The Split-INFL Hypothesis and AgrsP in Universal Grammar

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1. Introduction

Chomsky (1995: Ch.4) proposes an abandonment of the Agr-based theory of clause structure proposed in Chomsky (1991, 1993), and the Split-INFL hypothesis of Pollock (1989) more generally, in favor of a single INFL projection where nominative Case, agreement, and the +EPP feature of T are checked within a single projection, Tense Phrase (TP) as illustrated in (1).

(1)   [TP NP$_i$ T [vP t$_i$ v [VP . . .]]]

Based on his analysis of expletive constructions in English and multiple subject constructions in Icelandic, Chomsky (1995, Ch.4) maintains that agreement phrases (AgrsP and AgroP) may be eliminated from the theory of clause structure and may instead be accounted for by the spec-head relation or, in the terminology of Chomsky (1998), by the relation AGREE. Chomsky (1995: 349) points out that the motivation for Agreement Phrase (AgrP) in Pollock (1989) is largely theory-internal, and that if AgrP is present in clause structure "...it has an even more restricted role and unique status than before, with no apparent impact for the core computational processes" (Chomsky 1995: 377). Consequently, Chomsky concludes that the function of AgrsP (i.e., subject-verb agreement) "could perhaps be accommodated . . .by assimilating it with T," with the added caveat that his analysis only narrows the question of its existence since not all the arguments in its favor have been considered.

In this article I will argue that broader properties associated with subject-verb agreement and AgrsP, such as the conditions under which null and overt subjects are licensed are not adequately explained under the proposals of Chomsky (1995). More specifically, I argue following Speas (1994) that Chomsky's proposal cannot account for Jaeggli and Sapir's (1989) Generalization while also accounting for so-called null expletive constructions in languages like German, and additional constructions in English where there is no overt NP/DP in the canonical subject position.

I maintain, following Speas (1994), that these and additional facts receive a plausible account if AgrsP projects independently in the clause structure in languages like English, French and German as in (2) based on the Principle of Economy of Projection (EOP) which requires that the head or the specifier of a phrase be filled with phonetic or semantic content in order for a phrase to be projected.

(2)   [AgrsP NP$_i$ Agrs [TP [vP t$_i$ v [VP . . .]]]

In support of this view, I review evidence from early child French and German which shows that children acquire the [±Finite] properties of Tense before they acquire grammatical subject-verb agreement and the notion of required grammatical subjects and that these latter properties are acquired in parallel in the development of these respective languages. I show that while these parallel developments are not accounted for within a theory of clause structure which attributes all these properties to a single projection TP, they follow in a principled way from the EOP if we maintain a version of Pollock's (1989) Split-INFL hypothesis where AgrsP may project in the clause structure as in (2) following Speas (1994).

According to Speas (1994), one significant consequence of adopting an analysis based on the EOP is that we may derive the effects of the Extended Projection Principle (formulated as a 'strong' +EPP feature of T in minimalist terms) independently such that it may be eliminated from the theory of grammar. I consider the consequences of this analysis with respect the status of PRO subjects in control and raising constructions in English and show how Speas' analysis provides independent support for Hornstein's (1999) claim that PRO subjects and the theory of control may be eliminated from the theory of grammar and subsumed under trace theory.

2. Problems for Chomsky's (1995) Proposal

One consequence of Chomsky's (1995) proposal is that Tense is now responsible for the syntactic functions previously attributed to a single INFL position (pre-Pollock 1989), with the added difference that languages will vary in the feature strength of the properties of INFL (case, agreement, and the EPP feature of Tense)--strong features must be satisfied by overt movement (at PF) while weak features must be satisfied by covert movement (at LF).

Speas (1994) shows however that a problem emerges for this view when we consider it with respect to Jaeggli and Sapir's (1989) Generalization (9) and additional properties of subject positions in overt subject languages (OSLs) like German and English.

(3)   Jaeggli and Safir's Generalization
           Null subjects occur in the context of either very rich agreement or no agreement at
           all.

If Chomsky's proposal is to be extended to account for this generalization, it is clear that OSLs like English, French and German must have a "strong" +EEP feature in T while null subject languages (NSLs) like Italian and Japanese must have a "weak" -EPP feature in T.

Speas shows that an immediate problem arises with this formulation since it does not explain additional constructions in OSLs like German which contain no overt subject in the specifier of TP. It is uncontrovercial that German is not a *pro*-drop language like Italian since clauses generally require overt subjects as illustrated in (4) in (5).

