

## CHAPTER 3

### HUNGARIAN

This chapter discusses nominal and verbal morphology in Hungarian and their acquisition in a first language context. Hungarian morphosyntax and agreement, both in the nominal and verbal domains, are discussed in the first section. Longitudinal studies of three Hungarian-learning children are analyzed in the second section, with an emphasis on the acquisition of agreement and case morphology. The final section compares the acquisition trajectories of each child and summarizes the findings. The results found suggest that the syntactic development of the DP and CP do show a striking resemblance to each other, but morphological reflexes of the parallels operate differently, seemingly more affected by frequency and the morphological complexity of the forms to be acquired.

#### 3.1 OVERVIEW OF HUNGARIAN

The important issues involved in Hungarian are the case and syntactic position of the possessor, though unlike Estonian and English, Hungarian possessa have an additional suffix that agrees with their possessor in person and number. This section will first provide an analysis of the morphology of both possessive and subject agreement and then will discuss the syntax and morphology of possessed DPs.

The first notable fact is that the agreement seen on possessa is very similar to the agreement seen on verbs. The clausal analogy between CPs and DPs has been

helpful for a wide range of languages, but the agreement in Hungarian, discussed first in Szabolcsi (1983), was one of the first pieces of evidence used in developing the comparison. To understand this parallel, the facts of agreement on verbs and possessives will be described in turn. Table (3.1) shows the agreement morphemes for both verbal paradigms as well as the possessive paradigm.

Subjective		Objective		Possessive	
-ok	1SG	-om	DEF, 1SG	-om	POSS, 1SG
-sz	2SG	-od	DEF, 2SG	-od	POSS, 2SG
∅	3SG	-ja	DEF, 3SG	-ja	POSS, 3SG
-unk	1PL	-juk	DEF, 1PL	-unk	POSS, 1PL
-otok	2PL	-jatok	DEF, 2PL	-otok	POSS, 2PL
-enek	3PL	-jak	DEF, 3PL	-juk	POSS, 3PL

Table 3.1: Morphemes and Features for all three agreement paradigms  
 Singular possessive agreement (red) is identical to the objective paradigm;  
 1PL and 2PL POSS ARG (blue) identical to the subjective forms.  
 3PL POSS AGR is same as 1PL objective (green)

Verbal agreement in Hungarian is sensitive to the  $\phi$ -features of the subject as well as definiteness of the object: the *Subjective* conjugation is used for intransitive verbs and verbs with indefinite objects, while the *Objective* conjugation is used with definite objects (Coppock and Wechsler, 2012). A minimal definite/indefinite pair and an intransitive sentence are shown in (1).

(1) a. én lát-om a madár-at  
 1SG.NOM see-1SG.DEF the bird-ACC  
*I see the bird.*

b. én lát-ok egy madár-at  
 1SG.NOM see-1SG.INDEF a bird-ACC  
*I see a bird.*

c. én           esz-ek  
 1SG.NOM eat-1SG.INDEF  
*I eat.*

It is important to note that Hungarian features extensive vowel harmony related to both the frontness and the roundedness of the vowels. To save space and simplify the current analysis, Hungarian examples will only be shown that involve back vowels.

Possessor agreement has morphemes in common with both verbal agreement paradigms. The agreement morphemes shown for the singular possessors with singular possessa are identical to the verbal agreement seen with the objective conjugation (shaded in blue in the table). Plural first and second person possessors with singular possessa have agreement morphology that is identical to the subjective conjugation (shaded in red). Complicating matters, third person plural possessor agreement, shaded in green in the table, shares a form with the objective 1PL form.

Possessed DPs trigger the objective conjugation when they are the objects of verbs. This suggests that the DEF feature and the POSS feature may in fact be the same feature, or that the POSS bundle contains a +DEF feature. This points toward an analysis where vocabulary insertion for agreement for plural possessors takes place after a +DEF feature is impoverished, explaining why plural possessive agreement uses the same vocabulary items as the subjective (indefinite) conjugation. This application of impoverishment is in line with Nevins (2011), which suggested impoverishment operations target morphologically marked feature combinations. Such a rule would take the form seen in (2):

(2) [+POSS, +DEF, +PL] → [+POSS, +PL]

This rule, however, would predict that the [3PL, POSS] combination should, like the other plurals, be identical to the subjective form for 3PL, which it is not. A more

specific vocabulary item for [3PL, +POSS] would allow insertion of *-juk* just in this case, which would only coincidentally share a form with [1PL, +DEF]. Alternatively, the suppletive form *-juk* shared between the [3PL, +POS] and [1PL, +DEF] could be a default agreement form, or some other impoverishment operation is active which affects [1PL, +DEF]. A detailed account of how vocabulary items are determined is required for a truly complete accounting of Hungarian morphology, though this will be left for another time. For present purposes, the current morphological analysis provides a sufficient description of the challenges facing the Hungarian learner.

Table (3.1) above only shows the agreement morphology in the case of singular possessa. When the possessum is plural, the suffixes on the possessum show their morphological composition more clearly, as can be seen in the right two columns in (3.2).

Person	Singular Possessum		Plural Possessum	
	Singular	Plural	Singular	Plural
1	-om	-unk	-ja-i-m	-ja-i-nk
2	-od	-otok	-ja-i-d	-ja-i-tok
3	-ja	-juk	-ja-i	-ja-i-k

Table 3.2: Head-Marking Suffixes for Possession

Each suffix is made of a possessive marker *ja*, followed by an *-i-* signifying the plurality of the possessum, and finally a person and number possessor agreement morpheme. The plural marker in Hungarian is generally *-k*, but plurality of the possessum is unique in being marked with an *-i-*, suggesting that vocabulary insertion of the [+PL] feature is context-dependent, as discussed in Embick (2010).

The examples in (3) illustrate agreement and plural morphemes for pronominal and lexical possessors in the nominative case<sup>1</sup>.

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<sup>1</sup>*Anti-agreement*, another morphosyntactic phenomenon at play here and to be discussed momentarily, results in some unexpected behavior in the 3PL examples.

- (3) a. az én kalap-om  
 the 1SG.NOM hat-POSS.1SG  
*my hat*
- b. az én kalap-ja-i-m  
 the 1SG.NOM hat-POSS-PL-1SG  
*my hats*
- c. a te kalap-od  
 the 2SG.NOM hat-POSS.2SG  
*your hat*
- d. a te kalap-ja-i-d  
 the 2SG.NOM hat-POSS-PL-2SG  
*your hats*
- e. az ő kalap-ja  
 the 3SG.NOM hat-POSS.3SG  
*his/her hat*
- f. az ő kalap-ja-i-(∅)  
 the 3SG.NOM hat-POSS-PL-(3SG)  
*his/her hats*
- g. a mi kalap-unk  
 the 1PL.NOM hat-POSS.1PL  
*our hat*
- h. a mi kalap-ja-i-nk  
 the 1PL.NOM hat-POSS-PL-1PL  
*our hats*
- i. a ti kalap-otok.  
 the 2PL.NOM hat-POSS.2PL  
*y'alls hat*
- j. a ti kalap-ja-i-tok  
 the 2PL.NOM hat-POSS-PL-2PL  
*y'alls hats*
- k. az ő(\*-k) kalap-juk  
 the 3SG.NOM(\*-PL) hat-POSS.3PL  
*their hat*
- l. az ő(\*-k) kalap-ja-i-k.  
 the 3SG.NOM(\*-PL) hat-POSS-PL-PL  
*their hats*
- m. a fiú kalap-ja-i  
 the boy hat-POSS.3SG-(PL)  
*the boy's hat(s)*
- n. a fiú-\*(k) kalap-ja-i-\*(k)  
 the boy-\*(PL) hat-POSS.3SG-PL-\*(3PL)  
*the boys' hats*

(3k), (3l) and (3n) display what is referred to as *anti-agreement*. With third person plural *internal*<sup>2</sup> possessors, the plurality of the possessor is represented only one time—on the possessor if it is lexical, and on the possessum if the possessor is pronominal. Complicating matters further still, this *anti-agreement* effect is subject to variability, especially in cases where the possessor is DP-external. There are several competing accounts seeking to explain this phenomenon (Dikken, 1999; Ortmann, 2011; Sutton, 2014), though it can be set aside for the time being.

Like English, there is also a distinct set of possessive pronominals used without a possessum, as seen in Table (3.3). These differ somewhat in their morphology compared to forms with an overt possessum, but their structure is similar and they provide more evidence for the syntactic structure to be proposed.

Person	Singular Possessum		Plural Possessum	
	Singular	Plural	Singular	Plural
1	enyém	mienk	enyéim	mieink
2	tied	tietek	tieid	tieitek
3	övé	övék	övéi	övéik
Lexical	baráté <i>friend's</i>	barátoké <i>friends'</i>	barátéi <i>friend's</i>	barátokéi <i>friends'</i>

Table 3.3: Possessive Pronouns in Hungarian- Forms with null possessa

Like the plural possessive DPs seen earlier, the morphological make-up of these constructions is relatively transparent— the structure of each is (roughly) Possessor-POSS-(Plural)-Person/number, as shown in (4):

<sup>2</sup>Possessors in Hungarian may be to the right or left of the determiner. *Internal* and *external* refers to their position relative to the DP. The unmarked form of possessed nouns is internal, between determiners and the possessa. External possessors, which may be either immediately before the determiner or even earlier in a sentence, are the result of pragmatic causes like focus or topic.

- (4) en-je-i-m  
 1SG-POSS-PL-1SG  
*enyém* 'mine (PL)'

Anti-agreement is seen with the possessive pronominals with null possessa just as with other instances of possessor pronouns— plurality of the possessor is only shown in the word-final agreement marker, not as apart of the initial possessor morphology, which would otherwise be expected to be *ők*. Likewise, the lexical possessors with null possessa, shown in the last row of the table, exhibit simply the possessive suffix and *-é* and possibly the null-possessum plural *-i*, but plural agreement does not occur.

Third person forms have a subtle wrinkle. Throughout the rest of the paradigm, the Poss morpheme is either incorporated into the agreement markers (as with singular possessa, *viz. kalap-om* 'my hat'), or surfaces as *-ja*, most clearly exemplified in examples with plural possessa. In the third person possessive pronouns, the POSS morpheme is *-vé*. Given that this only appears in this particular context where the possessive pronoun includes both the possessor and the rest of the possessive morphology in a single word, it is not hard to imagine that this is a highly specified allomorph. The sentences in (5) show the four possibilities for third person possessors with null possessa.

- (5) a. az    ö-vé           lát                   egy madár-at  
 DEF 3SG-POSS see-3PL.INDEF a   bird-ACC  
*His/Hers sees a bird*
- b. az    ö-vé-i           lát-nak           egy madár-at  
 DEF 3SG-POSS-PL see-3PL.INDEF a   bird-ACC  
*His/Hers see a bird*

c. az    ö-vé-k           lát                   egy madár-at

DEF 3PL-POSS-PL see-3SG.INDEF a   bird-ACC

*Theirs sees a bird*

d. az    ö-vé-i-k           lát-nak           egy madár-at

DEF 3PL-POSS-PL-PL see-3PL.INDEF a   bird-ACC

*Theirs see a bird*

The facts discussed so far show all the details of Hungarian possession in its simplest form, which is admittedly not very simply. The production data examined in Section (3.2) can largely be described with the level of detail presented so far- all relevant morphology and the basics of the syntax has been addressed. Nonetheless, the finer details of the structure and case-assignment must be discussed in order to both justify the clausal parallel itself and the similarities and differences between Hungarian and Estonian and English.

The structure of the DP and the position and case of the possessor are all closely related. Hungarian has very robust case morphology that appears on all DPs, though the case of the possessor is not terribly clear-cut. As was mentioned earlier, the possessor may appear in several positions relative to its DP, as illustrated in (6). When the possessor appears internally- that is, to the right of the determiner- it appears as nominative- without overt case morphology. If it appears to the left of the determiner, it appears with dative morphology- either *-nak* or *-nek*, depending on vowel harmony.

(6) a. a   fiú           kalap-ja

the boy.NOM hat-POSS.3SG

*the boy's hat*

b. fiú-nak   a   kalap-ja

boy.DAT the hat-POSS.3SG

*the boy's hat*



There are several approaches to explaining the case-alternation. Szabolcsi (1994) identifies the unmarked as being nominative and suggests the dative is assigned by D to a possessor in its specifier, though she also notes the same case-marker is used for other constructions not related to possession or other dative constructions. (For example, the suffix *-nak* is also the 3PL.INDEF verbal agreement marker.) Based on current assumptions, this analysis causes some problems. For this account to work, there must be two different types of Poss heads– one which assigns nominative case to the possessor after agreement and one which does not assign case at all. This latter type will only be licensed after a D which assigns dative to the possessor that has moved into its specifier. Alternatively, there is one Poss head which always assigns NOM to the possessor, but this possessor is obligatorily dropped when a co-referring DP is merged in SpecDP.

Another possibility, suggested by Dikken (1999), suggests both the possessor with overt dative morphology and the unmarked, nominative possessor are complements of a dative preposition, which may be either overt or null. Only the null variant may license the possessor to remain in situ. This explains the difference between the two case-varieties, though it severs the relationship between case-assignment and agreement, which is achieved via an independent Agr projection above the dative preposition.

