Children in Search of Perfection: Towards a Minimalist Model of Acquisition[1]

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1. In a characteristically entertaining after-dinner speech presented to the Spring 1994 meeting of the *Child Language Seminar*, David Crystal made the (tongue-in-cheek) remark that existing child language research was fundamentally flawed in that it assumed that children are *perfect*, and thus failed to recognise that children are in fact *imperfect* (smelly, dirty, noisy) creatures who make many 'mistakes' in the course of their development. This paper sets out to restore the tarnished reputation of children by arguing that they are *perfect language learners* (in the sense that they are perfectionists who seek perfection in the imperfect input they receive).

2. The revised model of *Minimalism* presented in Chomsky (1998, 1999) raises interesting questions about the nature of language acquisition. If the Language Faculty specifies a universal set of features (Chomsky 1999, p.7), a child acquiring language L has to learn which subset of these features are assembled into lexical items in L, and how[2]. If innate architectural principles determine how lexical items project into syntactic structures, the major task facing the child in acquiring the syntax of a language is assembling features into lexical items. There is some evidence to suggest that lexical feature-assembly is an incremental process whereby children build up lexical entries feature by feature. For example, it is not uncommon for children initially to use the pronoun *he* to refer to males and females alike; e.g. Eve at 2;0 (file 13 in the Brown files on CHILDES) says *For he lunch* referring to her father and *He shut his eyes* in relation to her doll. This suggests that her lexical entry for *he/his* incorporates (third) person and (singular) number features, but lacks the (masculine) gender feature associated with the corresponding adult entry.

3. If language acquisition involves *incremental feature-building*, it follows that some features will be acquired before others. This in turn raises the question: 'In what order are features acquired and why? Is there a maturational schedule which makes different types of features available to the child at different stages of development?' One possibility along these lines is that cognitive maturation guides the course of acquisition, and that children (at a given stage) will not acquire features encoding properties which their immature cognitive development makes them unable to construct mental representations of. For example, we might hypothesise that Person is cognitively more complex than Number, since Person is a relational property which involves locating entities in space relative to speaker and addressee whereas Number is a non-relational property[3]. If so, we might expect Number to be acquired before Person. There would seem to be some evidence that this is so. For example, if we look at the speech output of Allison (in the Bloom files on CHILDES) at ages 1;8 and 1;10, we find evidence that she has acquired Number, since she uses regular plurals like *cookies/toys* and irregulars like *children*. However, there is no evidence that she has acquired Person, since she used names (and other nouns) for both self-reference and addressee-reference[4] (saying e.g. *Wiping baby chin* where an adult would say 'I'm wiping *my* chin' and *Eating Mommy cookie* where an adult would say 'I'm eating *your* cookie'). Moreover, she never uses a determiner with any of the 357 noun expressions[5] she produces, even though she uses other kinds of noun modifier (e.g. in *green cup*, *tiny cow*, *more juice*, *baby diaper, daddy cow*, *pony dress*); if determiners are the locus of person (as argued by Abney 1987), the fact that she says *Man drive truck* rather than *The man drives the truck* (where the third-person determiner *the* marks the person properties of the nominal) provides further support for the conclusion that she has not yet acquired the person properties of noun expressions (by virtue of not having acquired the D-system which encodes these in adult English)[6].

4. A further possibility (explored in this paper) is that innate architectural principles determine the nature of children's initial grammars. Chomsky (1998, 1999) argues that language is a (near-) perfect system in which only what is conceptually necessary is projected in the syntax, and that good design principles require grammars which *maximise perfection* and *minimise imperfection*. Now, suppose that an innate *Grammar Construction Algorithm/GCA* leads the child constructing an initial grammar G1 of language L to make the idealistic assumption that L is a perfect language: it follows that G1 will be a perfect grammar which incorporates only what is conceptually necessary and excludes imperfections – i.e. 'mechanisms that would not be found in a "more perfect" system satisfying just legibility conditions' (Chomsky, 1999 p.1); imperfections would then be acquired at a later stage of development, perhaps in an incremental fashion. Such a **perfection model** predicts that the initial syntactic structures produced by children will be perfect structures that contain no imperfections[7]. So, if irregular verbs are a morphological imperfection (because of the learning burden they impose), we should expect that (once children have acquired regular verb inflections) they will produced over-regularised[8] forms of irregular verbs (e.g. saying *goed* rather then *went*). Likewise, if morphological non-uniformity[9] is an imperfection, we might expect

