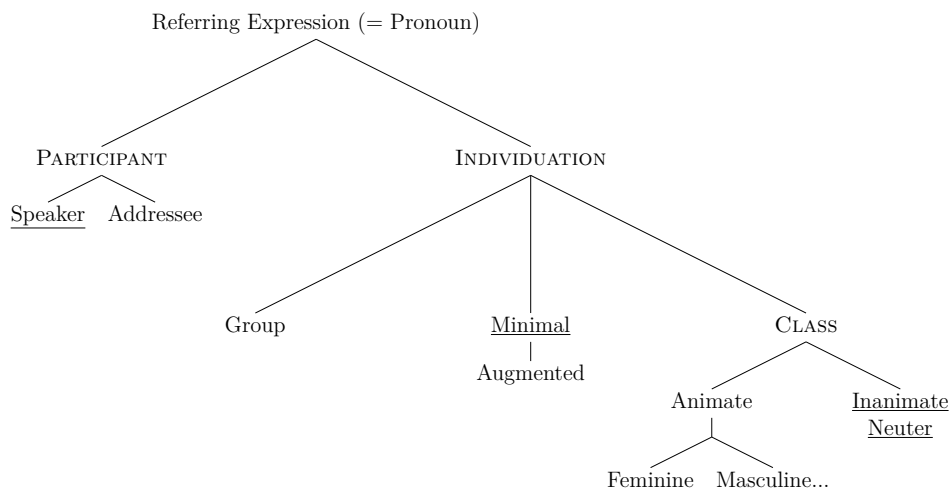


Figure 1.3: Harley and Ritter (2002) Feature Hierarchy

Though the child is exposed to the entire range of pronouns, the acquisition process is predicted to be constrained as the child begins making distinctions, gradually filling out the tree. This allows for variability in acquisition— a child may discover one branch of the hierarchy before another, e.g. by beginning to make distinctions on the Participant branch before making distinctions on the Individuation branch, or vice versa. The hierarchy also constrains acquisition— a child must acquire nodes closer to the root before more deeply embedded ones.

Not only is this a theoretical advantage, but there is evidence for this in a range of acquisition studies Harley and Ritter cite (Schieffelin (1985); Clark (1985); Feuer (1980), among others). The hierarchy predicts that higher nodes are acquired before lower nodes and default (underlined) values before others, but makes no predictions regarding left or right. As such, singular (Minimal) will be acquired before plural (Group), and first (Speaker) before second person (Addressee). The child might begin developing the Participant node, in which case they would discover first person before

second. They might also begin developing the Individuation node, in which case third person singular would come first. No predictions are made with respect to first person (Speaker), which does not involve the individuation node, and third (Minimal), which does not involve the Participant node. Variability of acquisition order does exist between third and first person, which is expected as these features are on distinct branches of the hierarchy.

With respect to the current proposal, the effects of a such a hierarchy may be examined on the acquisition of the *uninterpretable* features present on the verb/possessum as well as interpretable features of the possessor/subject. Though Harley and Ritter do not address agreement, noting both the difference between pronouns and agreement as well as the difficulty to sometimes distinguish them, Béjar (2003) examines  $\phi$ -features in both pronouns and agreement and develops a largely similar hierarchy for understanding relationships between feature sets. If person features, in both their interpretable and uninterpretable versions, are acquired at once, this will support their underlying sameness, while differences in acquisition will suggest more independence between the features. This question will be addressed thoroughly in the chapters to come.

Harley and Ritter do not directly address case, which they consider a syntactic problem, though they acknowledge that in principle a case hierarchy might also play a role in acquisition. Case hierarchies have been referred to for other reasons, such as characterizing typological generalizations or explaining agreement alternations (Bobaljik, 2008; Moravcsik, 1978), though a case-hierarchy organized in a manner helpful for understanding acquisition would have to be independently motivated. Minimally, a case-hierarchy would have to distinguish between subject, object, and possessor cases (NOM, ACC, GEN, DAT), as well as the wide variety of locative cases used in Estonian and Hungarian.

The current section has discussed of a variety of theoretical approaches relevant to language acquisition, especially with respect to how individual features and morphosyntactic phenomena may be understood. The Minimalist/DM morphosyntactic model described will be used for the ultimate analysis, with an emphasis on features and functional heads as the locus of variation and as a target for acquisition. The next section will address a variety of ways to view the initial state of the child grammar and the manner in which it develops.

### 1.3.2 DEVELOPMENT OF THE GRAMMAR & FUNCTIONAL CATEGORIES

This section reviews three approaches to the development of functional categories in child language, each of which vary in their assumptions about the initial and subsequent state of the grammar. The first account, called the *Maturationist* view, holds that the language of an early learner is fundamentally different from an adult speaker—only after a certain period of time does something like a mature grammar "come on-line," after which the grammar is like an adult's. Another view, the *Strong Continuity* approach, holds that the grammar is essentially adult-like throughout and acquisition proceeds according to factors not dependent on any element suddenly becoming accessible to the child. Finally, several approaches take a split-the-difference approach, holding that the grammar changes over time—either in terms of the categories available or the nature of grammatical processes—but not in the drastic way suggested by Maturationist accounts. These views vary in their details, but can be described as *Weak Continuity*. Each of these three approaches to the nature of the developing grammar will be discussed in the next three sections.