Following Dikken’s insight that both types of possessors are underlyingly dative, Sutton (2014) suggests an intermediate functional projection, *Poss* assigns dative, triggering agreement with the possessor in the process. This allows a unified account of case and agreement within the nominal and for subject-verb agreement. To account for the differences in case morphology, an Impoverishment rule was posited which removes the DAT feature within the DP included in (7), while another set related rules shown in (8b) lead to the anti-agreement effects.

(7) +DAT  $\rightarrow \emptyset$  /  $\_ \text{Poss}$

(8) a. [+PL, +3]  $\rightarrow \emptyset$  /  $\_ \text{PossP}$

b. [+PL, +3]  $\rightarrow \emptyset$  / DP  $\_$

The impoverishment, active before vocabulary insertion occurs, explains why the morphology is at odds with the syntax while still maintaining identical structures and meaning. This account posits a specific structure of the DP and the location of the possessor. Internally, it will be in SpecPoss post-agreement and case-assignment, though there are several possible positions for the external possessor to land. The Hungarian possessor may be extracted to the edge of the DP, as in (9b), or all the way to the start of a clause, as seen in (9c), neither of which trigger the impoverishment of the DAT feature.

(9) a. Janos lát-ta az-t a Mari barát-ja-t  
 Janos.NOM see-3SG.DEF.PAST DEM-ACC the Mari.NOM friend-POSS-ACC  
*Janos saw Mari's friend*– Possessor in SpecPossP

b. Janos lát-ta Mari-nak (\*az-t) a barát-ja-t  
 Janos.NOM see-3SG.DEF.PAST Mari.DAT \*DEM-ACC the friend-POSS-ACC  
*Janos saw MARI's friend*– Possessor in SpecDP

c. Mari-nak Janos lát-ta az-t a barát-ja-t  
 Mary-DAT Janos.NOM see-3SG.DEF.PAST \*DEM-ACC the friend-POSS-ACC  
*It was MARI's friend that Janos saw.*– Possessor in SpecTopP

This suggests that, unlike English, the possessor may land in SpecDP and beyond. There are several reasons to believe that possessors move to this position. As noted

originally by Szabolcsi and in line with the UTAH (Baker, 1997), the fact that both internal and external possessors have the same theta role suggests they have originating position. A null resumptive pronoun in the internal-possessor position co-indexed with the external possessor would be in keeping with the spirit of the UTAH and explain how agreement occurs. This would require a different explanation regarding anti-agreement: both agreeing and anti-agreeing forms would have same internal structure. This approach also does not explain how the external possessor receives case.

Another question concerns *why* the possessor should ever move from the internal position, and the likely answer involves a topic or focus feature. Topic is an important part of Hungarian syntax– Kiss (2002) suggests the basic form of all Hungarian sentences is Topic-Predicate. The availability of a [+TOP] or [+FOC] feature within the DP, as discussed in Aboh (2004), may explain why possessors may move to SpecDP or futher in Hungarian while they are restricted from doing so in other languages.

The position of the internal possessor is less immediately clear. It must appear before the possessum and its adjectives, and after quantifiers and demonstratives, demonstrated in (10).

- (10) a. a LÉda párizsi kalap-ja  
           the Leda Parisian hat-POSS  
           Leda’s Parisian hat (Szövegtár, 2003)
- b. minden én vetk-e-i-m-ből  
           every 1SG transgression-POSS-PL-1SG-ELA  
           From all my transgressions (Károly, 1840)

- c. két János fi-a  
 two Janos son-POSS  
 John's two sons (Kiss, 2002)

These DPs suggests a basic structure as follows:

- (11) [<sub>DP</sub> D [<sub>QP</sub> Q [<sub>NumP</sub> (Num) [<sub>PossP</sub> PSR [<sub>nP</sub>[<sub>AP</sub> A ]]<sub>nP</sub> n ]-Poss ]-Num ]-AGR  
 ]-CASE ]

Following Kiss (2002), adjectives are adjoined to the *nP*, while quantifiers and demonstratives (which each may co-occur with determiners) are adjoined to DP. The root itself ultimately appears after whichever adjectives, demonstratives, and quantifiers are in the DP, with up to four morphemes adjoined to its right. Poss appears immediately to the right of the root, which means either Poss is the first head above *nP* or that Poss lowers to this position during morphological operations or that it takes an *nP* complement.

The first possibility would make a possessor in SpecPoss occur after quantifiers, which, as shown in (10b), is the case. Kiss, following Bartos (1997), suggests the possessor in base-generated in SpecPoss, moving up to an Agr projection. If the possessor is merged lower, at Spec*nP* and raises to SpecPoss following agreement and case-assignment, the correct order is found with respect to phrasal elements before the possessum. The realization of the suffixal morphology presents some problems still.

Recall that, as reflected by null-possessa forms like *enyém* ‘mine’ (see (4)), the possessa’s basic shape is noun-POSS-NUM-AGR. The AGR node is inserted post-syntactically, but this would still predict the AGR node to be adjacent to POSS, rather than separated by the number morpheme. This can be achieved via local dislocation following linearization, as shown in (??):

$$(12) \sqrt{root} \hat{\sim} NUM \hat{\sim} POSS \hat{\sim} AGR \rightarrow \sqrt{root} \oplus POSS \oplus NUM \oplus AGR$$

→ kalap-ja-i-nk, hat-POSS-PL-1PL, 'our hats'

With these basic facts of the possessive spelled out, a description of the merging, agreeing, and movement of a possessed DP is possible. Though the ultimate form of possessives in Hungarian are very different, the underlying structure is essentially equivalent to that proposed for English and Estonian. The differences mainly come from the ability of Hungarian possessors to be extracted from the DP and the realization of agreement. Figure (3.1) below illustrates the proposed structure, assuming head-final linearization<sup>3</sup>.

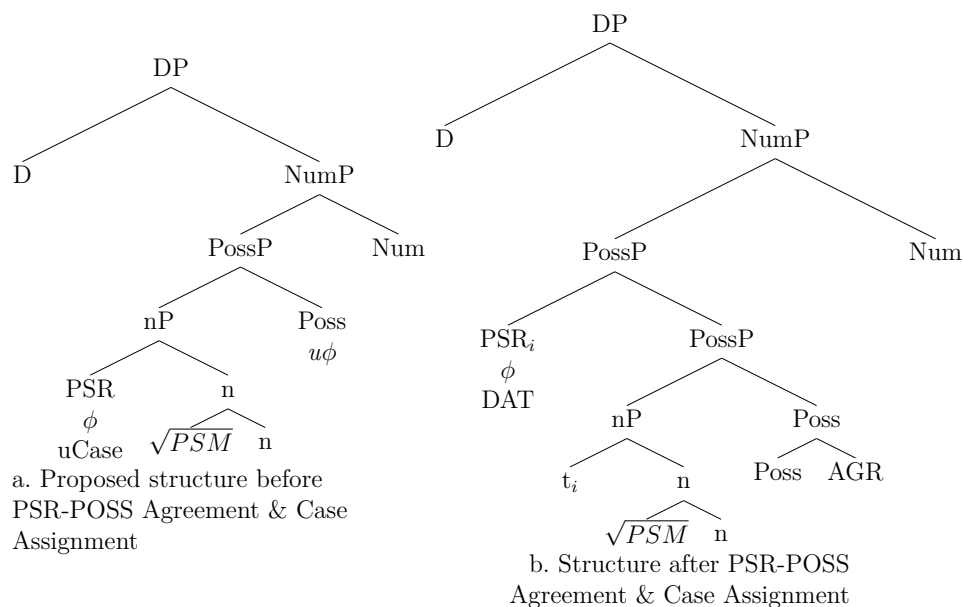


Figure 3.1: Syntactic structures for Hungarian possessive DP

<sup>3</sup>Hungarian is usually considered a head-final language, though it is not exclusively so. Kiss (2002) notes that while PPs and many elements in nominal indicate head-finality, the VP and CP are head-first, and D also appears at the front of the DP. This is reminiscent of Biberauer et al. (2013), where the possibility of variable properties in a single language lead to the discussion of *mesoparameters* (See Section (??)).

The normal Agree procedure takes place within the DP, with Poss probing and finding  $\phi$ -features on the possessor, assigning it dative case in return and moving it to SpecPossP. From here, the possessor may move to the specifier of the DP and beyond if it is merged with the relevant feature (topic or focus). As an "escape-hatch" position, possessors that have moved to SpecDP may move higher in the clause, as was shown in (9c). Szabolcsi (1994) notes that *wh*-possessors are dispreferred in DP-internal positions, suggesting that the same or similar feature normally responsible for *wh*-movement is also in play for possessor movement.

The syntactic structure is proposed to be identical for both nominative and dative possessors, with the dative morphology being impoverished when it remains in the DP (Sutton, 2014). The AGR node undergoes local dislocation, switching places with the *Num* head. A head-final linearization yields the surface order seen in (13):

- (13) a. D PSR<sub>[+DAT]</sub> *n*-Poss-AGR-NUM  
       Initial Linear Order
- b. D PSR [~~+DAT~~] *n*-Poss-NUM-AGR  
       Linear Order following Local Dislocation and Impoverishment

At this point, impoverishment rules may apply and vocabulary may be inserted. Typically, *Num* is realized as *-k*, though it must be context dependent and spell-out as *-i* in possessed environments.

Compared with English and Estonian, the Hungarian possessive DP is quite complicated, with many more features represented and optional movements. As such, it is expected that the Hungarian child will acquire all the elements of possession with greater difficulty than an English or Estonian child acquired the details of their language. Alternatively, because agreement appears on both nouns and verbs, a Hungarian child will be exposed more often to the agreement morphemes, which may give

them an advantage in acquiring them throughout the system. As will be shown and discussed in greater detail in Chapter (??), this latter possibility turns out to be the case.

### 3.2 ACQUISITION OF HUNGARIAN MORPHOSYNTAX

Having detailed the facts of Hungarian verbal and possessive agreement, the development of these categories in child language can be addressed. For the Hungarian children, special attention was paid to the presence of agreement morphology on verbs and nouns, case-marking on nouns, and the appearance of pronouns. MLU was calculated over time for each child<sup>4</sup>. The appearance of the various functional features was tracked and graphed according to both time and changing MLU to get a sense of how the children developed. Subsections (3.2.1) through (3.2.3) address each child in particular, concluding with a picture of how they compare to each other. Table (3.4) below summarized the available data analyzed for each child.

<b>Corpus</b>	<b>Speaker</b>	<b>Start</b>	<b>End</b>	<b>Sessions</b>	<b>Avg Utterances</b>	<b>Avg. MLU</b>
MacWhinney	Eva	2;07.12	2;10.27	7	290	4.1
Reger	Miki	1;11.02	2;11.26	30	284	2.6
MacWhinney	Moni	1;09.11	2;05.01	5	90.4	2.65

Table 3.4: CHILDES Corpora for Hungarian

#### 3.2.1 EVA

Eva averaged 290 utterances/session, with 7 sessions recorded between 2;07.12 and 2;10.27. Eva's MLU trends upward throughout the course of her recordings; however

<sup>4</sup>Every child utterance was manually analyzed for each session, giving a morphosyntactic description of each. MLU was calculated by taking the average number of (overt) morphemes in the middle 100 utterances produced by the child. Theoretically present but non-overt morphology, such as third-person singular agreement or NOM case, is used in the description of the utterance but was not used to calculate MLU. A comparison of the MLUs across language groups is included in Chapter (??)

the first two sessions, just days apart, show a significantly higher MLU than a session months later, though there is still a positive trend over time. Though there is a large amount of data represented for Eva, the fact that it covers such a relatively small period of time means that little can be gleaned from the trajectory her developing grammar takes. Nonetheless, even this long-exposure snapshot can give us a sense of how the different elements of the grammar relate to each other, especially when compared to the other children.

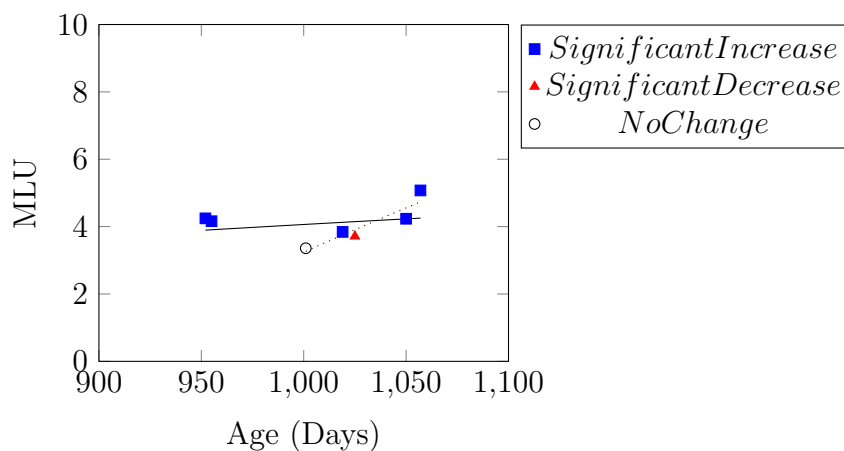


Figure 3.2: Eva MLU

Despite the abrupt change between 2;07 and 2;09, Eva still shows a general increase in MLU, though the linear regression has a very low  $R^2$  value, suggesting the upward trend is not statistically powerful. The dashed line, which shows the trajectory of just the last four sessions, however, fits nicely to a regression. A closer examination of the data, however, does not suggest anything unusual about either of the first two sessions. The takeaway is, perhaps, that there is relatively little change across these few months with regard to the total complexity. It does not, however, mean that the grammar is unchanging in its entirety, as the analysis of the other factors will demonstrate.