that children who learn that past tense (regular) verbs carry the overt inflection +*d* but that present tense verbs carry a null inflection in most forms may extend the null inflection to use with third person singular subjects (as in *He like chocolate*), thereby maximising morphological uniformity[10]. More importantly (in the context of the present paper), if uninterpretable features[11] are an imperfection (and have to be erased by the operation *Agree* in order to ensure LF-convergence)[12], good design principles will require that uninterpretable features be projected *only when necessary*[13]. If the innate GCA leads the child to develop an initial grammar which maximises perfection and minimises imperfection, we might expect initial grammars not to license purely uninterpretable elements like expletives[14].

5. The assumption that children's initial syntactic structures are projections of interpretable features does not of course entail that the relevant structures will contain *all* the interpretable formal features found in the corresponding adult structures. Consider, for example *force* features.

If we follow Chomsky (1999) in positing that propositions require a specification of force, and if we further suppose that C is the canonical locus of force features, it might seem that children's initial clauses must be CPs headed by an abstract force-encoding C. However, there are several caveats which need to be voiced here. For example, if children at an early stage don't have the representational resources for projecting *force* in the syntax, there will be no CP projection in their initial grammars. Moreover, the argument for clauses universally containing a force-specified CP is potentially problematic for complement clauses. For one thing, Boškovic 1997 argues that the complement of *think* in sentences like *Who do you think's telling the truth* cannot be a CP (and must instead be a TP) since the presence of a null complementiser between *think* and *is* would prevent *is* from cliticising onto *think*. Moreover, Chomsky himself maintains (1999, p.6) that there are a class of *defective* complement clauses (e.g. in raising/ECM structures) which are TPs lacking a superordinate CP projection. Such defective clauses seem to have their own force properties, so that (e.g.) in *Do you believe him to be innocent* the matrix clause is interrogative in force and the infinitive clause has essentially the same declarative force as the *that*-clause in *Do you believe that he is innocent?* It would seem that the force of the defective complement clause is determined by semantic properties of the matrix predicate, in that (e.g.) *believe* selects a declarative complement and *enquire* an interrogative complement. If the force of a complement clause ß is determined by semantic properties of the selecting predicate α, there is no reason to assume that complement clauses (in either adult or child English) must be CPs in order to encode force.

6. Still, it might be argued that *root clauses* must nevertheless be CPs headed by a force-encoding C, since in such cases there is no superordinate predicate selecting the clause as its complement and assigning it force. But this assumption in turn is problematic in at least three respects. Firstly,

Rizzi (1994) argues that root clauses with truncated subjects like *Can't find it* are CP-less TPs whose null constant subject occupies specifier position within TP. Secondly, Grimshaw (1997) maintains that echo questions like *You've forgotten something/*anything?* are TPs which (by virtue of lacking CP and hence lacking an interrogative operator in spec-CP) do not license polarity items like *anything*. Thirdly, root expressions can encode force as a suprasegmental feature (e.g. with rising intonation signalling interrogative force), irrespective of their syntactic status. For example, even a single-word sentence fragment like *Whisky?* (with rising intonation) is interpreted as having much the same interrogative force as a question like 'Would you like some whisky?' If any root expression α can encode force suprasegmentally (irrespective of whether α is an N like *Whisky?*, a QP like *Two sugars?*, a PP like *On the table?*, etc.), there is no reason to posit that children's root clauses must be CPs in order to encode force. And indeed a look at the earliest questions produced by young children offers no apparent evidence of the projection of a CP node: e.g. the earliest interrogatives produced by Eve (in the Brown corpus on CHILDES) included *Down?*, *Turn?*, *More juice?*, *Cow down? That Mommy eggnog?*, *Neil sit that?* etc[15].