### 1.3.2.1 MATURATIONAL ACCOUNTS

The maturational approach holds that the initial state of the grammar is qualitatively different from the adult grammar (Platzack, 1996; Ouhalla, 1991). Radford (1996) studies the production of children between 1;8 and 2;6 and is a prime example of this approach. Initial stages of multi-word utterances are not considered to be full sentences with an adult-like grammar, rather they are merely “lexical-thematic” projections— they lack the non-thematic, functional categories that characterize mature adult speech. Functional material such as agreement, tense, modals, determiners, and complementizers will all be absent during this stage in language development— only nouns, verbs, prepositions, and adjectives are accessed. In DM terms, this might be characterized as a syntax that consists only of roots or the category-defining heads *n*, *v*, and *a* and their associated roots. Prepositions, often considered to be functional items, are included in Radford’s lexical-thematic stage.

Before the functional structure (CP, IP/TP) is present after around two years, verbal argument structure— the knowledge that verbs take complements— must be acquired. Children make use of simple structures: a verb along with the NPs it theta-marks: complements and subjects. Verbal argument structure minimally entails the category-defining *v* head to accept a root, plus additional structure for Spec*v*P to have a subject in its specifier or host a complement .

Utterances with functional items optionally occurring along with their functionally-deficient, lexical-thematic counterpart utterances are produced during a transitional stage. This stage will be characterized by both correct and incorrect forms appearing at once, even in consecutive utterances such as “I’m pulling this. Me going make a castle”(Radford, 1996:499). Utterances like these are not what Radford characterizes as thematic/functional code-switching— once children enter the functional

stage, all sentences are underlyingly similar, though children may make use of non-target-like null allomorphs or have trouble generally spelling out the reflexes of agreement (Radford, 1996:507).

Case-assignment errors may also occur, though Radford notes that in his corpora, this only occurs for subjects, which appear in all three case forms. These errors do not indicate a lack of appropriate structure or a lack of case-assignment but simply the *wrong* case assignment. Radford writes that “the nature resides in the child not having mastered the complex conditions under which a particular kind of head licenses a particular kind of specifier” (Radford, 1996:503). This same type of error can be captured in the same spirit through underspecification or incorrect specification of vocabulary items allowing different case forms to be spelled-out. Which of these explanations best describes a particular child’s development depends on the sort of utterances they make. A child that seems to randomly choose a pronominal form may have several underspecified vocabulary items, while one who consistently produces a particular form may have incorrectly mapped features to form.

Within a maturational approach, development of the C-system also occurs at the same time the I-system is developing, reflecting the point at which all functional structure is said to “come on-line”. The DP being analogous to the CP, in the approach explored here, agreement in nominals should occur at the same time as agreement in sentences, correct genitive case and nominative case assignment should be acquired at the same time, and possessives, determiners, and complementizers should all be produced in the same time period. In terms of features, it could be framed as a stage where grammatical features begin to appear either on their own, in bundles with other functional items, or along with roots.

In his later work, Radford (2000) suggests the driver that pushes a child from a thematic to a functional grammar is the availability of uninterpretable features in



the grammar. Children, he hypothesizes, are perfect learners who assume a perfect linguistic system—one that does not include uninterpretable features or redundant information. As they are learning, they omit these items such as definite articles and agreement morphology. Eventually they learn that uninterpretable and redundant information does exist in their linguistic structures, prodding them to posit and produce items that they previously ignored. This description of the actual maturational process from the initial stage to the next is more in keeping with a minimalist approach to language acquisition, though it seeks to explain the same set of facts as initially described in the earlier article.

This hypothesis broadly accounts for the differences between child and adult speech, but closer examination of the details reveals problems. Functional items like complementizers and pronouns appear much earlier than Radford predicts, and they do not all appear at the same time. The maturational account does not have a clear way to deal with these complicating facts. Radford suggests that the actual utterances do not necessarily reflect the underlying structure during a transitional stage—for example apparent movement may just be base-generation in an adult-like movement target. This may well be the case, but it cuts against the strong predictions made by the model.

Considering the morphosyntactic elements crucial to the DP-CP comparison, a maturational account makes a variety of predictions. If agreement is considered as a distinct process that must be acquired somewhat independently or come on-line at a distinct time, there should be a point in a child's grammar after which agreement suddenly appears, both within nominals and within clauses, prior to which agreement will either not be realized or possibly realized with a default/null form. Another way to characterize this would be that the uninterpretable features that act as probes

in the adult grammar are not acquired until later and not until their interpretable counterparts are well in place.

Similarly, the uninterpretable case features could be acquired at a later point, resulting in an initial stage where unmarked/null or default case is used. Their acquisition would coincide with the additional functional structure required to host them. Similarly, the movement of a possessor to a higher position within a DP must follow the acquisition of a larger functional structure to serve as the target for movement. Evidence of this movement might be found in the relative position of possessors and pre-nominal modifiers or other functional material such as demonstratives and quantifiers.