(4)   a.   Ich bin in der Garten.
                  I am in the garden
           b.   * *pro* bin in der Garten.
                  (I) am in the garden

(5)   a.   Es sind drei Kinder gekommen.
             'There have three children come.'
        b. * Sind drei Kinder gekommen.
             '(There) have three children come.'

However, Speas points out that German also allows so-called null-expletive constructions of the form in (6b).[1]

(6)   a.   Es wurde gestern auf dem Schiff getanzt.
        b.   Gestern wurde auf dem Schiff getanzt.
        c.   *wurde auf dem Schiff getanzt.
             'There was dancing on the ship yesterday.'

If T (or C) in German is specified for a "strong" +EPP feature which requires overt movement of an NP/DP to the surface subject position, it is unclear how we may account for the grammaticality of forms like (6b) under Chomsky's proposal irrespective of whether we take the surface subject position to be spec of TP or spec of CP.

There are a number of other ways in which we might attempt to extend Chomsky's proposal to account for the facts discussed above. One possibility would be to stipulate that Tense in German has an additional head feature which allows null-expletives, a "strong" +NE feature of T. Under this view, languages like German and Italian which allow null expletives would differ from languages like English, which would be specified for a -NE feature in T.

This approach cannot be correct however for two reasons. First, it would fail to predict the ungrammaticality of (5b) and (6c) where no overt expletive is present. If T were specified for an +NE feature which allowed null expletive subjects, we would incorrectly predict null expletive subjects to be possible in these constructions. A second problem with this solution is it would result in a problem of *feature clash* with respect to the +EPP feature of T at PF. While a null expletive subject would be allowed by the +NE feature of T, the +EPP feature of T which requires and overt subject would remain unchecked at PF, and thus the derivation would crash.

A second possibility entails eliminating the binary [± Strong] feature system for agreement (in T), and adopting a continuum of agreement feature "strength" where agreement in German would be "stronger" than in English such that it may license and identify null expletives but would be "weaker" than in Italian such that they would not license and identify *pro* subjects more generally.

Irrespective of the potential complications this would pose for the theory of grammar in general, this alternative also fails to avoid the problem of *feature clash*. No matter how the "licensing" and "identification" properties of agreement are formulated, the strong +EPP feature of T would not be satisfied in constructions with null expletive subjects. We might attempt to solve the problem by assuming that the relatively "stronger" properties of agreement could "weaken" the +EPP of T to allow a null expletive subject without causing the derivation to crash at PF. But this solution would likewise be unable to account for the ungrammaticality of (5b) and (6c) where a null expletive subject is ungrammatical.

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[1] Yiddish also allows similar constructions, see Speas (1994) and Vinker (1995) for discussion.

Similar problems arise in the case of English. Consider the case of locative inversion.

(7)   a.   The ball rolled down the hill.
        b.   Down the hill rolled the ball.

As illustrated in the alternation in (7), an NP/DP need not occur in the surface subject position as long as a locative PP occupies this position. The grammaticality of forms like (7b) does not immediately follow from Chomsky's proposal. If the +EPP feature of Tense in English is "strong" as Chomsky suggests, then it is unclear why the NP/DP *the ball* does not move obligatorily to the surface subject position but remains instead in a postverbal position.

Additional problems arise with subordinate clauses in relation to the *That*-Trace effect. As illustrated in (8), subordinate clauses in English headed by the complementizer *that* generally do not allow and empty or null subjects in the canonical subject position.

(8)   a.   I believe that he said [CP that [TP he lied under oath]]
        b.   *I believe that he said [CP that [TP lied under oath]]

While the facts in (8) may be explained under Chomsky's proposal, Culicover (1993) shows that there are in fact similar constructions where a PP or adverbial may substitute for an NP/DP in the canonical subject position as illustrated in (9).