7. We might arrive at similar conclusions in relation to Tense. Chomsky (1999) posits that propositions require a specification of tense/event structure: this might seem to imply that innate architectural principles require that all clauses (including children's initial clauses) contain a TP headed by a T carrying tense features. But once again, caveats have to be entered. For example, it is possible that very young children might not have the representational resources for projecting tense in their initial syntactic structures[16]. Moreover, the assumption that propositions *must* contain a formal tense feature seems questionable, since there are adult languages which have no tense morphology. One such is Yoruba, in relation to which Rowlands (1969, p.18) notes that 'The Yoruba verb does not contain any built-in distinction between past and present' and that 'It is the situation in which a phrase is used or some accompanying word which fixes time as present or past' (ibid, p.9): in other words, time reference is contextually determined either in relation to the immediate linguistic context (if this contains temporal expressions corresponding to English *yesterday/tomorrow* etc.) or in relation to the discourse context. It would therefore seem that innate architectural principles do not *require* the syntactic

projection of tense; and this being so, there would be no violation of such principles if there were no formal tense feature projected in early child grammars. So, when at age 1;8 Hayley replies *Hayley draw boat* to the question 'What did you draw?', it may either be that she is unable to conceptualise the complex temporal relations encoded by Tense at this point, or that her GCA leads her to posit that redundant tense information which has already been given by the previous speaker should not be projected in the syntax. In other words, she may initially treat English as being like Yoruba in the relevant respect, and will only later come to learn that one of the tedious imperfections of English is that it requires tense to be overtly marked in root clauses even where it can be inferred from the linguistic or nonlinguistic context. A perfect grammar, we might suppose, would project a given formal feature only when necessary and avoid redundancy[17].

8. Just as there seems to be no conceptual necessity for clauses to contain Tense projections, so too there seems no conceptual necessity for them to contain Agreement[18] projections (housing subjects and objects). For example, Bobaljik (2000) argues that language differ parametrically in respect of a **Split IP Parameter/SIP** in that languages like English project a simple IP/VP structure for the propositional component of clauses, whereas languages like Icelandic project a more complex AgrSP/TP/AgrOP/VP structure. The two types of language differ in respect of the following five properties, according to Bobaljik:
   • the availability of two subject positions between CP and VP
   • the possibility of transitive expletive constructions
   • the availability of a VP-external derived object position
   • obligatory raising of the verb to INFL in non-V2 environments
   • the possibility of multiple inflectional morphemes on the verb stem

9. Consistent with the *necessity* view of projection (under which a given formal feature F is projected into the syntax *only when necessary*) is the possibility that a child at a given stage of development may have acquired some feature F (and be able to parse adult structures containing F) but see no necessity to project F in speech production. For example, if a child at a given stage of development projects only items encoding new information and not those encoding given information, it follows that a child who has acquired the determiner like *the* (and is aware that its primary use is to mark given-ness) may nonetheless produce structures such as *Want read book* in contexts where adults would say 'I want to read *the* book'. On this view, we would expect comprehension to outstrip production, in the sense that children 'know' more about syntax than their speech production would suggest[19]. Moreover, it would scarcely be surprising (on this view) if there were a developmental stage at which some formal feature F is *optionally* projected (i.e. projected only where the absence of sufficient contextual information makes it necessary). For example, it could be that at a given stage a child projects Tense as a formal feature only where there are insufficient contextual clues for Tense to be discourse-determined: such a child would then appear to be at a stage where Tense is optionally projected. This would provide one account of Wexler's (1994, p.335) claim that children go through an *Optional Infinitives/OI* stage which is characterised by 'the optionality of T'. In a similar vein, Schütze and Wexler 1996 and Schütze 1997 claim that child utterances like *He cry* at the OI stage show a tense deficit[20].

10. Just as we might expect a perfect language to avoid redundant syntactic material, so too we might expect (in accordance with Grice's 1975 *Be concise* principle) that a perfect language would avoid redundant phonological material and *spellout phonological features only when necessary*. Such a principle seems to operate in adult English and to underlie the null spellout of traces[21] (e.g. in *Which shop are you ~~are~~ going to ~~which shop~~?*), the ellipsis of phrases (e.g. in *He wants to go to the cinema but I don't ~~want to go to the cinema~~*), the gapping of heads (e.g. in *Are they helping you or ~~are~~ you ~~helping~~ them?*) and the zeroing of arguments (as in cookbook sentences such as *Pour into pan and stir until thick*). In a perfect language, we might imagine that lexical items would have a null PF-spellout if their content can be pragmatically determined (i.e. if their content is *given* by the linguistic or nonlinguistic context). From this perspective, it would not be surprising if young children freely allowed arguments and predicates to be null if they are *given*. In this connection, consider the following dialogue between Alison at 1;10 and her mother (from the Bloom files on CHILDES):
   MOT: Where are the cookies?
   ALI: In bag (*pointing in direction of bag*)
   MOT: In the bag?
   ALI: Baby eat
It would seem that when Alison says *Baby eat*, she takes the complement *the cookies* as given (because it has been mentioned in the immediately preceding discourse context by her mother) and hence assumes that she has no need to spell it out in her utterance. Likewise, when she says *Pull* while pretending to move the truck she is playing with back and forth, the subject (*I*) and object (*the truck*) are taken to be given by the discourse setting and hence not spelled out. And similarly,