If there is not a strong relationship between the acquisition of agreement and the different types of case-marking, or the various kinds of movement to each other, either the maturational hypothesis must be abandoned or there must be distinct phases of maturation suggested, though this latter hypothesis effectively makes the Maturational view a flavor of Weak-continuity.

### 1.3.2.2 STRONG CONTINUITY

The Strong Continuity approach is taken by some researchers to be the null hypothesis: without evidence to the contrary, the grammatical system of a developing child grammar is fundamentally the same as the adult system. Pinker summarized the view plainly in 1984: "In the absence of compelling evidence to the contrary, the child's grammatical rules should be drawn from the same basic rule types, and be composed of primitive symbols from the same class, as the grammatical rules attributed to adults in standard linguistic investigations"(Pinker, 1984:7). Pinker rejects a maturational account for reasons of parsimony: a maturational account must have two sets of

principles— one to guide the initial state and one to guide the developed state. He suggests children start with a set of universal semantic notions like *agent* or *patient*, and from these fill out the details of their language. In contrast, other Strong Continuity models (Poeppel and Wexler, 1993; Lust, 1994; Félix-Brasdefer, 2006) impute fine-grained syntactic knowledge to child grammar, which includes functional syntactic categories like CP and TP from the start. Prime evidence for Strong Continuity comes from the fact that a wide range of functional words *do* appear in early child grammar, though not yet in a systematic, adult-like way. These divergences require an explanation, though one that does not rely on positing a deficient grammar for the learner. Most Strong-Continuity studies, following the prevailing grammatical framework of the time, assume a grammar with pre-defined functional categories, which makes considering them from a feature-first point of view somewhat difficult.

Poeppel and Wexler (1993) is an oft-cited example of a Strong-Continuity approach. Studying a German-speaking child at 2;1, they found that at this early stage "the full complement of functional categories [was] available to the child"(Poeppel and Wexler, 1993:1). The focus of their study was primarily I- and C-related constructions, using word order as the primary evidence for various structural positions. The authors capitalized on German's V2 property, requiring I-to-C movement, and studied the various word-order alternations used. The only difference between child grammars and adult grammars for German that they found is that for children, infinitival verbs are permitted in final position in matrix clauses. This suggested to them that I (or T in current terms) was available but was deficient and did not have the same properties as the adult I. The eventual overcoming of a deficiency in I/T seems to actually admit a maturing rather than continuous grammar, though the key difference is the existence of the syntactic projection from the start.

To demonstrate that this is the only difference, Poeppel and Wexler show that non-finite verb forms systematically appear in verb-final position, while finite forms appear in second position. Children differ from adults in that their grammar allows matrix verbs to be non-finite, suggesting that an elaborate structure is responsible for determining how verbs are marked. Children make a finiteness distinction that, while different from adults, requires functional structure beyond that which is posited by a maturational account. This functional structure consists of at least an I-level structure, which is used with verb final, non-finite sentences, and a C structure, which provides a place for V2, finite verbs.

Verbal agreement was also shown to be acquired mostly successfully, with errors limited to plural subjects, suggesting it is not Agreement *per se* that is lacking but that the rules are not fully developed or the forms are underspecified. Poeppel and Wexler do not make claims about why this should be the case, though distinct person and number probes could play a role in this analysis. One caveat they note, however, is that in natural adult German speech, first person agreement is often reduced, allowing null first-person singular agreement to be reasonably posited by the child, making it unclear whether agreement is present in child data.

The particulars of each language's agreement patterns will affect the predictions Poeppel and Wexler would make. Hungarian's third person singular will present the same analytical problem regarding bare verbs versus null allomorphs. Distinguishing between bare verbs and null allomorphs is also a problem for English, where agreement is only overt on auxiliaries and non-past 3SG. Estonian, on the other hand, has no null person and number verbal agreement and bare verbs only appear as imperatives, so there will be little question regarding correct morphological analysis. Once there is sufficient evidence that the vocabulary items associated with agreement are acquired, a morphological approach could suggest that a particular morpheme is in competition

with a default form. Estonian's lack of null agreement would put this to a test— missing morphemes will be evident and insertion of a null default is not grammatical. This possibility will be discussed in Chapter (??).

As the Poeppel and Wexler (1993) study primarily uses word-order data to justify I and C, no conclusions can be drawn related to other I and C-related behaviors, such as nominative case-marking, questions, and imperatives. Eisenbeiss et al. (2006) found that structural case-marking was accurate for German L1 learners but that lexical case was error-prone, suggesting that the syntactic system was in line with the Strong Continuity approach, though lexically-based case forms must be learned.