(9)   a.   Robin met the man that Leslie said [CP that [TP *(for all intents and purposes)
             was the mayor of the city]]
        b.   This is the tree that I said [CP that [TP *(just yesterday) had resisted fire]]
        c.   I asked what Leslie said [CP that [TP *(in her opinion) had made Tim quit]]

The grammaticality of these forms is clearly not accounted for under Chomsky's proposal (at least in the strictest sense). If T in English has a "strong" +EPP feature as Chomsky suggests, we would expect the subordinate clauses in (9) to contain overt NP/DP subjects.[2]

It is difficult to see any grounds on which the "licensing" and "identification" properties of agreement in English could be modified to account for the facts in (7)-(9) while also account for the general property that clauses have overt subjects since English has less agreement morphology than German. Furthermore, any attempt to do so would be dubious since, as we have seen, doing so will not allow us to account for the German facts discussed above nor can it avoid the problem of feature clash (at least in a theory where subject properties are located in a single TP projection).

In the rest of this article I will argue for an alternative and far simpler solution, which is to maintain a version of Pollock's (1989) Split INFL hypothesis where AgrsP projects independently in the syntax following Chomsky (1991, 1993). More specifically, I will maintain that if we adopt the theory of agreement and the Principle of Economy of Projection proposed in Speas (1994), we may account for the properties of NSLs and OSLs and allow for a plausible theory which may allow for an account of these problematic facts.
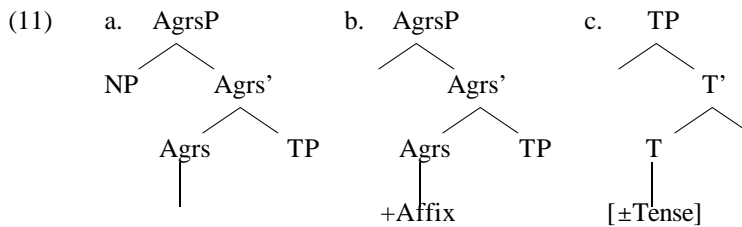
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[2] Culicover (1993) shows that these facts also cannot be explained by the ECP.

3. AgrsP and the Principle of Economy of Projection

Speas (1994) derives Jaeggli and Sapir's Generalization based on the Principle of Economy of Projection (EOP) in (10) and a parametric option in the relaization of agreement morphology.

(10)   Principle of Economy of Projection (EOP)
          Project XP only if its head X or its specifier [Spec, XP] has independent semantic or phonetic content.

This account is based on a three-way distinction in subject-verb agreement properties. Under this view, the difference between OSLs like English, French and German with "mixed" agreement morphology and NSLs like Italian with "rich" agreement morphology is that only the latter have the parametric option of allowing agreement morphemes to head their own projections as in (11b) (which then combine with the verb in the overt syntax).

(11)   a.   AgrsP   b.   AgrsP   c.   TP

           NP   Agrs'   Agrs'   T'

              Agrs   TP   Agrs   TP   T

                                  +Affix   [±Tense]

Since Agrs contains an agreement morpheme in NSLs like Italian, AgrsP may be projected in accordance with the EOP and allow null subjects. OSLs, on the other hand, do not have this parametric option and may only realize agreement morphology directly on the verb as in (11a) such that the verb does not move overtly to Agrs to project AgrsP. Since verbs do not move overtly to project AgrsP, a subject must raise to the specifier of AgrsP to project the phrase; otherwise, the agreement features of the verb cannot raise and be checked at LF, and the derivation crashes. In languages like Japanese and Chinese, which have no agreement morphology, no AgrsP is projected. Instead, clauses will be headed by Tense which has independent semantic content, thus allowing for the possibility of null subjects in these languages. In this way, Speas derives not only Jaeggli and Sapir's Generalization from a parametric option in the realization of agreement morphology and the EOP, but also the empirical effects of the EPP.

We have seen that Chomsky's (1995) proposal fails to account for both the general properties of OSLs with respect to (3) and the additional facts concerning null expletive constructions in German, and locative inversion and suspension of the *That*-Trace effect in English. Now consider how these facts may be plausibly subsumed under Speas' proposals in a theory which maintains the Split-INFL hypothesis where AgrsP projects in the clause structure.

Notice crucially that null expletives occur in German only when an adverbial (e.g., *Gestern*) occupies the cannonical subject position as in (6b). Speas (1994) argues that this property follows immediately from the EOP if the adverbial is merged as a specifier of AgrsP as in (12). Since the specifier of AgrsP has phonetic content, the phrase may be projected without requiring movement of an overt lexical subject. As a result, since AgrsP is projected, subject-verb agreement may be checked at a later point in the derivation (presumably at LF) and thus the derivation converges.