when her mother says 'We take a bath' and Alison (at 1;8) replies 'Mommy shower', she treats the predicate *take* as given, hence not needing to be spelled out overtly. In a perfect language, we might conjecture, zeroing would be constrained solely by pragmatic principles (relating to what is given) and would operate free of grammatical constraints (as suggested in Radford 1990). What Alison has yet to learn is that one of the imperfections of English is that it imposes syntactic constraints on zeroing: for example, a predicate can only be zeroed in a

co-ordinate structure in adult English (hence we can say *Daddy takes a bath and Mummy* ~~takes~~ *a shower* but we can't answer **Mummy a shower* to a question like 'Does Mummy take a bath or a shower?')[22].

11. Reasoning along similar lines to those in §4, we might further hypothesise that the nature of language itself in part determines the order of acquisition of formal features. In this connection, consider the order in which the formal features of T and SU(bject) are acquired. In adult English, the formal features of T in root clauses include an interpretable tense feature, and uninterpretable (person/number) ϕ-features[23]. In a clause like *They are working*, the subject/SU is first-merged (and θ-marked) in spec-vP, with V raising to *v* if *v* is affixal. T carries an interpretable present-tense feature and unvalued/uninterpretable person/number features; SU carries interpretable person/number features and an uninterpretable case-feature; T also has an EPP feature, requiring the subject *they* to raise to spec-TP. T serves as a Probe for agreement and identifies SU in spec-vP as its Goal. One reflex of the agreement relation between the two is that SU values the unvalued person/number features of T as 3Pl, and deletes them (rendering them invisible at LF). Another is that T values (as nominative) and deletes the uninterpretable case-feature of SU: for concreteness, let's assume that the case-feature of a Goal in English is valued as genitive if the Probe is a Determiner (of the relevant kind), Nominative if the Probe is a tensed T, and Accusative otherwise. Let's also assume that a 3Pl personal pronoun in English is spelled out as *they* if nominative, *their* if genitive and *them* otherwise (and similarly for the corresponding case forms of other pronouns). Finally, let's assume that regular verbal affixes are spelled out as +*ing* if progressive, +*n* if perfect, +*d* if past tense, +*s* if third person singular present tense, and +ϕ otherwise (so that the affix required in *John snores* is +*s*).

12. If the formal features of T and SU are acquired sequentially rather than simultaneously, we should expect that (if GCA leads the child to construct a perfect initial grammar) interpretable features will be acquired before associated uninterpretable features: so, an interpretable feature [F1] will be acquired before an uninterpretable feature [F2] with which it is associated via an agreement relation [24]. If so, there could in principle be a stage at which the child has acquired the interpretable person/number features of SU and/or the interpretable tense properties of T but has not yet acquired the uninterpretable person/number features of T or the uninterpretable case-feature of SU. On this view, however, there would be no purely linguistic reason to posit any specific order of acquisition for the number properties of SU, the person properties of SU and the tense properties of T[25]. It seems more likely that these are determined by cognitive factors (See §3): for example, number would be expected to be acquired before person or tense if it is cognitively less complex, in that tense specifies the relative location of an event in time (relative to speech time and reference time) and person specifies the relative location of an entity in space (relative to speaker and hearer), whereas number is a non-relational property. If there is a stage at which children have acquired number but not person, we might expect to find children using noun expressions (but not personal pronouns) for self-reference and addressee reference as well as third-party reference (so that we find e.g. *Baby help Mummy* rather than 'I'll help you'). In this connection, it is interesting to note that Bloom, Miller & Hood (1978, p.195) observe that Gia and Kathryn initially used only nominal subjects and objects, with pronouns being acquired at a later stage (when MLU exceeded 2.0). It may well be that maturational factors also determine that *binding principles* do not operate in early child grammars (and that these principles do not become operative until such time as children have acquired a fully specified set of personal pronouns): this is suggested by examples like *Eve fix Eve puzzle* produced by Eve at age 1;8 (file 5 of the Eve files in the Brown corpus on CHILDES).