Though the structure of the DP was not addressed by Poeppel and Wexler, a Strong Continuity view suggests that both Poss and D functional projections should be available to the learners. Case-marking of possessors, being structural, should also be mostly accurate. Errors in number agreement on possessors would be consistent with Poeppel and Wexler's view of child grammar, though case-marking and word-order should be adult-like. Movement operations will also be available, so possessors will appear in an appropriate place toward the left edge of the DP. Félix-Brasdefer (2006) examined longitudinal data from three children learning Spanish between 1;7 and 2;5 and found evidence for Strong Continuity. Subject agreement, tense, negation, and complementizers were all analyzed, requiring a particular morpheme be used in at least two different lexical items before it was considered acquired. Agreement evidence was found at the very start— between 1;7 and 1;9— for first and third person singular. Like the previously cited studies, agreement in all singular contexts appeared before agreement in plural contexts—earlier plural subjects included no agreement morphology or using the 3SG forms. These results not only conform to the continuity expectations but also to the predictions of the hierarchy in Harley and Ritter (2002). The early appearance of this data is encouraging support for a strong-continuity

hypothesis, though this analysis is not without problems. The third person singular morphology is unmarked, consisting of just the verbal root and the verb's theme vowel. First person agreement, which has unique morphology, is attested at this point, though to a lesser degree than third person. Evidence for tense was also found very early for two of the children at 1;7, though the third child showed no tense alternations until near the end of the data collection period. Negation was appropriately used by all children throughout the recorded sessions.

Imperatives and correctly formed *wh*-questions served as evidence for an adult-like CP. Questions actually appear a bit later in the children's data, ranging from 1;11 to 2;2, though one of the children only produced one question, and only at the oldest period. Imperatives were found in two children's data, though not until 2;3 and 2;4, though the imperative, like the 3SG present, is also identical to an uninflected verb and could be analyzed much differently—for example, as a bare verb without additional syntactic structure. Despite the generally later display and sometime absence of the complementizer data, Félix-Brasdefer takes this to be evidence that the C category is essentially present from the beginning. Borer and Rohrbacher (2002) also argue for Strong Continuity, suggesting that *missing* functional material is in fact *evidence* of functional structure. This result comes from the non-random nature of functional material in child language. If there were no functional structure in child language, they argue, then functional material should appear unsystematically and unconstrained throughout child-speech. That it does not suggests something is limiting the types of utterances a child produces. This is contrasted against the speech of adults with speech pathologies, who are shown to produce language with random errors. Phillips (1995) likewise finds the consistent types of error in child production to be the result of an adult-like grammar that has difficulty with accessing morphological knowledge.

Assuming that all the functional structure is available to the child means that missing inflectional information is the result of a morphological rather than syntactic deficit, as in Phillips (1995). Inconsistent use before some point only indicates trouble with the particular vocabulary items— the correct features will be present but the wrong VIs inserted into terminal nodes, whereas a maturational or weakly continuous approach relies on the unavailability of the relevant functional heads. A missing [+Animate] feature on a determiner would lead to *her* being spelled out as *it*, or a missing [+DEF] could lead to incorrect agreement morphology in Hungarian. Poeppel and Wexler (1993) use German word-order differences as evidence feature sets and functional categories clearly. When only morphology indicates the presence of a particular projection or word order is freer, as in the study languages here, the inventory of features/feature-bundles are more difficult to assess. Focusing on morphosyntactic features and functional categories as feature-bundles themselves suggests one potential flaw in a Strong Continuity approach. This position requires that functional categories are distinct from the morphosyntactic features that are realized on them: T exists even if tense, nominative case, and agreement (the comprising features) do not. Strong Continuity proponents assume the existence of independent functional categories to be the null hypothesis, but this may not be correct. If functional heads are just bundles of features and these features must be learned, it is unclear what the functional structure *is* that already exists. To rescue Strong Continuity, it would have to be said that even if children do not already have full projections like CP in their grammar, they are capable of learning C-related features (like Force, for example) from the start. All the features would be available to children and the operations (Merge, Move, Agree) as well, but the children would have to learn the features and how they go together. This would effectively push them toward Weak Continuity, to be discussed next.

A feature-geometric approach that goes beyond pronouns and attempts to organize broader categories may provide some guidance here—different root nodes for different elements of the grammar, for example, may be available at the start, guiding child grammars in a constrained way, with related features appearing over time. Strong Continuity’s assumption of full-functional structure, as Borer and Rohrbacher (2002) point out, explains why children’s utterances are constrained, but it does not offer any obvious answers to the questions about why certain categories appear first. Pinker (1984)’s semantic bootstrapping could provide the primitive structure, or functional projections specified with inherent category defining extended projections (Grimshaw, 2005) like [+N] and [+V] could form the initial structure that are elaborated on over time. The next approaches represent attempts to understand the acquisition paths that are attested in child language while maintaining the parsimonious benefits of maintaining a single continuous grammar.

### 1.3.2.3 WEAK CONTINUITY

The Weak Continuity approach differs from Strong Continuity in that it acknowledges and seeks to explain differences between child and adult grammars, in particular as they relate to functional items. Unlike the Maturational view, however, there is no step-wise change from a child state to an adult state but functional structure is developed gradually but continuously. The two approaches outlined here both provide a way to account for early grammar complexity and provide a means to explain the change of a grammar from an initial state to a final state.

Using alternations between accusative and nominative case-marking in English acquisition, Vainikka (1993) makes a case for one version of the weak-continuity hypothesis. Using a large corpus of speech from three children between 1;1 and 5;1 and focusing on the case-marking of subjects, she identifies three distinct stages of



language development: utterances which are only VPs, followed by utterances with TP+VP, and finally CP+TP+VP utterances. In this first stage, nominative subjects are used rarely, followed by a stage with both nominative and oblique subjects, leading eventually to the adult-like grammar.