(12)   [AgrsP Gestern Agr [TP wurde auf dem Schiff getanzt]]

This explains why German does not allow null subjects as in (4b) or null expletives in cases like (4b) and (6c). If the specifier of AgrsP is not filled overtly, AgrsP cannot be projected and the subject-verb agreement properties of the verb cannot be checked at LF, resulting in a non-convergent derivation.

This analysis may be plausibly extended to cases of locative inversion and the suspension of the *That*-Trace effect in English (note that additional restrictions would be required to account for the limited extent to which these may be used in English). In the case of locative inversion, (6b) involves merger of the adverbial *down the hill* to the specifier of AgrsP as in (13); otherwise, the NP/DP must raise to this position as in (6a).

(13)   [AgrsP Down the hill Agr [TP rolled the ball]]

This likewise accounts for the ungrammaticality of forms with no overt element in the canonical subject position as in (14).

(14)   *[AgrsP e Agr [TP rolled the ball down the hill]]

Since the specifier of AgrsP is unfilled, and since main verbs in English do not raise to Agrs, AgrsP cannot be projected in accordance with the EOP. As a result, agreement feature checking cannot take place at LF, so the derivation crashes. The same analysis may also allow for an account of the suspension of the *That*-Trace effect illustrated in (9).

We have seen that Chomsky's proposal that AgrsP may be eliminated and subsumed by the spec-head relation (within TP) cannot account for both Jaeggli and Sapir's Generalization and additional facts where no overt subject appears in the cannonical subject position in German and English, and that both receive a plausible account under the proposals of Speas (1994) if we maintain a version of the Split-INFL hypothesis where AgrsP may project independently in the syntax. In the following section, I will provide independent evidence in support of this view from early child German and French which shows that AgrsP projects independently of TP.

4. The Acquisition of Tense and Agreement

Current acquisition research shows that even before age 2, children learning German and French make a clear distinction in the position of finite and non-finite verbs with respect to the position of subjects and negation elements. In the case of early child German, data from Poeppel and Wexler (1993) (Table 1) show that finite verbs tend to occur in first or second position while non-finite verbs tend to occur in final position, this is known as the [±Finite] verb distinction. Numerous other studies report similar findings (e.g., Weissenborn 1992, Verrips and Weissenborn 1992, Clahsen et al. 1994, Meisel 1994). Data from Pierce (1992) (Table 2) shows that children learning French also make a similar distinction in the position of finite and non-finite verbs with respect to negation, finite verbs tend to precede the negation element *pas* while non-finite verbs tend to follow *pas*. Déprez and Pierce (1993) furthermore shows that these generalizations with respect to subjects and negation elements hold for both early child German and French. The fact that children learning German and French make a distinction in the position of finite and non-finite verbs based on the [±Finite] properties of main verbs and negations elements shows that Tense is

present in the early stages of syntactic development before age 2 (also see Meisel and Müller 1992, Griffin, 2000a,b).

	Finite	Non-finite
1st/2nd position	216	7
Final position	15	44

TABLE 1. The [±Finite] verb distinction in German (Poeppel and Wexler 1993)

	Finite	Non-finite
NEG Verb	11	77
Verb NEG	185	2

TABLE 2. The [±Finite] verb distinction in French (Pierce 1992)

Interestingly, additional acquisition research shows not only that grammatical subject-verb agreement is acquired later with respect to the [±Finite] verb distinction, but that its emergence parallels the emergence of the notion of grammatical or required overt subjects (for related discussion see Clahsen 1986, Weissenborn 1992, Clahsen and Penke 1992, Pierce 1992, and Griffin 2000a,b). This is illustrated (in part) by the increase in the use of overt subjects versus missing or null subjects between the ages of 2 and 3 in early child German and French in Tables 3 and 4 (from Weissenborn 1992).

Age Range	% Overt Subjects
1; 10; 20-28	18.4
1; 11; 13-23	17.4
2; 1; 12-22	44.1
2; 2; 03-21	60.6
2; 4; 17-21	85.9
2; 8; 09-15	76.6

TABLE 3. Percentage of overt subjects in matrix declarative clauses (German)

Age Range	% Overt Subjects
2; 1; 19-26	69.7
2; 2; 03-26	63.5
2; 3; 00-21	70.3
2; 6; 13-27	91.2
2; 7; 11-25	87.1
2; 8; 01-29	95.7
2; 9; 15	93.7

TABLE 4. Percentage of overt subjects in matrix declarative clauses (French)

Verrips and Weissenborn (1992) provides additional evidence for the view that finiteness and adult-like verb movement are available to children learning languages like German and French independently of their knowledge of subject-verb agreement, which is presumably dependent on the

acquisition of a separate Agreement Phrase. Numerous other researchers arrive at similar findings for early child German and French (e.g., Meisel and Müller 1992, Gawlitzek-Maiwald et al. 1992, Clahsen and Penke 1992, Penner 1992, Griffin 2000a,b).