Figure (3.3) charts the percentage of pronouns as all nouns, percentage of nouns which show overt case, percentage of nouns which show agreement morphology, and percentage of verbs with agreement morphology. Nouns with agreement morphology increase steadily, though remain low throughout. Overt case is relatively stable, while verbal agreement and pronouns actually decrease. This overall decrease is mostly the result of an unusual second session during which both agreement rate and pronoun use rates are the highest they ever are. Without these outliers, the overall slope is much flatter. Taken together with MLU, this data suggests that most functional elements do not change over this period. Nominal agreement is the only category which increases, however slightly.

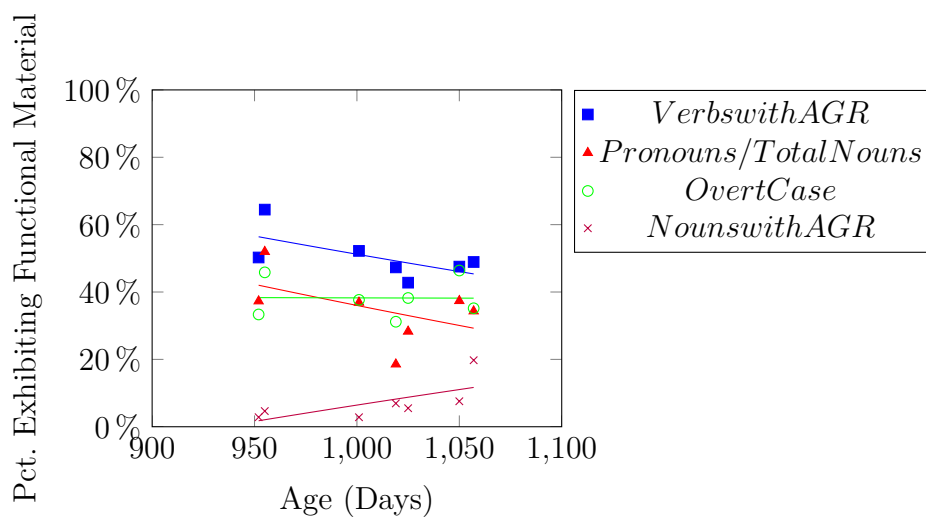


Figure 3.3: Eva Functional Heads Over Time

Table (3.5) shows the first time Eva uses a particular person/number combination, as well as the point at which there was evidence for the feature actually being acquired. An affix was considered acquired if it appeared on to two distinct roots or, in the case of pronouns, if it appeared in two distinct case-forms. The first session already contains evidence for full acquisition of many person and number combinations. What is most

interesting is the features that come later. Possessor agreement is always the last to be acquired. Additionally, second and third person plural are very rare. This can be attributed to either their featural complexity or low frequency– most conversations are between the child and her mother. Third person plural is more likely than second person to appear in a conversation, though it is still very rare.

P, #	Pronoun	2;07.12	2;07.15	2;09.19	2;09.25	2;10.20	2;10.25	2;10.27
1SG	Pronoun	Dark	Dark	Dark	Dark	Dark	Dark	Dark
	V-DEF	Dark	Dark	Dark	Dark	Dark	Dark	Dark
	V- Indef	Dark	Dark	Dark	Dark	Dark	Dark	Dark
	N Agr	Dark	Dark	Dark	Dark	Dark	Dark	Dark
2SG	Pronoun	Dark	Dark	Dark	Dark	Dark	Dark	Dark
	V-DEF	Dark	Dark	Dark	Dark	Dark	Dark	Dark
	V- Indef	Dark	Dark	Dark	Dark	Dark	Dark	Dark
	N Agr	Light	Light	Dark	Light	Light	Light	Light
3SG	Pronoun	Dark	Dark	Dark	Dark	Dark	Dark	Dark
	V-DEF	Dark	Dark	Dark	Dark	Dark	Dark	Dark
	V- Indef	Dark	Dark	Dark	Dark	Dark	Dark	Dark
	N Agr	Light	Dark	Dark	Dark	Dark	Dark	Dark
1PL	Pronoun	Dark	Dark	Dark	Dark	Dark	Dark	Dark
	V-DEF	Dark	Dark	Dark	Dark	Dark	Dark	Dark
	V- Indef	Dark	Dark	Dark	Dark	Dark	Dark	Dark
	N Agr	Light	Light	Light	Light	Dark	Light	Light
2PL	Pronoun	Light	Dark	Dark	Dark	Dark	Dark	Dark
	V-DEF	Light	Light	Light	Light	Light	Light	Dark
	V- Indef	Light	Dark	Dark	Dark	Dark	Dark	Dark
	N Agr	Light	Light	Light	Light	Light	Light	Light
3PL	Pronoun	Light	Light	Light	Light	Light	Light	Light
	V-DEF	Light	Dark	Dark	Dark	Dark	Dark	Dark
	V- Indef	Light	Light	Dark	Light	Dark	Dark	Dark
	N Agr	Light	Light	Light	Light	Light	Light	Light

Table 3.5: Eva  $\phi$ -feature Acquisition  
First Use (light) and Partial Paradigm (dark)

If a generalization can be made, it must be very general. Definite agreement is the first to appear, followed by indefinite agreement and finally nominal agreement. This is somewhat surprising from a complexity standpoint. Definite agreement morphology

entails both the regular number and person features as well as definiteness, not to mention it is only a possibility for transitive verbs. Furthermore, the input frequency is strongly in favor of indefinite agreement- 64% of verbs show this agreement, compared to 25% definite with the remainder non-finite forms. Nonetheless, definite occurs before indefinite agreement in all cases where a difference can be discerned.

Figure (3.4) provides a clearer example of the state of Eva's grammar at the point where she first uttered relevant morphemes. These examples provide some context for the complexity of her grammar as the morphological milestones are met. Because she was relatively advanced when recordings began, the very first session already has examples of a wide variety of feature combinations, and the utterances contain case, pronouns, negation and a variety of other functional elements.

What is interesting is that the features that appear later in the collection period often show up as a part of relatively short utterances. The average MLU throughout the period of the recordings is around 4; many of the later first appearances are part of utterances with only two or three morphemes. This points to some sort of processing limitation reminiscent of Hegarty- though Eva is capable of producing much longer utterances, when a new feature is called for, it does so in an environment that is otherwise uncomplicated. This tendency is repeated for the other children as well and seems to point toward an important factor in acquisition, as will be discussed in Section (??).

Unlike the situation with  $\phi$ -feature acquisition, the limited window with Eva does seem to show some interesting trends with regard to case. Table (3.6) shows the first appearance and full acquisition for various cases, divided by pronouns and full nominals. The most striking thing is the difference between the two- full nominals appear in nine different case forms. The only cases where full acquisition for pronouns occurs is the three grammatical cases: nominative, accusative, and dative. There are

## Age

	2;07.12	2;09.01	2;09.25	2;10.20	2;10.27
1SG	<div data-bbox="310 373 581 554" style="border: 1px solid blue; padding: 2px;">           odaad-om a hintá-t            give-1SG.DEF DEF swing-ACC  <i>i give the swing, 2;07.12</i>            én szól-ok            1SG speak-1SG.INDEF  <i>I wanted daddy, 2;07.12</i>            hát Bándiká-m            six Bándika-1SG  <i>My six Bándikas, 2;07.12</i> </div>				
2SG	<div data-bbox="310 585 581 722" style="border: 1px solid blue; padding: 2px;">           Andi hallod            Andi.NOM hear-2SG.DEF  <i>Andy heard it, 2;07.12</i>            nem jös-sz a kocsi-val            neg come-2SG the -COM  <i>You don't come with the car            2;07.12</i> </div>		<div data-bbox="649 753 920 821" style="border: 1px solid red; padding: 2px;">           kez-ed-et            hand-2SG-ACC  <i>your hand, 2;09.25</i> </div>		
	<div data-bbox="321 852 704 919" style="border: 1px solid blue; padding: 2px;">           te is em-mél áll-j            2SG.NOM also mom-COM stand-2SG.SUBJ.INDEF  <i>You stand with mom, too., 2;07.12</i> </div>				
3SG	<div data-bbox="310 947 693 1083" style="border: 1px solid blue; padding: 2px;">           kidob-ja a kuka-t            throw-3SG.DEF DEF trash can-ACC  <i>Throw away the trash can, 2;07.12</i>            Barna bácsi nézz-Ø oda mi-t csinál-t-am            Barna uncle see-3SG there what-ACC make-PAST-1SG  <i>Uncle Barney sees what I did.            2;07.12</i> </div>	<div data-bbox="483 1100 794 1226" style="border: 1px solid gray; padding: 2px;">           popsi-ja            rear-3SG  <i>his rear, 2;09.01</i>            ő elve-tt-et            3SG.NOM throw.out-PAST-3SG.INDEF  <i>He threw away, 2;09.01</i> </div>			
1PL	<div data-bbox="509 1255 781 1320" style="border: 1px solid blue; padding: 2px;">           most bezárjuk            now lock.up-1PL.DEF  <i>Now we lock it up, 2;09.19</i> </div>	<div data-bbox="321 1339 592 1404" style="border: 1px solid blue; padding: 2px;">           mi számol-unk            1PL.NOM count-1PL.INDEF  <i>textitWe count, 2;07.12</i> </div>	<div data-bbox="716 1409 987 1474" style="border: 1px solid blue; padding: 2px;">           vizes a kez-ünk            watery DEF hand-1PL  <i>Our hands are all wet, 2;10.20</i> </div>		
2PL	<div data-bbox="321 1598 630 1663" style="border: 1px solid blue; padding: 2px;">           készít-ek nektek kakaó-t            make-1SG.INDEF 2SG.DAT cocoa-ACC  <i>I make y'all cocoa., 2;07.15</i> </div>			<div data-bbox="1045 1503 1317 1568" style="border: 1px solid blue; padding: 2px;">           fekdj-etek le            lie-SUBJ.2PL down  <i>Lie down., 2;10.27</i> </div>	
3PL	<div data-bbox="649 1789 995 1854" style="border: 1px solid blue; padding: 2px;">           most a ember-ek utaz-nak            now man-PL travel-3PL  <i>Now the men travel, 2;09.19</i> </div>			<div data-bbox="1045 1694 1317 1759" style="border: 1px solid blue; padding: 2px;">           bont-jak a hang azért            cut-3PL DEF sound therefore  <i>So they cut the sound., 2;10.27</i> </div>	
				<div data-bbox="1031 1885 1263 1950" style="border: 1px solid blue; padding: 2px;">           hozzá-juk megy-ünk            3PL.ALL go-1PL.INDEF  <i>We go to them, 2;10.27</i> </div>	

Figure 3.4: Eva Example Utterances

Utterances which contain multiple target feature combinations are included only once

Case	Type	2;07.12	2;07.15	2;09.01	2;09.19	2;09.25	2;10.20	2;10.27
NOM	Pro	Dem						
	Nom							
ACC	Pro	Dem						
	Nom							
DAT	Pro						Dem	
	Nom							
ILL	Pro		Dem					
	Nom							
INE	Pro							
	Nom							
ELA	Pro							
	Nom							
ABL	Pro							
	Nom							
SUB	Pro			Dem				
	Nom							
COM	Pro	Dem						
	Nom							

Table 3.6: Eva Case Acquisition

First Use (light) and Partial Paradigm (dark)

First mention of Demonstrative indicated with *Dem*

TER/TEM/TRA/SUP/ALL/CAU/ADE/DEL do not appear in the data.

no cases that appear only with pronominals, and pronouns nearly always appear either later than or at the same time as lexical nominals in a particular form. The two exceptions are comitative and ablative.

A grammatical explanation for this difference could relate to the complexity of combining two functional items on a single head, D. Another possibility is that full nominals are much more common in the input in the different case forms. Table (3.7) shows this distribution. While full nominals do appear in the semantic cases at twice the rate of pronouns, the pronouns still do appear quite a bit in the input in the different forms. A close look at the input reveals a few case forms attested in Eva’s production (DAT, ADE, CAU) are actually more common on pronouns in the input than on nominals. This suggests that frequency is not the only factor and that a grammatical explanation is more appropriate.

	Pronouns	Substantives	Total
Nominative	63.8%	72.7%	70.7%
Accusative	17.6%	14.1%	14.6%
Dative	12.0%	1.4%	5.6%
Semantic	6.6%	11.8%	9.1%

Table 3.7: Eva: Percentage of Cases in Input

The next question to examine for Eva is whether there is any relationship between subjects and possessors. Figure (3.5) shows the change of possessors (in blue) and subjects (in red) as percentages of all nouns. The graph indicates a very modest growth in possessors over time, which corresponds to an actually large *decrease* in subjects. We’ve seen that nominal agreement slowly increases over time, but that verbal agreement, which goes hand-in-hand with subjects, actually decreases slightly in the same time period. This slight decrease might be simply noise in the data, reflecting an actually stable grammar during the short period in question, or it could reflect an addition of non-agreeing verb forms in the data. Likewise, subject growth will be

seemingly diminished by the addition of nouns generally— such as verbal arguments and possessors/adjunct nominals.