Case-marking alternations are due to the interaction between the functional category responsible for nominative case-marking (T) and the gradual but steady development of the child's syntax. Early oblique case-marking of subjects is due to the lack of T in early child language. When C-level morphemes such as *wh*- words, first occur, they do not appear in CP, but in the specifier of T, which precludes movement of the subject to this position. The result of this is that subjects in questions will remain in an oblique case. This intermediate stage lasts for several months after the first appearance of *wh*-questions. Once full C projections are acquired, pronominal subjects appear in the appropriate nominative case.

Vainikka assumes that case-assignment is the result of a Spec-Head configuration alone—nominative is assigned to whatever is in SpecTP and the oblique cases are assigned by nouns and verbs. Current assumptions about case assignment require a different explanation. The availability of a functional head entails a specifier position, and an Agree relation in addition to an EPP feature could explain movement to this position, so Vainikka's assumption can be maintained to some degree. What changes is the explanation that a *wh*- item in SpecTP can block assignment of nominative case. One possibility is that constructions like these lack T entirely, which is consistent with the general relationship Vainikka found between nominative case and inflection and modals. Unlike adult grammars, *wh*- elements at this point could be in C, selecting a VP with the oblique subjects being in SpecVP. This loses the smooth VP to IP to CP transition she suggests, but it is line with Hegarty (2005)'s ideas about the development of functional categories, which I turn to now.

Hegarty (2005) begins from a position similar to the strong-continuity approaches, suggesting that children's grammar may contain all the relevant functional *features* from the earliest stages. The important distinction that makes his approach a weakly continuous one is that he considers atomic features to be the important elements of acquisition, not functional categories themselves. This may seem like a small point—functional categories are just feature bundles themselves. Importantly, the distinction allows a focus on individual elements of the grammar independently. Elements of a single adult functional head such as T (verbal subject agreement, nominative case marking, tense) may all be considered separately. For the purposes of possession, the uninterpretable  $\phi$ -features driving possessor agreement are the same features that drive agreement on verbs, while a DP's need for case is important for both possessors and subjects. Hegarty suggests that children may acquire functional features as soon as they learn the associated vocabulary items/morphemes, but they do have pre-existing functional projections waiting to have the appropriate features assigned to them beforehand. As they learn morphosyntactic features, children may incorrectly bundle various functional features together into non-adult-like functional heads. For example, T may be described as a functional head with a tense feature with unvalued  $\phi$  features, and an EPP. A child may only acquire a partial bundle initially, missing a feature present in the adult grammar or simply not including it in the appropriate bundle. Acquisition is limited by the gradually developing ability of the child to process and build additional functional heads. Children proceed stepwise from being able to process just one functional head at a time to two, three, four, *etc.* Pressure from processing constraints force children to put combinations of functional features together into a single functional head in ways that adults do not. To illustrate, consider the features for Tense, Nominative Case Assignment, Agreement, and [WH]. In a mature grammar, these first three will be combined to form T and the last will

be associated with C. In the developing grammar, however, a child may learn these features but incorrectly develop a hybrid category that is [+WH] and assigns nominative case. As the child learns the language, the features will be disassembled into the correct functional heads and as processing power increases, the child will make use of a growing number of functional heads.

Hegarty limits the analysis to just a handful of features related to C, I, and Neg (Q, WH, Tns, NOM, Neg), though a much larger or more diverse set could also be taken into consideration. Using three children between 1;9 to 3;5, Hegarty notes the first appearance and first evidence of a productive paradigm for each of the features. After this, the increasing level of phrase structure complexity is calculated across the samples. Finally, the first appearance of the various features were mapped against the increasing complexity. The results show that the overall potential phrasal complexity required to support distinct numbers of functional categories always precedes the actual use of distinct functional categories.

For example, consider the sentences in (6):

- (6) a. I want to put the toys away,

$I_{fin} V_{fin} I_{inf} D N$ , *Peter age 2;01.18*

- b. Why can't we open this piano?

$C_{+WH} I+Neg I_{fin} V D N$  *Nina age 2;09.21*

The child Peter produces (6a) at age 2;01.18, which shows a *selectional chain*—meaning a sequence of constituents selecting another— of length five, (not including *away*, as it is not selected by the previous item). This shows that Peter is capable of producing long utterances. It is not until 3;01.20 that Peter produces an utterance with three *functional* projections. Hegarty does not include an example of one of Peter's

utterances with three functional projections, though (6b) is an example of one such utterance from the child Nina.

The conclusion Hegarty draws from this is that, though the functional features are available to the child and evident in the production from the earliest times, in line with a strong-continuity hypothesis, complexity constraints on the child's developing/maturing grammar cause the differences between early and end-state grammars. Hegarty summarizes the process as follows: "the maturation involved is actually the growth of a basic representational resource, rather than a growth of functional structure directly" (Hegarty, 2005:265). Generally, this approach allows for the acquisition of any single feature to proceed like the acquisition of any other feature in the language, without respect to how it is bundled in the adult grammar, while placing the responsibility for the unique nature of child grammar on the child's processing deficit. Hegarty does not constrain this acquisition— in principle 2SG may be acquired before 1SG, although a hierarchically organized feature set, like Harley and Ritter (2002), could also work in determining when particular features were produced.