The general conclusions drawn in the acquisition literature are as follows. In the case of children learning German, the [±Finite] properties of Tense are present even before age 2 while grammatical subject-verb agreement and the notion of grammatical or overt (required) subject are gradually acquired between the age of 2 and 3. In the case of children learning French, the [±Finite] properties of Tense are present before age 2 while the notion of grammatical or overt (required) subject are not acquired until around age 2;6.[3] Other research shows that the relation between grammatical subject-verb agreement and the notion of required grammatical subject also holds for early child English (see Roper and Rohrbacher 1994).

The difference in the acquisition of Tense relative to the acquisition of subject-verb agreement and grammatical subjects does not immediately follow under Chomsky's proposal where AgrsP is eliminated from the theory of clause structure as in (1) and subsumed by the spec-head relation (within TP). Instead, such a view would incorrectly predict that *all of these properties should develop in parallel*, since they would be related to the development of a single head (T). In contrast, we may account for these differences in a principled way based on Speas' proposals if TP is immediately dominated by a maximal projection AgrsP and if children acquire or set the parameters for projecting the more basic phrase TP before the more complex phrase AgrsP. Such a view would correctly predict the correlation between the increased use of overt subjects and the increased use of subject-verb agreement in OSLs. As subject-verb agreement is gradually acquired, the EOP will increasingly require movement of an overt subject to the specifier of AgrsP so that agreement features may be checked at LF.

The findings of acquisition studies provide independent evidence for an AgrsP projection which is separate from Tense. In addition, the fact that subject-verb agreement and required grammatical subjects are acquired in parallel provides strong support for the proposals of Speas (1994) which maintains that these properties are derived from the EOP and the theory of agreement and for maintaining a version of the Split-INFL hypothesis as in (2).

5. Eliminating the EPP and the Theory of PRO Subjects and Control

One consequence of adopting an analysis of subject positions based on the EOP is that we may independently derive the effects of the EPP, allowing for a significant reduction and simplification of the theory of grammar while allowing us to maintain a theory of grammar with greater explanatory adequacy. This alone provides adequate empirical and theoretical motivation for adopting Speas' (1994) proposal over the proposals of Chomsky (1995) discussed above. There are additional reasons as well.

One additional and rather important consequence of adopting Speas' (1994) approach is that it may allow us to eliminate the theory of PRO subjects and the theory of control (Chomsky 1981)

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[3] The data from Weissenborn (1992) shows that children learning French do make greater use of overt subjects than children learning German in age comparable groups. See Griffin (2000a,b) for an account for this phenomena (an account which is compatible with the arguments and proposals presented here thus far).

following the proposals of Hornstein (1999). Consider the following examples illustrating both obligatory control in (15) and non-obligatory control in (16) and typical raising constructions as in (17) under standard analyses based on the EPP.

(15) a. John$_i$ expects [PRO$_i$ to [t$_i$ win the race]]
        b. I$_i$ want [PRO$_i$ to [t$_i$ leave immediately]]

(16) a. John$_i$ thinks [that [PRO$_i$ shaving himself] is important]
        b. John$_i$ told them$_j$ [that [PRO$_{i+j}$ wining the race] would not be easy]

(17) a. I believe him$_i$ [t$_i$ to [t$_i$ be an honest man]]
        b. He$_i$ seems [t$_i$ to have [t$_i$ been an honest man]]

As pointed out by Hornstein (1999), the theory of PRO subjects and the theory of control pose numerous complications for the theory of grammar including case theory since T presumably checks or assigns a "null" case to PRO subjects (see Chomsky and Lasnik 1993) and requires an expanded inventory of empty categories (i.e., PRO, pro, t) among others.