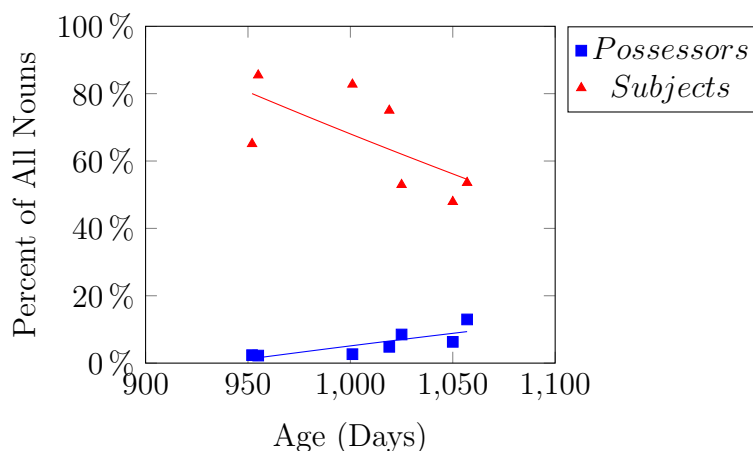
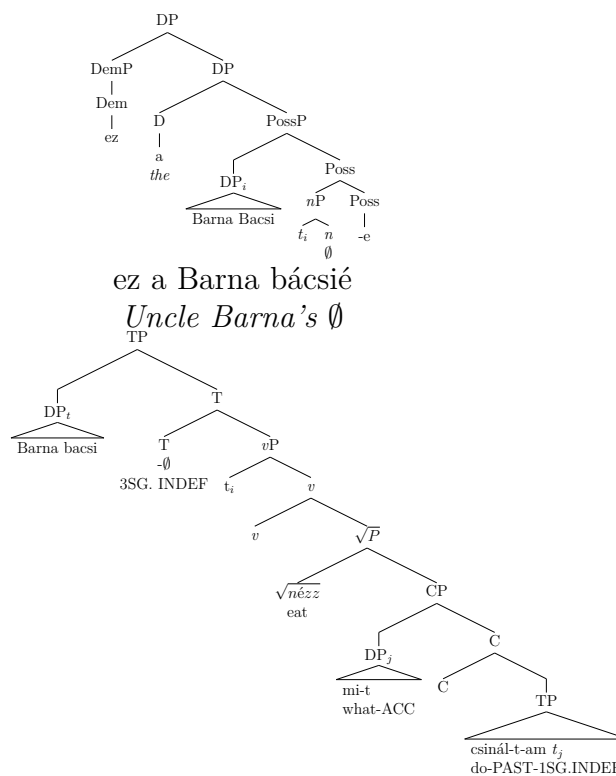


Figure 3.5: Eva Subjects and Possessors Over Time

Finally, the relationship between the structural development of the CP and the DP can be addressed. Though until now the focus has primarily been on either morphological realizations or semantic/syntactic development in the case of possessors and subjects, development of syntactic structure will be covered next. Table (3.8) shows the largest nominal and verbal phrases produced during the sessions in which the first evidence for different aspects of the nominal and verbal extended projections appeared.

Again, due to the later stage of Eva’s development, there is no pattern or trend to be found— the first session contained the highest syntactic projection under investigation for both DPs and CPs. Nonetheless, there may be an interesting result in the lack of a pattern. If the CP and DP were not developing in parallel, it would be possible to have a fully developed CP with all the required projections necessary for conveying a wide variety of meaning while still having a low-complexity DP.

2;07.12  
First D  
First C



Barna bácsi nézz mit csináltam .

*Uncle Barna sees what I did.*

Table 3.8: Eva Structure Development



Alternatively, because CPs necessarily contain DPs, the CP could reasonably lag behind DP development. Neither of these options are seen: complexity, understood in terms of functional structure though not necessarily length, is matched in the development of each. In fact, the most complex DP itself contains another DP (the possessor), and the most complex CP contains another CP. Though it is only a single data point, it confirms the expected result.

Summarizing Eva's results over the three and a half months, there are no clear answers regarding the initial research questions. Verbal agreement for both conjugations far precedes nominal agreement, and subjects and possessors do not seem to develop with any relationship to each other. The piece of evidence most supportive of the idea that the theoretical parallels guide acquisition is the fact that overall complexity of the DP and the CP are similar. All that said, the very small and late window into Eva's development are may obscure trends that might otherwise be discovered. The other Hungarian children will provide a more detailed picture.

### 3.2.2 MIKI

Miki was recorded for 30 sessions between 1;11.02 and 2;11.26. Unlike Eva, all the data for Miki suggests a clear upward trajectory for all factors considered, likely helped by the wide range of ages covered and the very large number of sessions. MLU, shown in Figure (3.6), increases regularly over time, with high  $R^2$  values indicating the trends accurately map the growth of the child's grammar. The blue dots in the graph indicate sessions with significantly higher MLU ( $p > .05$ ); the preponderance of blue dots shows a very steady and regular increase in complexity across the sessions.

Given that the utterances are growing steadily in complexity, we expect to also see a growth in functional material. This expectation is borne out: the presence of functional material, shown in Figure (3.7), also increases steadily throughout the

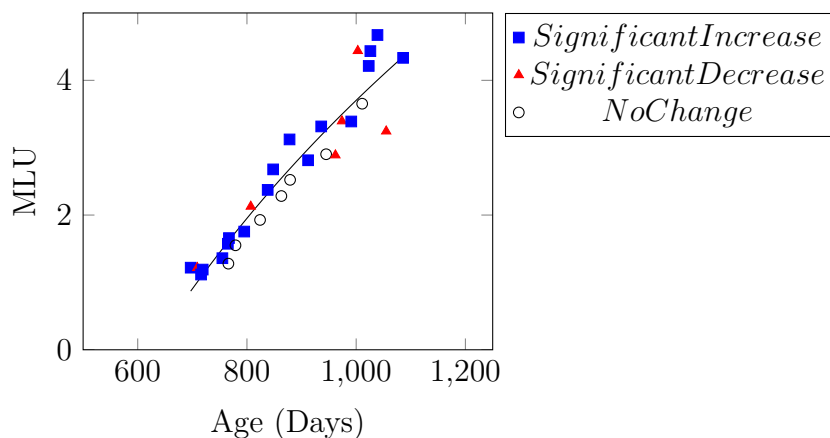


Figure 3.6: Miki MLU

period of recordings. Verbal agreement in particular moves to more than 70% by the end of the sessions. Growth in pronominal and overt case percentage shows that the growth is not limited to aspects of the verbal domain. Agreement on nouns is low throughout, though it does exhibit some growth. This is to be expected due to low overall instances of possession.

The initial results from these two tables show a grammar that is developing quickly and in both the relevant domains. For a closer look, Table (3.9) shows the development of different person and number combinations seen in the various functional heads on which they appear. Typically, a feature combination appears first as a pronoun, indicated in blue. Like Eva, there is a tendency for definite agreement to appear before indefinite agreement, with nominal agreement the last way for a feature combination to be manifested.

With regards to the order in which different combinations show up, they are largely in line with the predictions made by Harley and Ritter. First person features appear first, followed by third. Somewhat surprisingly, first person plural appears

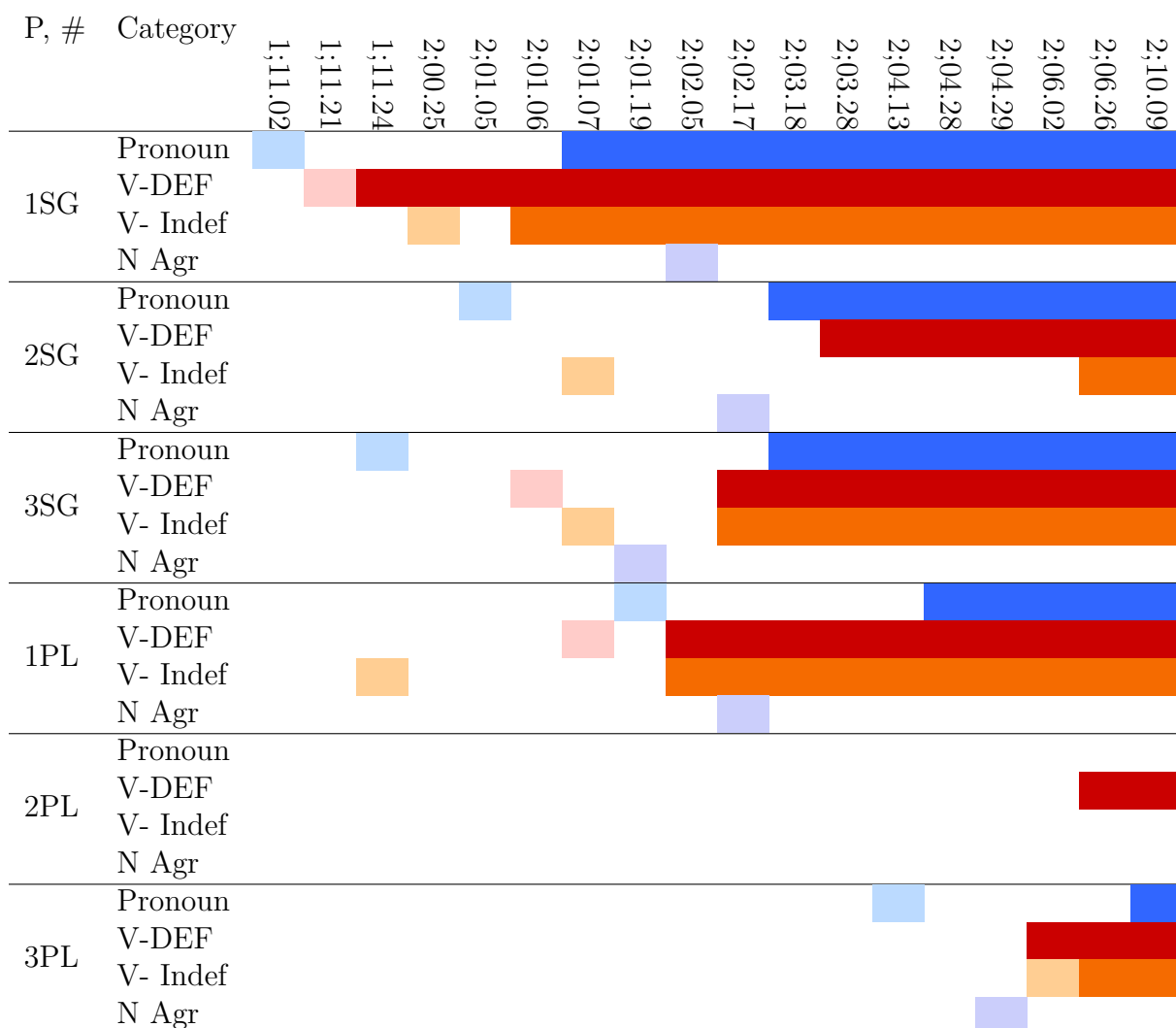


Table 3.9: Miki  $\phi$ -feature Acquisition  
 First Use (light) and Partial Paradigm (dark)

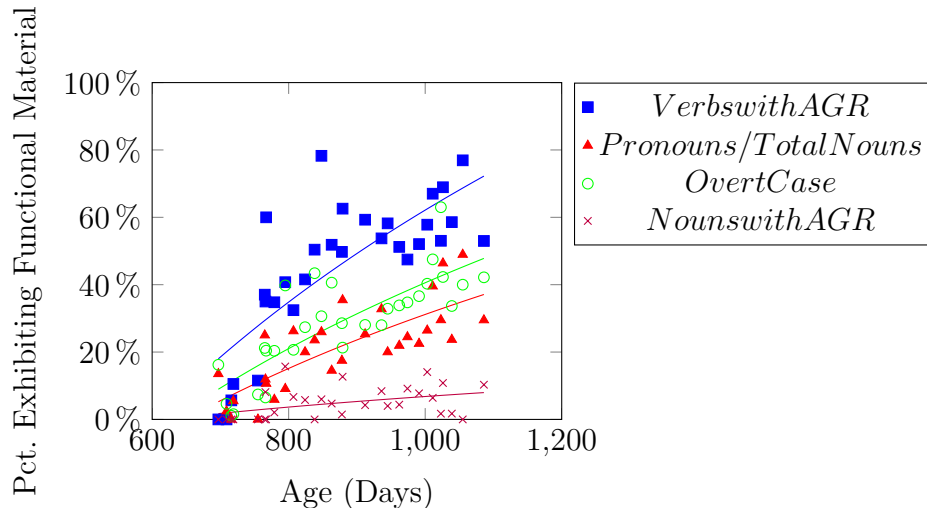


Figure 3.7: Miki Functional Heads Over Time (Percentage)

before second person singular. The other plural forms appear much later in all case forms, with second person plural being nearly absent from the data except for definite agreement, which appears at the second-to-last session. Regarding DP/CP symmetries, we get somewhat conflicting information. Feature combinations first appear as D, then later as agreement, and only finally as nominally-internal agreement.

Figure (3.8) provides a clearer example of the state of Miki’s grammar at the point where she first uttered relevant morphemes. These examples provide some context for the complexity of her grammar as the morphological milestones are met.