This paradigm could easily be transferred to the acquisition of possession. It predicts that possessed nouns, which require more functional structure than simple nouns, may be produced at the same time subjects occur appropriately with verbs— that is, when a child can support two functional categories. A verb with a subject will require a functional projection to host the subject and a *vP* for the verb; a possessed noun will require a *Poss* projection and an *nP* below it. Each of these require two functional projections. However, a child will not be able to have a possessed noun as the subject of a sentence even while other subjects are allowed— a more structurally complex subject is ruled out at this time, as this would require three functional projections at a stage when only two are possible. To illustrate, the first two sentences in the simple structures in (7) will be possible whenever the child has the capacity

to produce utterances with two functional categories. The third example, with three functional categories, will not be produced until the child's capacity grows.

- (7) a. [ $_{DP}$  [ $_{PossP}$  My] hat]: Two functional categories
- b. [ $_{VP}$  [ $_{DP}$  Hat] fall ]: Two functional categories
- c. [ $_{VP}$  [ $_{DP}$  [ $_{PossP}$  My hat] ] fall ]: Three functional categories

Agreement within DPs may occur at the same time as verbal agreement, though both will only occur in situations where the target utterance does not require surpassing the functional category limit the child has attained.

This model suggests the possibility of a very fine-grained analysis and is very much in spirit with DM, though carrying out this sort of analysis requires many careful assumptions about how to describe the child's utterances. Every utterance has several possible structures, especially when movement is considered. Determining the appropriate structural description for a given utterance at a particular stage of development requires establishing specific guidelines that can be applied consistently across children, languages, and ages. Problems like these are discussed in more detail in the next section.

### 1.3.3 ACQUISITION OF POSSESSION

There are multiple compelling reasons to study the acquisition of possession. First, as was mentioned previously, possession may make use of case and agreement patterns just like subjects and verbs, yet it has not received as much attention. By comparing the development of agreement and case-assignment within a DP in possessives to subject agreement and case-assignment on verbs, an understanding of how the process of syntactic and morphological agreement is represented in the developing grammar

can be achieved. For example, if agreement morphology in possession develops along a distinct path from the agreement on verbs, such as appearing at a much different time or in a much different order, this is evidence that there is some important difference between the two. Differences could be the result of lower frequency in the input, a more complicated agreement paradigm, or a different underlying mechanism controlling agreement in the nominal domain that is acquired separately. Frequency normalization could potentially be useful for determining the effect of the first of these. Observed differences in the appearance of features in different domains would create problems for an acquisition approach that assumes that the features are the same, regardless of which particular bundles they appear in. An explanation would be needed if, for example, second person agreement was produced first on verbal agreement but much later in possession. If this were the case, it would suggest that the features were not being learned independently *u2SG*, but that a verbal agreement morpheme was learned first and a possessive agreement morpheme was learned second, with their similarity not playing a role in the learning. Alternatively, if a particular number/person agreement morpheme develops similarly across its instantiations, this is plausible evidence for an underlying similarity in the mechanism and the unity of their linguistic representation.

Radford (1998), studying non-target genitive subjects in English, suggested that deficiencies in the overall pronominal system (vocabulary items) led to non-target use of genitives as subjects, rather than any functional category deficiency. That is, they have a possessor projection assigning case, but the morphology is non-targetlike, resulting in incorrect case forms. Radford and Galasso, in a case-study of a single child, found that accusative possessors were most common initially, with genitive possessors slowly overtaking them, which they relate to a morphology developing on a similar time course within the DP and CP. Nominative subjects appear around the

same time as genitive possessors, and nominative possessors were never seen. Some example utterances they found are reproduced below:

- (8) a. That Mommy car, 2;6  
 b. That me car, 2;6  
 c. Baby have bottle, 2;8  
 d. Daddy's turn, 3;2  
 e. I want my key, 3;1  
 f. This car works, 3;2

These examples are typical of the types of utterances produced; early utterances, like the first three, have syntactic structure and make use of pronouns, though not in an appropriate way, missing Poss, genitive case, and agreement, respectively. The last three examples show these grammatical issues resolved, with the Poss head, appropriate case marking, and agreement morphology all apparent.

Rispoli (1998), studying the same phenomenon but limited to first person singular pronouns, noted that nominative subjects were mostly used correctly never used inappropriately, though children did use both genitive and accusative subjects incorrectly around 6% of the time, with particular children generally opting for one or the other. He ultimately comes to a phonological explanation, arguing that words with onsets are more salient for children, leading to problems acquiring the [1SG, NOM] *I* /aI/. While this may well be the case, it is only applicable to that particular pronoun paradigm. Schütze and Wexler (1996), alternatively, suggests that pronoun errors are the result of a case-assignment mechanism that is not fully developed. Gavruseva and Thornton (2001) shows how children will move *who* independently from *-s* where

an adult would move the entire DP unit *whose book* in a sentence such as *Who did you see t's book?*(=Whose book did you see?). This shows the independence of the possessive *-s* and the possessor as well as differences in pied-piping between child and adult language. These studies all highlight the importance of case in the study of English, though there is an opportunity to expand the target of research not only beyond English but beyond the nominative/tense relationship that has informed so much research.