Hornstein (1999) shows that the properties of PRO subjects and the theory of control more generally may be subsumed by trace theory (for further discussion see Hornstein 1999). The point I wish to make here is that motivation for postulating and maintaining the existence of PRO subjects and the theory of control is largely theory-internal to a particular theory of grammar, one which assumes some version of the EPP (see Chomsky and Lasnik 1993). If however we adopt an approach following Speas (1994) where the EPP may be derived independently from the theory of agreement and the EOP, the fact that subordinate non-finite clauses in constructions like (15)-(17) do not require overt lexical subjects may be accounted for independently by the fact that there is no subject-verb agreement in non-finite clauses and AgrsP is simply not projected in these clauses.

A comparison of the cases in (15)-(17) with their counterparts in (18)-(20) shows that the raised subject does not need to agree with the non-finite verb in the subordinate clauses, but only with the matrix finite verb (when raised to subject position).

(18) a. [AgrsP The boys$_i$ expect [TP to [t$_i$ win the race]]]
        b. [AgrsP He$_i$ wants [TP to [t$_i$ leave immediately]]]

(19) [AgrsP The guys$_i$ think [that [TP/VP t$_i$ shaving themselves] is important]

(20) [AgrsP Some presidents$_i$ seem [TP to have [t$_i$ been honest men]]

Thus, adopting an analysis based on the EOP is entirely consistent with the proposals of Hornstein (1999), with the added advantage that we do not need to claim that subjects in English move through the specifier of TP. Since TP in non-finite clauses has independent phonetic content (headed by *to*), subjects may raise directly from a VP-internal position to a matrix clause position.[4] Under this view, English infinitive clauses bare a similarity to finite clauses in

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[4] Bobaljik and Jonas (1996) provide independent evidence for the view that subjects do not move into the specifier of TP in English based on the absence of Transitive Expletive Constructions.

languages like Chinese and Japanese in that they do not project AgrsP and thus do not require an overt subject.

Andreas 2;1	*finite Aux*	*infin. Aux*	*finite V*	*infin. V*
overt subject	85	0	117	22
null subject	6	1	13	45

TABLE 5. Finiteness and Overt Subjects in German (Krämer 1993)

	prevb-subj./inf. [a]		*prevb-subj./fin.*	
	n	*%*	*n*	*%*
Nathalie 1;9–2;3	49/295	17%	209/304	69%
Philippe 2;1–2;6	11/194	6%	523/782	67%
Daniel 1;8–1;11	11/205	5%	96/273	35%

TABLE 6. Finiteness and Preverbal Overt Subjects in French (Phillips 1995)

Additional acquisition data on the use of overt and null subjects in finite and non-finite clauses provides some independent support for this view. Krämer (1993) and Phillips (1995) find that overt subjects occur with significantly greater frequency with finite verbs versus non-finite verbs in early child German and French. If we adopt Speas' proposals, we would correctly predict that AgrsP projects only in those constructions where agreement features are present, finite clauses. Since non-finite clauses lack agreement but are instead headed by non-finite T which has both semantic and phonetic content (infinitive marker *to*), we also correctly predict the difference in the use of overt and null or missing subjects in finite and non-finite clauses in early child language.

8.   Conclusions

I have argued that Chomsky's (1995) claim that the properties associated with AgrsP may be subsumed by the spec-head relation where AgrsP may be eliminated from the theory of grammar cannot account for the more general properties of subject positions in overt subject languages like English and German. Adopting an analysis following Speas (1994) which maintains a version of the Split-INFL hypothesis where AgrsP may project independently in the syntax will not only allow for an account of constructions which are clearly problematic for an account based on the EPP, but will also allow us derive the empirical effects of the EPP from the theory of agreement and Principle of Economy of Projection. Adopting Speas' proposals also have the added advantage of allowing for additional simplifications in the theory of grammar following Hornstein (1999) since AgrsP does not project in non-finite clauses, but only in finite clauses. In addition, we have seen that acquisition data provide independent evidence for the existence of an independent AgrsP immediately dominating TP in finite clauses and for the absence of AgrsP in infinitive constructions. If the goal of linguistic theory is to provide an explanatory account of the properties of subject position, not only in adult language but also in child language, it is clear that an account following Speas (1994) provides a more explanatorily adequate account of these

properties than the proposals of Chomsky (1995). Since Speas' proposal allows us to account for a broader range of the properties of subject positions while independently deriving the effects of the EPP, it is clearly preferable to Chomsky's proposal on both empirical and conceptual grounds.

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