The utterances highlight the growing complexity as new features are introduced, just as was seen with Eva. First instances of a feature often occur in utterances with lower than the average MLU at that period of time, as if Miki were using extra effort to produce the new morphemes, consistent with the idea that the number of distinct

Age	1;11	2;01	2;03	2;05	2;07	2;09
1SG	kér-em ask-1SG.DEF <i>I want (it), 1;11.21</i>	hol lak-ik where live.1SG.INDEF <i>Where do I live?, 2;02.17</i>	öl-öm-be lap-1sg-ILL <i>Into my lap, 2;02.05</i>			
	én is 1SG also <i>Me too., 1;11.02</i>					
2SG				becsuk-od az ajtó-t close-2SG DEM door-ACC <i>You close the door., 2;04.13</i>		
				azzal lesz tű DEM.COM come-2SG.INDEF needle <i>Come with this., 2;04.13</i>		
				fáj a kar-od hurt-3SG.IND DEF arm.2SG <i>Your arm hurts., 2;03.04</i>		
			te vagy a buta 2SG.NOM be.2SG DEF dumb <i>You're the dumb one., 2;02.17</i>			
3SG			anyu becsuk-ja? mother close-3SG.DEF <i>Mom turns (it) off?, 2;02.17</i>			
		ő eső-n-e . 3SG.NOM get.wet-COND.3SG.INDEF <i>It would get wet., 2;00.12</i>				
		vég-e end-3SG <i>Its end., 2;01.06</i>				
1PL	megcsinál-juk? make-1PL.DEF <i>We make it., 2;00.12</i>		épít-s-ünk build-COND-1PL.INDEF <i>We would build., 2;02.17</i>			
				ez mi anyu? DEM 1PL mother <i>This our mom?, 2;04.13</i>		
2PL					föllök-ték learn-2SG.DEF <i>Y'all learn., 2;07.22</i>	
3PL					kidob-ják az eger-et throw.down-3PL.DEF DEM mouse-ACC <i>They throw down this mouse., 2;06.02</i>	
				ugjáj-nak v-3PL.INDEF <i>They ?, 2;04.29</i>		
				ez legyen a gazdá-juk DEM be.3PL D farmer-3PL <i>This is the farmer's?, 2;04.29</i>		
				ők butá-k 3PL dumb.PL <i>They're dumb., 2;04.13</i>		

Figure 3.8: Miki Example Utterances  
Utterances which contain multiple target feature combinations are included only once

feature and syntactic complexity of words and utterances influence the children as their grammar develops.

Case acquisition, depicted in Table (3.10) is broadly similar to Eva, though with a more dramatic difference between pronouns and full nominals. Acquisition of a paradigm is only evidenced for the grammatical cases on pronouns, and in every instance the semantic cases appear on a full noun before they appear on a pronoun.

Case	Name	1;11.02	1;11.14	1;11.21	1;11.24	2;01.06	2;01.19	2;02.05	2;02.17	2;03.04	2;03.18	2;04.28	2;06.02	2;06.26	2;07.05	2;07.22	2;10.09	2;10.25	2;11.26
NOM	Pro		<i>d</i>																
	Nom																		
ACC	Pro	<i>d</i>																	
	Nom																		
DAT	Pro																		
	Nom																		
ILL	Pro		<i>d</i>																
	Nom																		
INE	Pro											<i>d</i>							
	Nom																		
ELA	Pro									<i>d</i>									
	Nom																		
ABL	Pro																		
	Nom																		
SUB	Pro																		
	Nom																		
COM	Pro										<i>d</i>								
	Nom																		
CAU	Pro														<i>d</i>				
	Nom																		
DEL	Pro																		
	Nom																		
ADE	Pro																		
	Nom																		

Table 3.10: Miki Case Acquisition  
 First Appearance (light), Paradigm (dark). *d* signifies first appearance of demonstratives

The grammatical explanation for the difference in the development of case on pronouns versus nominals might involve the difficulty in combining two functional features at once, compared to the relative ease of combining a lexical noun with a single, functional case morpheme.

Looking at the breakdown of the case forms attested in the input in Table (3.11), it can be seen that there are a wide variety of pronouns in all case forms in the input. Not surprisingly, the portion of dative pronouns is quite high compared to dative nominals. This large difference might be reflected in the relatively early appearance of dative pronouns in Miki’s production. On the other hand, accusative is very similar on nouns and pronouns, yet it is late in the production data, again suggesting a grammatical development issue independent from input concerns.

	Pronouns	Substantives	Total
Nominative	60.3%	68.0%	66.0%
Accusative	21.9%	18.0%	18.9%
Dative	6.3%	1.6%	3.1%
Semantic	11.6%	12.5%	12.0%

Table 3.11: Miki: Percentage of Cases in Input

Demonstratives appear mostly prior to personal pronouns, a result seen in the Estonians as well as Eva. Though they are grammatically similar to pronouns and certainly are functional items, demonstratives appear with a wide variety of cases and often very early in the data, more similar to lexical nouns. This suggests a difference in the way they are represented in Miki’s grammar. Recall that, unlike English and Estonian, Hungarian demonstratives may appear along with determiners, and they may appear by themselves, characteristics shared with nominals.

Moving beyond the morphological realizations on nominals, the semantic/syntactic evidence for possessors and subjects is examined in Figure (3.9). Though the data does not show consistent upward growth like the morphological development, there

is still some growth shown in both. Subject rate, indicated in red, grows more consistently and rapidly. Though a developing grammar will allow more and more room for adjuncts and other arguments as well as null-subjects, which all could conceivably actually lower the portion of subjects, growth in subjects does in fact increase. For possessors, on the other hand, evidence for growth is much less clear.

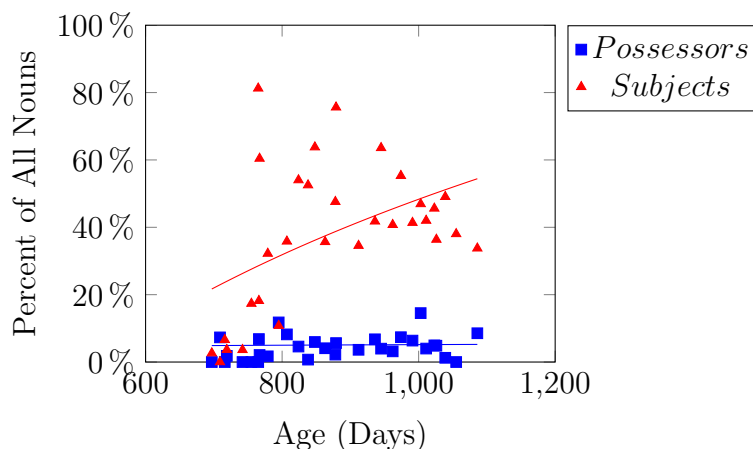


Figure 3.9: Miki Subjects and Possessors Over Time

By itself, this type of growth refutes the possessor/subject parallel argued earlier, though a brief look at the development of Miki’s syntactic development of nominal and verbal phrases in Table (3.12) supports it. These trees were simplified to show relevant structures only— missing projections include NumP within the noun, as well as a complex verb *elmegy*, which is made of two morphemes, *el-* ‘from’ and *megy* ‘go’. Nonetheless, they provide a good picture of the type of structure represented in Miki’s utterances at the various points.

These trees actually show a very close correlation between the types of structures available to the child at any point. The first session only has very simple nouns outside of a larger syntactic structure beyond the  $\sqrt{P}$ ; and the most elaborate verbal phrase was simply negation and a verb. A few weeks later, however, the most complicated



	Largest Nominal Projection	Largest Verbal Projection
<p><b>1;11.02</b> First N First V</p>	<p>homo(k) <i>sand</i></p>	<p>nem ja <i>don't play</i></p>
<p><b>1;11.14</b> First Poss First T</p>	<p>enyé <i>mine</i></p>	<p>elment <i>He left.</i></p>
<p><b>2;01.07</b> First D First C</p>	<p>azt a cumikát <i>these pacifiers</i></p>	<p>mit esznek? <i>What do they eat?</i></p>

Table 3.12: Miki Structure Development

nominal and the most complicated verbal projections each contained an additional functional projection above the root. Most interesting about this session is that the TP has a null subject while the nominal has a null possessum. Both contain morphological evidence of the intermediate head (*-t* and *ye*, respectively). Agreement is, appropriately, null on the verb, however the obligatory agreement on the noun is not produced, showing that while the syntax is adult-like, the morphology is not.

Finally, two months later there is data for both full DPs and full CPs, evidenced by a DP including both a demonstrative and the definite determiner and [+WH, +Q] CP. Agreement appears in the CP and while this particular DP does not have a possessor and so does not require agreement, there are examples of case-concord on the noun and demonstrative. Despite the unclear examples from the morphology data examined above, the maximal syntactic complexity for the two domains does seem to develop in striking parallel.

### 3.2.3 MONI

Moni was recorded for six sessions between 1;09.11 and 2;06.01, with an average of just 120 utterances per session. Nonetheless, her data shows a steady trajectory for all categories tracked. Figure (3.10) shows a steady increase of MLU across the sessions, with a strong positive correlation between age and length of utterance.

Moni's functional vocabulary also increases steadily across time. Most notably, the percentage of verbs that appear with agreement morphology increases regularly, especially at two years old, at which point there is a big increase. There is also a notable increase in nouns with overt case at this point, suggesting Moni has successfully posited functional heads that were not a part of her grammar before and developed the morphological-merger required to form these complex heads (Matushansky, 2006).

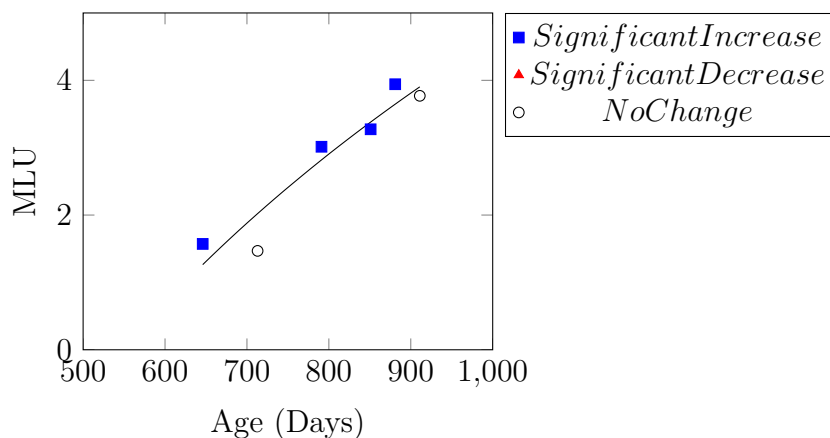


Figure 3.10: Moni MLU

Percentage of pronouns also increases steadily over time. Nominal agreement shows an increase as well, with another spurt happening around 2 years, though not as dramatic as that seen in the other categories. These are reflected in Figure (3.11).

The appearance of features corresponds to what is seen in the other children, with first-person singular being the first to show up. Table (3.13) shows the point at which various feature combinations were first attested on different morphemes. Interestingly, there is no evidence for productive acquisition of these features until after 2 years, after which a wide variety of features appear all at once. Another surprise is that first person plural appears before any other plural morphology, including plural nouns, and second person appears before any third-person features.

In contrast to Miki, Moni tends to use the indefinite agreement first, followed by definite, then pronouns and finally nominal agreement. The indefinite agreement markers represent the fewest amount of features and are seen on intransitive verbs, which is consistent with theory that suggests a more complicated vocabulary item

P, #	Category	1;09.11	1;11.18	2;02.01	2;04.01	2;05.01	2;06.01
1SG	Pronoun						
	V-DEF						
	V- Indef						
	N Agr						
2SG	Pronoun						
	V-DEF						
	V- Indef						
	N Agr						
3SG	Pronoun						
	V-DEF						
	V- Indef						
	N Agr						
1PL	Pronoun						
	V-DEF						
	V- Indef						
	N Agr						
2PL	Pronoun						
	V-DEF						
	V- Indef						
	N Agr						
3PL	Pronoun						
	V-DEF						
	V- Indef						
	N Agr						

Table 3.13: Moni  $\phi$ -feature Acquisition  
 First Use (light) and Partial Paradigm (dark)

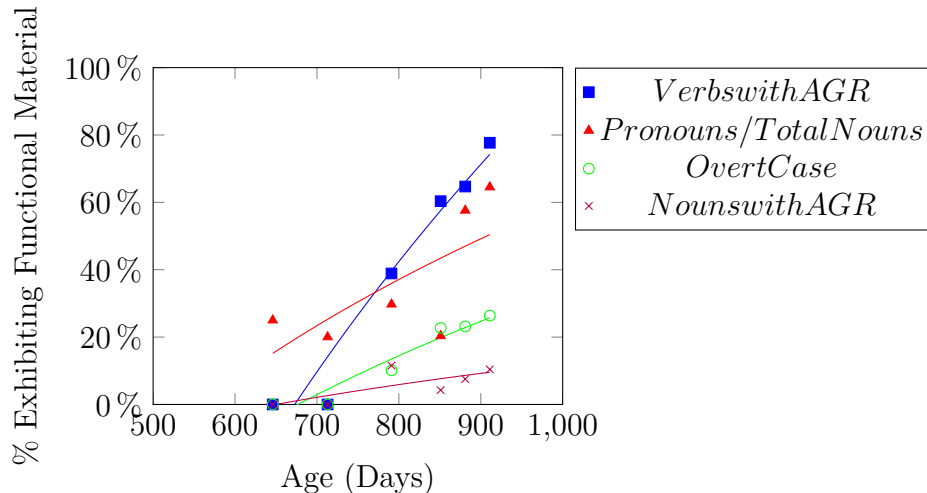


Figure 3.11: Moni Functional Heads Over Time (Percentage)

will be more difficult to acquire. That definite agreement comes second, however, is surprising on this count.