#### 1.4 METHODOLOGY & PREDICTIONS

With the discussion of the variety of approaches to language acquisition complete, the discussion may now go to the particular approach advanced here, how it will be operationalized, and the predictions it makes.

The Minimalist/DM model assumes a system that combines roots and features into words and sentences. The posited CP-DP parallels suggest that many of the same features that are active in forming one are also active in forming the other. Examining the development of both CP- and DP-related morphosyntax in children can illuminate the relationship between them and show whether the parallels are artifacts of theoretical analysis or whether they are reflections of an actual underlying homology. The acquisition paths described above, save Hegarty's, share a view of the grammar where functional categories exist in some pre-specified form, differing in whether they are available from the start or don't "come online" until some later point. The task for the child is, in addition to learning the roots, selecting and learning the properties of the functional heads. The problem with this point of view is deciding which functional heads are to be included. C, T, V are easy to decide on, though categories like Poss aren't so clear. This is not just a question for acquisition but



for theoretical syntax generally— some scholars, like Rizzi (1997) or Cinque (1999), suggest every language as a wide range of often never pronounced heads. On the other hand, Bošković (2005), for one, provides evidence that some languages do not even have a DP.

Fortunately, this question seems testable in the sort of cross-linguistic comparison being developed. If the categories are given, then the differences between the languages should matter less and the acquisition path for children in each language should be similar: children will in a sense know what to look for. The other option is that the categories are not given and the children have to discover them themselves in the process. If this is true, then more morphosyntactic evidence for a functional head in the input should ease the acquisition process— allowing a child to posit a functional head earlier.

Understanding the acquisition process as learning roots and learnings heads/features allows some of the differences between the approaches to be reconciled. A child whose language resembles the Lexical-Thematic grammar Radford posits in his Maturational account is a child whose language is mostly roots, while the period of time where a child is vacillating between including and excluding functional material can also be placed in terms of including or excluding functional heads. Single word utterances without other morphology may be considered bare roots or roots combined with nominalizing/verbalizing heads, depending on one's view of the pronouncability of roots. These languages lack other grammatical features associated with these heads, such as gender for  $n$ , so it is unclear how one could determine when a child has acquired these heads. Another complication involves whether roots or  $n$ ,  $v$  take complements. If it is the functional heads which take complements, then the production of complements is indicative of the acquisition of these heads and thus functional material. This would be at odds with Radford, for whom functional material is only available at a later

stage of acquisition, though it would be consistent with a weakly continuous view. Ultimately, different views of acquisition can easily conform to different accounts of the characteristics of the roots and the most basic heads. Issues concerning the pronouncability and complement-taking properties of roots are discussed at length in Harley (2014)’s target article and the subsequent discussion.

Strongly Continuous approaches like Poeppel and Wexler (1993) are a bit harder to frame, as they take advantage of word-order for evidence of functional structure that does not necessarily have a morphological reflex. Studies like Félix-Brasdefer (2006), which also shows early evidence of functional material, demonstrate an acquisition of functional features not necessarily combined in the same way as in the adult state: for example, agreement forms which in the adult grammar necessarily represent both person and number only represented person in the child grammar. For this dissertation, it is assumed that functional categories, which are just feature bundles, and features individually do not have to be identical to the adult grammar to still be said to exist in the child grammar. Functional material can be learned at early stages, though it is possible and even expected that functional features be learned somewhat independently from their ultimate, adult-like state bundled into heads.

#### 1.4.1 LANGUAGE DETAILS

The languages under investigation are English, Estonian, and Hungarian. These languages were chosen not only because of the wide range of available data, but also because they represent morphosyntactic contrasts that could lead to different and interesting results. Table (1.1) shows the most important features in the related domains, the details of which will be addressed for each language in the following chapters.

	English	Estonian	Hungarian
DP			
Poss	Overt Assigns GEN	Null Assigns GEN	Overt Assigns DAT
AGR Pronouns	Null 1, 2, 3 persons M-Animate, F-Animate, Inimate	Null 1, 2, 3 persons	Person, # 1, 2, 3 persons
D Demonstratives	def, indef, null singular, plural distal, proximal	n/a proximal	def, indef, null distal, proximal
Extraction of Possessors	Disallowed	Disallowed	Allowed
Promotion of non-Possessors to Poss	Allowed	Allowed	Allowed
Concord	Demonstratives (Number)	Demonstratives (Number, Case) Adjectives (Number, Case)	Demonstratives (Number, Case)
CP			
T	Overt Assigns NOM, 1, 2, 3 Person on <i>be</i> 3SG on PRES verbs	Overt Assigns NOM 1, 2, 3 Person	Overt Assigns NOM 1, 2, 3 Person Definiteness
AGR			
Extraction of Subjects	Allowed	Allowed	Allowed
Promotion of non-Agents to T	Allowed	Allowed	Allowed

Table 1.1: Relevant DP and CP Features  
Shaded cells indicate features with most direct parallels across domains

The highlighted cells indicate which features are thought to be most amenable to a comparative analysis of acquisition. POSS and T both assign a particular case to their respective DPs, and both may host agreement features, which will also be represented in their pronouns. Importantly, these are all elements that are common enough in the first few years of child language that it is possible to study them. Though aspects like similarities in extraction and argument promotion are important to make the case for the parallelism between CP and DP, they are not common enough in child language to be useful variables to find. Pronouns, agreement, possessors, and subjects, on the other hand, are all relatively common and can be tracked.

Given the feature sets in Table (1.2), a child learning Hungarian will have morphological evidence for person and number features appearing not just on pronouns, but also on verbal and nominal agreement morphology. Estonian provides evidence for person features on pronouns and on verbal agreement, while English has evidence for these features only on pronouns and on verbs/auxiliaries in a very limited capacity. The differences in the environments where these features are found should be reflected in the acquisition paths: evidence for a feature in more environments should lead to earlier acquisition of the feature. Hungarian, following this logic, should have earlier person feature acquisition than English, as the number of environments where person appears is much larger. Likewise, evidence for a Poss head within the DP is more salient in Hungarian, where it has not only its own dedicated morpheme *-j-* but also agreement markers. English and Estonian do not show agreement, however the English coronals *-n* and *-s* which show up with null possessa and lexical possessors (*e.g.* on *mine*, *ours*, *John's*) should be better evidence for a functional category than the entirely null Estonian Poss head. This difference provides more concrete evidence for English learners than Estonians of the presence of this intermediate head.

	Hungarian	Estonian	English
Poss	$[\phi, \text{POSS}, \text{uCase}]$	$[\text{POSS}, \text{uCase}]$	$[\text{POSS}, \text{uCase}]$
T	$[\phi, \text{T}, \text{uCase}, \text{DefOBJ}]$	$[\phi, \text{T}, \text{uCase}]$	$[\phi_{3\text{sg}}, \text{T}, \text{uCase}]$
Pro	$[\phi, \text{Case}]$ (3 Person, 2 Number)	$[\phi, \text{Case}]$ (3 Person, 2 Number)	$[\phi, \text{Case}]$ (3 Person, 2 Number)

Table 1.2: DP and CP Features to be acquired

The acquisition of DP morphology in these specific languages allows interesting questions to be asked. A particular functional feature may appear on a variety of heads. The independence of these features and the divisibility of the heads should be evident in their acquisition. This might be manifested in different ways. One possibility is that a particular feature will appear in a variety of paradigms before any one paradigm is completely acquired. A [1SG] feature may be acquired in a few domains (pronominal, agreement) before any particular paradigm is filled out, so the question may be asked when a particular feature is acquired rather than a particular category or functional head. Alternatively, there may be no evidence that features are acquired in any way independently from the functional heads they appear with.

The question now is how to go about examining the acquisition of CP- and DP-related aspects of the grammar in order to draw meaningful conclusions. The first step is to find and organize the relevant data. To do so, transcripts from the CHILDES databases (MacWhinney, 2000) were examined for each language, choosing children for whom there is the widest range of data in the relevant, early stages of acquisition. Each child's data was hand-tagged, utterance by utterance, with the part of speech and any relevant morphology (including plurality, agreement, person, number, tense, aspect, etc.) This gave a larger corpus of tagged data from which to identify and analyze broad trends in the data.

From here, MLU was calculated, and the growth rate of important elements of the DP and CP were tracked. These items include overt case, pronouns, agreement, tense, and definiteness. Utterance-level analysis allowed the appearance of subjects and possessors to be tracked as well. These data together show how the CP and DP each grew in morphological complexity, which could be compared to each other, both within the production of each child and across children. This analysis will show whether there is a relationship between CP and DP acquisition, as well as how the morphosyntactic differences between the languages affect the acquisition trajectories of the children.

This description of the structure of language and the nature of acquisition lead to the research questions this study aims to answer. They are as follows:

- Does child language acquisition data provide evidence for a relationship between case assignment and agreement both within the clause and those phenomena within the noun phrase?
- Does the appearance of a particular feature or structural position in one domain predict its appearance in another domain?

The first question concerns the relationship between acquiring an uninterpretable case feature on Poss (assigning GEN/DAT) and on T (assigning NOM), e.g. developing the knowledge that nouns need case and these functional heads may assign it, and whether uninterpretable  $\phi$ -features that are reflected in agreement are acquired on Poss at the same time as on T. The second questions whether there is a relationship between the acquisition of uninterpretable features on different heads and a relationship between interpretable features and their uninterpretable counterparts—so between the acquisition of pronouns and agreement morphology. Additionally, the

structural positions defined by the functional heads (specifically SpecTP and SpecPossP) each host subjects and possessors. Not only may DP/CP parallels exhibit themselves in the features that are projected in each, but in how the availability of these positions relate to the acquisition of the thematic roles associated with them.

With the assumptions and model of the study now described and the questions posed, the process of answering those questions may begin. The following chapters will review the acquisition of the relevant linguistic features for each language, providing partial and provisional answers along the way. Afterwards, the results from each language can be synthesized to draw larger conclusions about language acquisition and the relationship between the various elements of the grammar.

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