Figure (3.12) provides a clearer example of the state of Moni's grammar at the point where she first uttered relevant morphemes, so the relationship between the morphology and the broader syntactic environment can be appreciated.

From these, we see that, as is often the case for the others, new features appear in below-average MLU utterances. The pronouns and nominal agreement, in fact, often appear by themselves, not in a larger structure.

The case data shown in Table (3.14) is also consistent with what was seen in the other children, though much fewer total forms are attested. Nonetheless, the distinction between the semantic cases and the grammatical cases is strong. Personal pronouns are largely confined to the grammatical cases (though missing accusative),

Age	1;09	1;11	2;01	2;03	2;05	2;07
1SG				<div style="border: 1px solid red; padding: 2px;">én néz-em 1SG see-1SG.DEF <i>I see (it), 2;02.01</i></div> <div style="border: 1px solid orange; padding: 2px;">auto-t szeret-ek car-ACC like-1SG.INDEF <i>I like cars, 2;02.01</i></div> <div style="border: 1px solid red; padding: 2px;">autó-m car-1SG <i>My car, 2;02.01</i></div>		
		<div style="border: 1px solid blue; padding: 2px;">én is 1SG also <i>Me, too., 1;09.11</i></div>				
2SG				<div style="border: 1px solid red; padding: 2px;">lát-od nem fel see-2SG.DEF neg up <i>You don't see it up, 2;02.01</i></div> <div style="border: 1px solid orange; padding: 2px;">nem fél-sz NEG fear-2SG.INDEF <i>You don't fear., 2;02.01</i></div> <div style="border: 1px solid blue; padding: 2px;">nem te NEG 2SG <i>Not you, 2;02.01</i></div>		
3SG				<div style="border: 1px solid red; padding: 2px;">eltép-t-e tear-PAST-3SG.DEF <i>He tore it., 2;04.01</i></div> <div style="border: 1px solid orange; padding: 2px;">halacska uszik-∅ fish swim-3SG.INDEF <i>Fish swim., 2;04.01</i></div> <div style="border: 1px solid blue; padding: 2px;">elvet-t-em tol-e take-PAST-1SG 3SG.ABL <i>You took it from him., 2;06.01</i></div>		
1PL				<div style="border: 1px solid orange; padding: 2px;">én is tegy-ünk 1SG also do-1PL.INDEF <i>We do me, too., 2;02.01</i></div>	<div style="border: 1px solid red; padding: 2px;">betessz-ük a rekámé put.in-1PL.DEF DEF sofa <i>We put in the sofa., 2;05.01</i></div>	
		<div style="border: 1px solid blue; padding: 2px;">mi 1PL.NOM <i>Us, 1;11.18</i></div>				
3PL					<div style="border: 1px solid red; padding: 2px;">homok-ot szor-t-ak sand-ACC sprinkle-PAST-3PL.DEF <i>They sprinkled the sand., 2;05.01</i></div> <div style="border: 1px solid orange; padding: 2px;">jön-nek a bácsi-k come-3PL.INDEF uncle-PL <i>But uncles come., 2;05.01</i></div>	

Figure 3.12: Moni Example Utterances  
2PL were never present in Moni's utterances

with only ablative appearing on pronouns. Lexical nouns appear with a wide variety of cases. Demonstratives are rare, though with both grammatical cases present.

CASE	Name	1;09.11	1;11.18	2;02.01	2;04.01	2;05.01	2;06.01
NOM	Pro				<i>d</i>		
	Nom						
ACC	Pro				<i>d</i>		
	Nom						
DAT	Pro						
	Nom						
ILL	Pro						
	Nom						
INE	Pro						
	Nom						
ELA	Pro						
	Nom						
ABL	Pro						
	Nom						
SUB	Pro						
	Nom						
COM	Pro					<i>d</i>	
	Nom						
DEL	Pro						
	Nom						
SUP	Pro						
	Nom						

Table 3.14: Moni Case Acquisition  
First Appearance (light), Paradigm (dark)

Because very little of Moni's input was included in CHILDES, it's difficult to get a sense of what sorts of patterns may have been present in her caretakers' speech. As such, including percentages of different case forms would be potentially misleading, so raw counts were included instead in Table (3.15). Little can be said, ultimately, though even with the miniscule amount of data, there still appeared accusative pronouns, which were never produced.

	Pronouns	Substantives	Total
Nominative	2	7	9
Accusative	4	0	4
Dative	0	0	0
Semantic	1	1	2

Table 3.15: Moni: Percentage of Cases in Input

The relationship between the growth of subjects and possessors is depicted in Figure (3.13). We see subjects rising steadily throughout. There is no dip in subjects like that seen in the other children, though this may just be because the data ends before adjuncts and other nouns begin appearing. Possessors remain low, as usual, but there is a significant rise throughout.

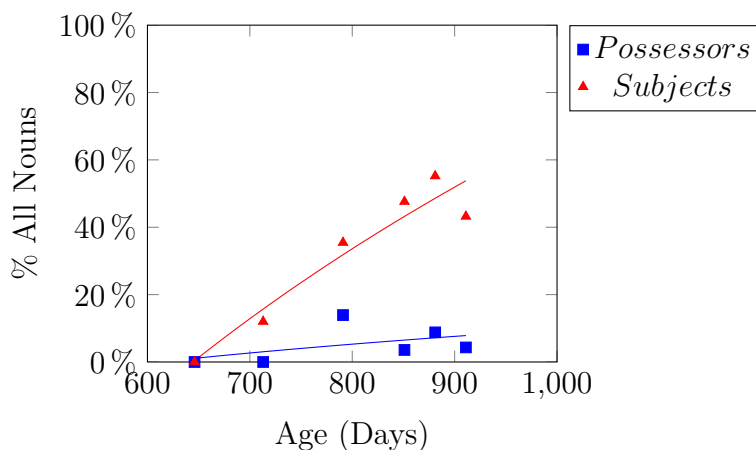


Figure 3.13: Moni Subjects and Possessors Over Time

The steady growth of both possessors and subjects indicates that T and Poss are both represented, providing a structural place to host them. More evidence for this growth can be seen in Table (3.16), which represents the largest syntactic structures produced at the point when the nominal and verbal functional elements are first uttered.



	Largest Nominal Projection	Largest Verbal Projection
<b>1;09.11</b> First N First V	<p style="text-align: center;">autó <i>car</i></p>	<p style="text-align: center;">ké(r) <i>ask</i></p>
<b>2;01.01</b> First Poss, First D First T, First C	<p style="text-align: center;">a kicsi Monikáé <i>Little Monica's (one)</i></p>	<p style="text-align: center;">én nem elrontottam <i>I didn't mess up</i></p>

Table 3.16: Moni Structure Development

These trees show, once again, a very consistent and parallel growth. At the first session, the most complicated nominal projection is simply a noun, and the most complex verb is simply a verb. Two sessions later, all the target categories are present, complete with agreement, providing another piece of evidence for the parallel development of CP and DP in the syntax. The next section will summarize all the data from the Hungarian learners, draw conclusions about the relationship between DP and CP acquisition in Hungarian.

### 3.3 COMPARISON AND SUMMARY

In many respects, the three Hungarian children are similar. Despite the differences in age when the data was collected for each child and what sort of production was recorded, they have similar trajectories. Figure (3.14) plots all the MLUs for the children on the same graph against time. Though Moni has longer utterances at an

earlier date, at no time does there appear to be a large gap between any of them. If one imagines the trajectory for Moni and Miki to continue, as shown in the dashed line in the chart, it would seem that Eva is slightly more advanced than the other two at similar ages, but not so much so that a comparison cannot be drawn. To ensure maximum compatibility of the comparisons, comparisons in this chapter will be made in terms of MLU rather than age.

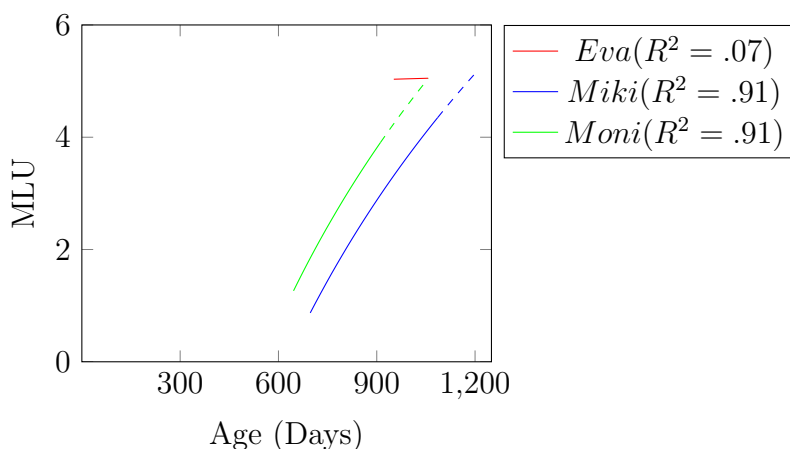


Figure 3.14: Hungarian Children MLU Comparison

Table 3.17 highlights the MLU and order in which the basic syntactic points of the CP and DP were acquired. This table confirms the steady and similar growth of syntactic categories. The children all seem to build structure from the bottom up, with the intermediate projections being produced between when the lowest and highest heads in the respective extended projections appear, as expected.

	N/V		Poss/T		C/D	
	Age	MLU	Age	MLU	Age	MLU
Eva	2;07.12	2.9	2;07.12	2.9	2;07.12	2.9
Miki	1;11.02	.9	1;11.24 (Poss)	1.16	2;01.07	1.43
Miki			1;11.21 (T)	1.11		
Moni	1;09.11	1.6	2;02.01	2.46	2;05.01	3.0

Table 3.17: Summary of Acquisition Points for Parallel Structural Positions:  
Hungarian

The first comparison to be made is how verbal agreement compares across the three children. Figure (3.15) shows the percentage of verbs exhibiting verbal agreement compared across MLUs. The children for whom there is reliable growth information show increasing use of verbal agreement; though Miki uses agreement at nearly twice the level as Moni initially, their rates nearly converge as MLU reaches toward five. Eva, in contrast, shows a significant decrease over this period, a decrease that is paralleled in several other categories, as will be seen soon. This is likely a result of the small sample size over a short period of time; a more detailed examination of morphemes does show a developing grammatical capacity.

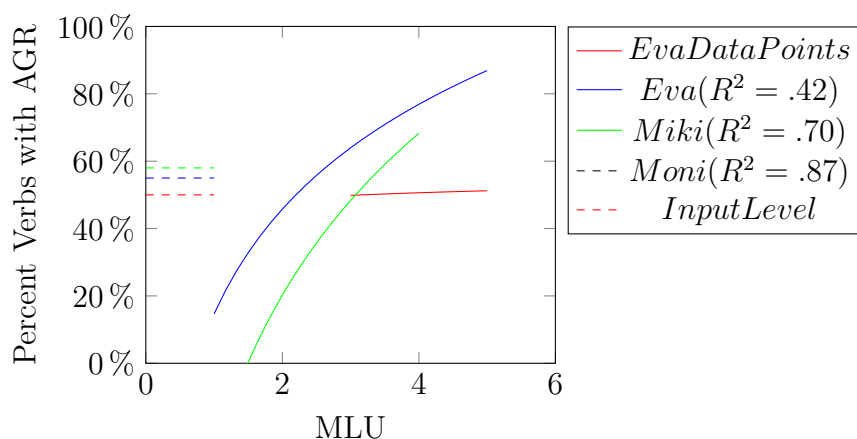


Figure 3.15: Hungarian Children Verbal Agr Comparison

Input agreement levels for the children are all very close to each other, ranging from 50-55%, showing that input is not meaningfully different between them. This graph does show that all the children have a functional agreement system. Eva, who is the oldest of the three during the period of her transcripts, has the most stable percentage of agreeing verbs, hovering right around the adult level. The other two children have verbal agreement rates that climb quickly, going much beyond their input. The discrepancy between Miki and Moni will be seen in other areas as well,

the result of their data showing real growth while Eva's grammar seems altogether more stable.

Eva's lower overall agreement rate is likely the result of more verbs in non-agreeing but nonetheless adult-like forms such as infinitives. Another interesting point can be seen when you compare Eva's agreement rate in terms of MLU from the agreement rate over time (see Figure (3.3)). There, Eva's agreement appears to fall somewhat over time, while it is steady in terms of MLU. Though this would be difficult to explain in terms of grammar, a closer look at her data in terms of age reveals that her second session has a very high verbal agreement rate of 65%; followed by the steady rate in subsequent sessions around 48%, it gives the appearance of a dip when viewed over time.

Having seen some evidence of the functional development in the verbal domain, the same can be studied within nominals. The percentages of pronouns as a percent of all nouns are compared in Figure (3.16). It shows nearly identical paths for all three learners, though Moni's data fit the correlation plotted less well. Each child's data is close to input levels by the end of the sessions. Reflecting the relative maturity of her grammar, Eva shows the least growth, though her production is close to adult-like throughout.

The examples in (14) include the utterances for each child at an MLU of 4 using pronouns. These are all subject pronouns, and they all correctly appear along with their corresponding agreement morphology.

- (14) a. én            is    akar-ok    ide    jön-ni  
           1SG.NOM also want-1SG there come.INF  
           *I want to come there, too.* (Eva, 2;07.12)

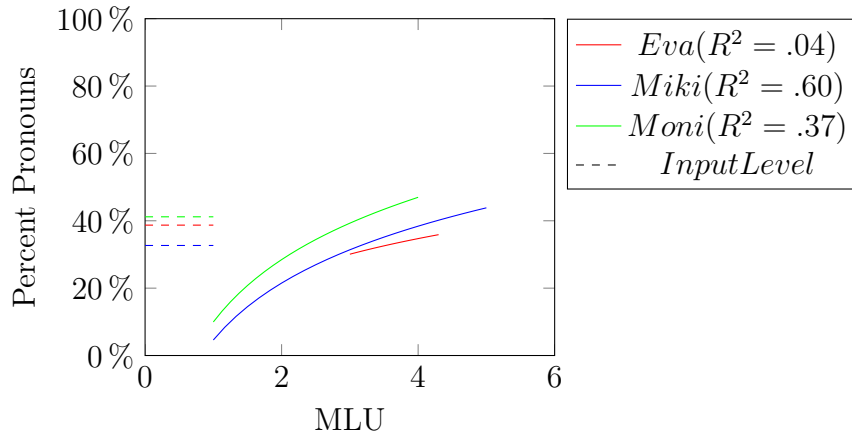


Figure 3.16: Hungarian Children Pronoun Comparison

b. én           nem akar-ok   betakajóz-ni

1SG.NOM NEG want-1SG cover-INF

*I don't want to cover* (Miki, 2;09.03)

c. én           nagy vagyok

1SG.NOM big   be-1SG

*I'm big.* (Moni, 2;05.01)

Having seen the development of pronouns, we can turn to the other evidence used for acquisition of the DP: case. Eva again consistently uses of case across her data range, which makes sense given her high and steady MLU, while both Miki and Moni increasingly make use of overt case, consistent with their individual growth. This development is graphed in Figure (3.17).

This figure and the two before it all show complexity increasing rather steadily in both the verbal and nominal domains for the two children who show growth, and

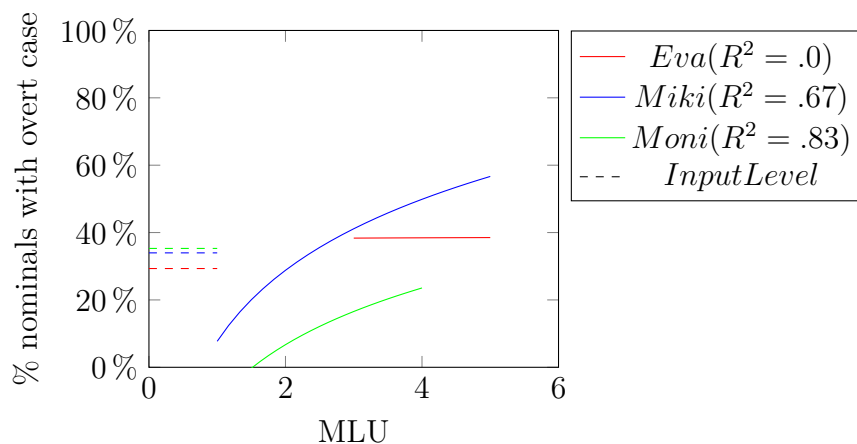


Figure 3.17: Hungarian Children Case Comparison

a steady, more adult-like usage for the mature learner, Eva. The types of case used and the different development paths the children take can show us more about how the functional material is spread between the different syntactic environments. Figure (3.18) shows the MLU the children had when they acquired the various case forms. The dotted lines indicate pronouns, while solid lines indicate case on nominals, with all the semantic cases considered together.

Because Eva had so much morphology in her first session, little can be gleaned here, though it is reassuring at least that all forms do appear as would expected of someone with an advanced MLU. The other two mirror each other fairly well, however. For pronouns, nominative precedes accusative, which precedes dative, with semantic cases showing up late or not at all. This order might reflect the case-assigner acquisition, and T, *v*, and Poss develop in that order. It was shown in the section for each child, however, that Poss and T seem to appear at once. The simplest answer is

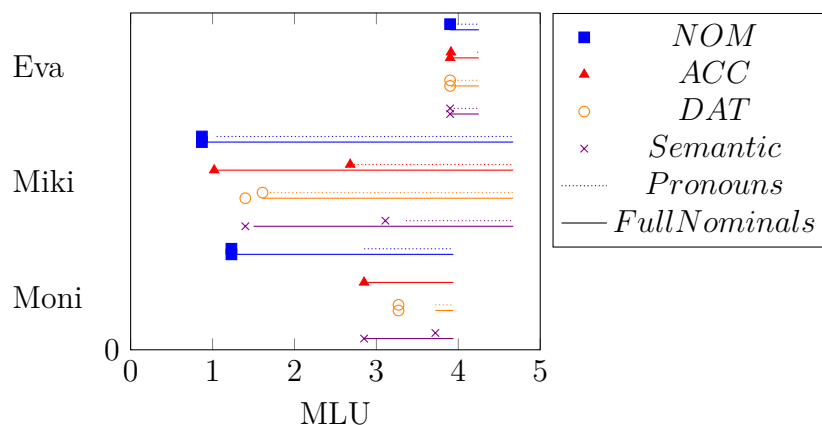


Figure 3.18: Hungarian Case Acquisition Timeline

Symbols indicate first appearance of particular case form; line segments indicate point at which case form was considered *acquired*, which was determined by its appearance on multiple nouns/pronouns.

that this pattern copies frequency in the input, where NOM, ACC, and DAT are the most common case forms for pronouns.

Lexical nouns are similar with regard to grammatical case, though semantic case shows up on them frequently and often early. The difference between case on pronouns and lexical nouns shows that the merge and spell-out of different combinations of functional and lexical items are more or less difficult. The merge of one functional item (a pronoun) with another (a case marker) is more difficult than combining two items with meaningful semantics (lexical items and semantic cases) or one lexical item with grammatical case. One reason for this is the unpredictability: for example, a [3SG] feature may eventually be spelled out as *ő* or *neki*, depending on whether it is combined with [NOM] or [DAT] features. Lexical items (or roots) will be much more stable in their phonological form. This does not explain why semantic case is relatively late on pronouns, despite also involving the spell-out of functional features.

Their late arrival in pronouns might reflect simple differences in the type of nouns that are used as adjuncts or arguments.

The final element of nominal morphology to analyze is the growth of agreement within the DP, graphed in Figure (3.19). Though these are rare constructions, barely hitting 10% for any child, they do all grow over the time period. That they approach 10% but do not exceed it is not surprising given the data for adults, who also produce agreeing nouns at approximately that rate (indicated by the dotted lines on the vertical axis). The steady growth is again clearest for Miki and Moni, though Eva shows the clearest growth here of all the morphology tracked.

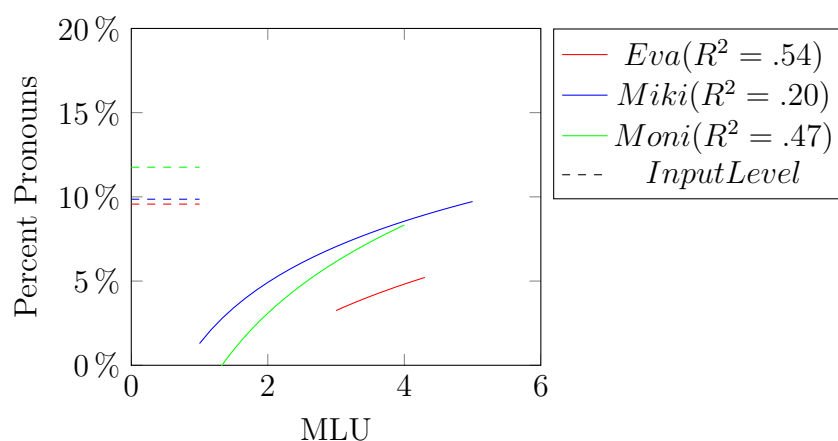


Figure 3.19: Hungarian Children Possessor Agr Comparison

*Note that the scale only goes to 20%, unlike the other graphs, in order to better illustrate the change.*

This figure shows growth of the morphology related to possessors; earlier, growth of verbal agreement was also shown. The individual child sections showed how the syntactic developments related to nouns and verbs paralleled each other. The next aspect to look at is how possessors and subject inclusion changed over time. Figure (3.20) shows two different growth rates. The solid lines indicate the portion of nouns



which are the grammatical subjects, while the dotted lines show the portion of *utterances* which contain subjects.

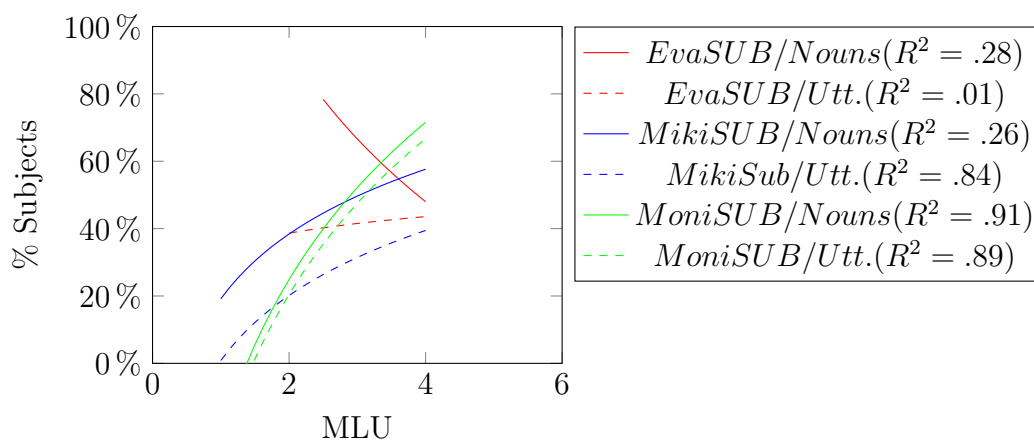


Figure 3.20: Hungarian Children Subject Rate

The reason for including both sets is that as the grammar develops, we expect additional argument and adjunct nominals to appear in utterances. This could explain the downward trajectory of Eva as her MLU increases, though it does not seem to apply to the other children. The dotted lines show increases for Miki and Moni— a very similar increases as well. For this calculation, Eva’s trajectory is mostly flat, suggesting this aspect of her grammar is not changing in the window analyzed.

When we examine possessors, as in Figure (3.21), it is unnecessary to make such a comparison, as there is no expectation that utterances will be more likely to have possessors. Still, the percentage of all nouns that do contain a possessor increases clearly for all the children. Recalling Figure (3.19), which showed the number of nouns exhibiting agreement morphology topping out around 10%, this is very similar to the number of possessors. The only discrepancies should be due to the morphological system not being entirely figured out yet, resulting in possessors that do not trigger the appropriate agreement. Eva also shows dramatic growth here, relative to the other

variables, suggesting this is a part of her grammar that actually is developing during the time period analyzed.

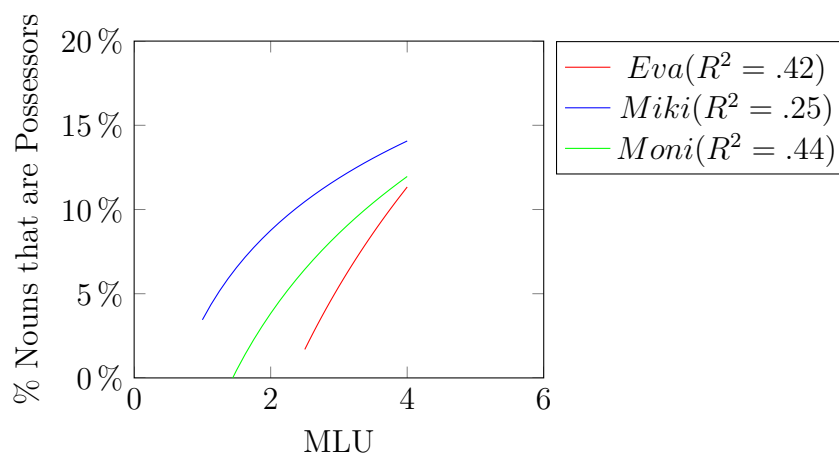


Figure 3.21: Hungarian Possessor Percentage

Evidence from the nominal and verbal morphology, syntax, and semantics has been discussed so far, and has shown that all three children have at least comparable growth rates and that various morphological indicators in the verbal and nominal domains increase over time. The next few analyses will focus more directly on the research questions presented earlier and attempt to show whether the DP/CP similarities are evident in the data.

The next graph examines the relationship between case-marking and agreement in the two domains, following the idea that case and agreement go hand in hand and are associated with the acquisition of the appropriate functional heads. To do this, Figure (3.22) repeats the basic structure of Figure (3.18)– with the very first appearance of a case-form indicated with a shape and the lines indicating the period during which acquisition had been acquired. Unlike the previous figure, only nominative and dative are shown– the cases associated with T and Poss. Between these, the first subject, possessor, verbal agreement, and nominal agreement are shown.

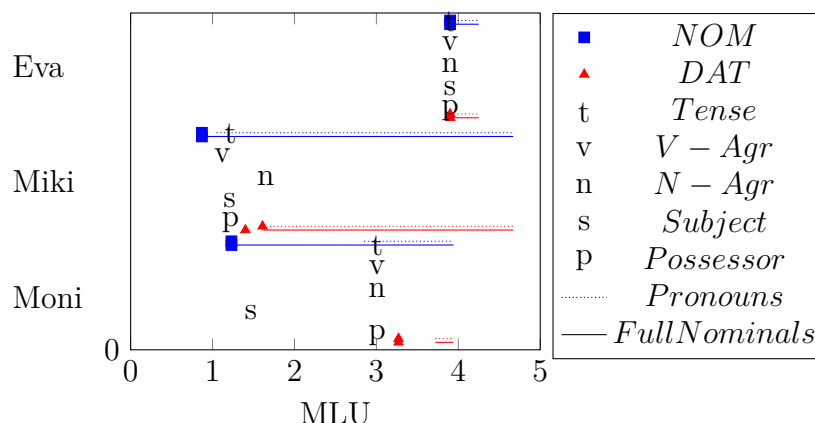


Figure 3.22: Hungarian Case Compared to AGR, PSR, SUBJECT Acquisition

Relationships between the functional heads and the agreement/case associated with them can be seen by the timing similarities between when a feature is manifested and when case-marking occurs. The strongest support for the CP-DP parallel would show a close relationship between the points that NOM/DAT, V-AGR/N-AGR, and Subject/Possessor pairs were acquired. Less strong support would entail relationships between any one of those pairs individually. What is seen is not strong support at all.

It is important to discuss the variation in possessor case marking and how that may affect these results. In Section (3.1), it was shown that possessors may either be nominative, dative, or null, depending on context and the syntax of the particular DP, though it was argued by both Dikken (1999) and Sutton (2014) that all possessors are underlyingly dative. When one looks at the types of possessors seen in early child data, the majority of possessors surface without overt case. This is not surprising, as a feature of early language is the absence of case morphology generally. Once case has been acquired, dative and null possessa begin to be seen, though nominative possessors continue to appear in greater numbers, with approximately half to two-

third of the possessors being nominative, the rest split between null and dative. This is similar to what is seen in the input. Importantly, the first dative possessors appear in the earliest sessions where dative has been acquired, indicating the children do correctly associate this case form with possession, in addition to its other functions.

Keeping this in mind, the comparison can continue. Because Eva's grammar is so advanced at the initial stage, any possible relationships are obscured by the fact that everything has been acquired. With Miki, there is no relationship between features associated with the nominal extended projection– (possessors, dative case, and nominal agreement) and their verbal counterparts. However, nominative case appears quite early, quickly followed by tense, verbal agreement, and the subject, all features associated with the same intermediate head. Likewise, dative case and possessor agreement appear close to one another. This suggests that, rather than a parallel development, Miki is learning all the important elements of T and after this feature bundle is developed, then puts together the elements of Poss.

Moni's data is less revealing, with nearly all morphology coming online at the same session, though well after the first nominative case and well before the first dative possessors. Taken together, this all suggests that, contrary to the expectation, there is not a relationship between when case and agreement are acquired within the verbal domain and when they are acquired within the nominal domain. That said, there are additional ways to look at the data. One such way is to examine how person-number feature combinations occur across their different morphological manifestations.

For Hungarian, there are four meaningful ways these acquisition points can be compared: pronouns to verbal agreement, verbal agreement to nominal agreement, pronouns to nominal agreement, and the nominal agreement to verbal agreement with specific attention paid to the morphological form. These four graphs present the differences by comparing the MLU at the point of acquisition. To take into account

the fact that the children's MLUs are slightly different at the different acquisition points, numbers are presented as percentages

In Figure (3.23), the first time a feature combination appears in the form of a pronoun is compared to the first time it appears as an agreement morpheme. Because verbal agreement always appears before nominal agreement, and pronouns always appear before their nominal agreement counterparts, this graph will indicate whether there is a preference toward interpretable/nominal appearance (indicated by positive numbers) or uninterpretable/verbal appearance (indicated with negative numbers).

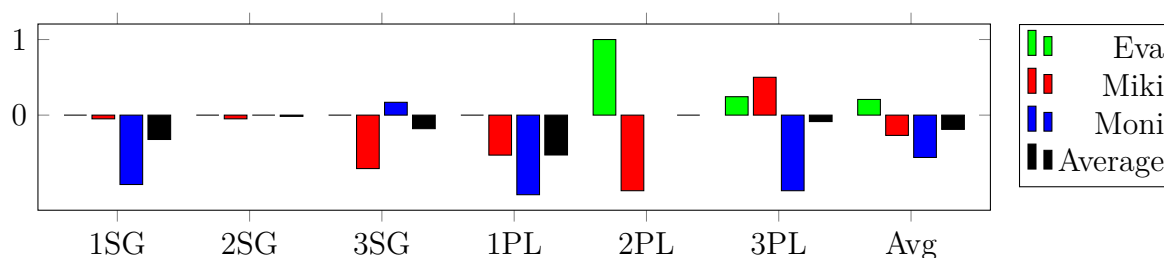


Figure 3.23: Nominal / Verbal Feature Preference

Positive numbers indicate nominal/interpretable pronoun preference;  
 Negative numbers indicate verbal/uninterpretable agreement preference

The figure shows a slight preference for features to appear as agreement prior to appearing as pronouns, though the difference in MLU at the point of acquisition is often less than one. The 2PL features show the widest discrepancy, both between the children and when compared to the other forms. Perhaps importantly, this is also the least common feature combination. In some sense, however, this graph compares apples and oranges— agreement morphemes and pronouns are not the same thing and do not serve the same function, but they do represent the existence of the same underlying features in the grammar. Figure (3.24) shows the same type of data, however this time the features being compared are possessor agreement and subject agreement, with subject agreement preference being indicated with negative numbers.

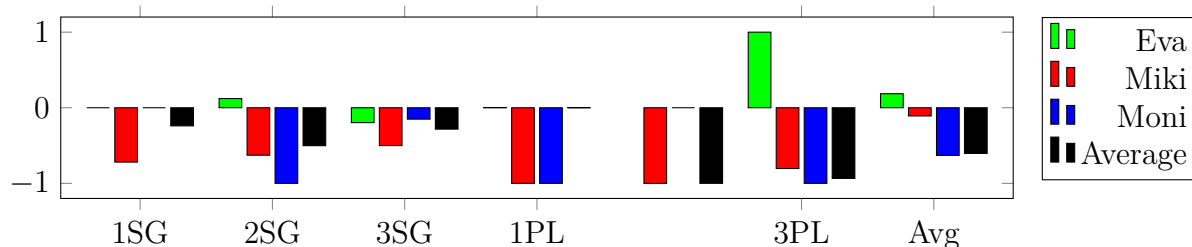


Figure 3.24: Verbal AGR / Nominal AGR Feature Preference  
Positive numbers indicate possessor agreement preference; negative numbers indicate verbal agreement

For this comparison, we see a distinct preference for agreement appearing first on verbs. Eva has the smallest preference and is the only child who uses a nominal agreement morpheme at a lower MLU than the corresponding verbal agreement (2SG). Eva also is the most advanced learner as well—most morphemes appear at the very beginning of data collection. These results are not surprising, given the much higher frequency verbal agreement as compared to nominal agreement—nearly every utterance has an example of verbal agreement, while nominal agreement is only found on approximately 10% of nouns. For the sake of completeness, the difference in MLU at the acquisition point for pronouns and nominal agreement is shown in Figure (3.25). Though this does not shed light on similarities and differences between nominal and verbal development, it is interesting just to compare the same sorts of features within the nominals.

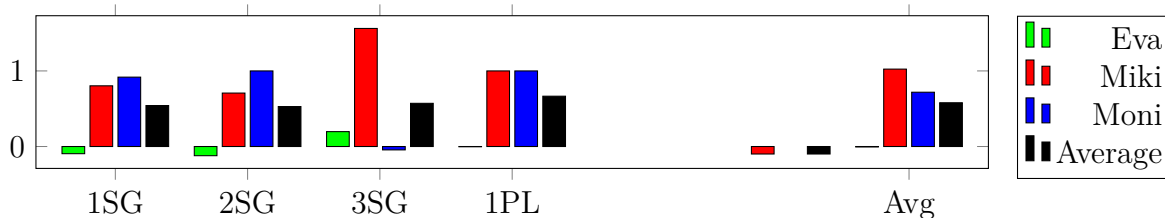


Figure 3.25: Pronouns versus Nominal AGR Feature Preference  
Positive numbers indicate preference for pronouns

This graph shows a strong preference for pronouns before nominal agreement, with only a handful of feature combinations appearing as nominal agreement for any of the children. Taken together, the trend suggests that verbal agreement comes before pronouns, which come before nominal agreement— all of which is in line with frequency.

One final approach to the acquisition of this morphology is to consider the effects of the allomorphic suppletion addressed in Section (3.1). Recall that the possessive singular agreement morphemes were identical to the objective verbal agreement morphemes, the 1PL and 2PL possessive forms were identical to the subjective forms, and, oddly, the possessive 3PL was the same as the objective 1PL. The previous graphs were all undertaken with the assumption that the underlying functional features would be related. A distinct possibility is that the children are simply learning particular morphological forms and using them when appropriate. To discover this, Figure shows the MLU difference at the first utterance of each morpheme. If these numbers are closer to zero, it suggests that the forms are most important, while positive indicates a preference for verbal agreement and negative for possessive agreement.

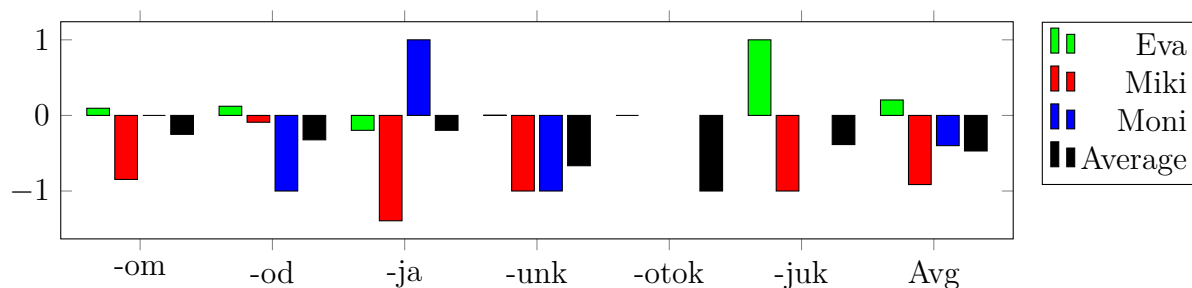


Figure 3.26: Verbal or Nominal Agreement- Suppletive Forms  
Positive numbers indicate preference for verbal agreement; negative numbers indicate nominal preference

As can be seen, there is a general preference for morpheme to show up as verbal agreement much earlier than nominal agreement. This suggests that it is not a matter

of the morpheme being acquired— these are the exact same phonological form— but the underlying features must be acquired. Eva’s data is different— she shows a slight preference for the nominal agreement in 1SG, 2SG, and 3PL forms— the difference is particularly large for 3PL. Two details must be noted. First, Eva’s differences are the smallest overall, with nominal agreement appearing 20% earlier than verbal forms, compared to 40% and 90% for Miki and Moni, respectively. That, combined with Eva’s rather stable MLU over the period, suggests not so much a different direction but that the forms had already been acquired at the onset with Eva. Had the window started earlier, it is likely that a different pattern would arise.

What can be made of this from the point of view of the parallel acquisition approach? This part of the discussion was meant as an answer to the second research question suggested in the first chapter— whether the appearance of a particular feature or structural position in one domain predicts its appearance in another domain. Recall, the closer to zero any of the MLU differences shown in the previous three charts, the more closely aligned the acquisition of the features were. While there is a strong preference for verbal agreement over nominal agreement, and an even stronger preference for pronouns over nominal agreement, Figure (3.23), representing verbal agreement and pronouns, actually shows the closest relationship between the acquisition of the features across domains. Pronouns are learned quickly after their corresponding agreement morphemes. While this is not unassailable data in support of the parallel being relevant for acquisition, if the strongest relationships were DP internal (pronoun acquisition corresponding to nominal agreement), it would certainly suggest a distinct process was at work.

Why this acquisition order should be the case is an open question. One possible explanation involves the nature of spell-out. The first utterances contain vocabulary items that are simply a root and a functional head, which requires no complicated



morphological process. The next items that are produced are roots along with a single, additional functional feature, which are finally followed by items that are purely functional features and, eventually, bundles of functional features.

It was shown for all three children that the syntax in nominals and verbs seems to grow at the same pace. Differences in morphological production follow the steps suggested above. This is also reflected in the types of case morphology shown. Lexical items appear with a wide variety of cases (which mean a single root plus a case feature) before pronouns appear with case (which involves multiple functional features). This suggests an acquisition process where the syntax builds up gradually, but separate morphological word-building processes come online more slowly. This hypothesis will be addressed again in the final chapter, when the acquisition of Hungarian is compared with the acquisition of Estonian and English.

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