13. But while there is no reason to suppose that the interpretable person/number and tense features of SU and T might be acquired sequentially, theoretical considerations lead us to expect that the uninterpretable person/number features of a finite T and the uninterpretable nominative case feature of SU will be acquired simultaneously. This is because only an active SU which has a structural case-feature can erase uninterpretable ϕ-features of T, and conversely only an active ϕ-compete T can erase the uninterpretable structural case-feature of SU[26]. Given these assumptions[27], the uninterpretable person/number features of T will be acquired at the same time as the uninterpretable structural case feature of SU.

14. On the assumptions made in §11, there could in principle be a stage at which early child nominals lack structural case. In this connection, it is instructive to look at the expressions produced by Jonathan (in the Braine files on CHILDES) at ages 1;11, 2;0 and 2;1. At the relevant stage, he uses nominal expressions but not personal pronouns[28], producing utterances like *Allgone stick*,

Bounce ball, *Hurt toe*, *See car*, *Ride car*, *Eat grape*, *Boy walk*, *Daddy sit*, *Shirt wet*, *Shoes on*, *Big book* etc. In all 35 of the possessive structures he produces, the possessor is a bare noun which does not carry the genitive case-inflection +s; 34 of these structures involve a prenominal possessor (e.g. *Mommy bread*, *Daddy shoe*, *Andrew book*, *Elliot cookie*) and the remaining 1 involves a predicative possessor (*This Nina* 'This is Nina's')[29]. Moreover, Jonathan uses bare nouns as complements of intransitive heads: for instance, he unfailingly omits the dummy case-assigner *of* in obligatory contexts in structures such as *Blue ball wool* 'a blue ball *of* wool', *drink water* 'a drink *of* water', *out car* 'out *of* the car' and *out chair* 'out *of* the chair'. The absence of overtly case-marked personal pronouns, genitive `s and case-assigning *of* in his grammar at the relevant stage suggests the absence of a case system. If case is assigned under agreement, it is not surprising that he appears not to have acquired agreement either.

15. At first sight, the claim that early child nominals could lack case might seem to be ruled out by innate architectural principles: after all, much work over the past two decades has assumed some version of the *case filter* under which all nominal expressions are required to have case. However, within the framework adopted here, theoretical considerations require that nominal expressions carry case *only when necessary*. So, for example, a noun expression will be required to carry case when it is the subject of a φ-complete T, but not when it is the subject of a

φ-defective clause – e.g. in newspaper headlines such as *Husband cheating, wife told* – a structure in which both *husband* and *wife* are bare nominals which cannot be substituted by a case-marked personal pronoun like *he* or *she*.

16. While it seems by no means implausible to suppose that nominals may not always require case, it might seem to be a morphological necessity that personal pronouns require case, since they are overtly inflected for case. However, the assumption that personal pronouns require a formal case feature in the syntax is called into question by sentence-fragments like *Him* as a reply to *Who did it?*, since if *Him* carries an uninterpretable accusative case feature, it is not obvious how this feature will be erased (there being no φ-complete Probe available to serve as a case-eraser): rather, it might be argued that a sentence fragment like *Him* is a caseless form which receives the spellout *him* in the morphophonology by default (See §10). If nominal and pronominal expressions have case *only when necessary* (e.g. only when they enter into an agreement relation with a φ-complete Probe), a sentence-fragment (whether nominal or pronominal) does not need case. By the same token, a subject will only require case in a TP headed by a φ-complete T, not in a TP structure headed by a φ-defective T (nor indeed in a vP structure which projects no TP). So, a child who projects a T which carries tense but no

φ-features might be expected to produce utterances like *Daddy do/did it* and *Him do/did it* in present/past tense contexts, given the assumptions made about morphology in §9: *him* will be a caseless form here, and present-tense verbs will be bare if T is ø-incomplete, but past-tense forms will carry the affix *–d*. If EPP is an agreement feature (so that α moves to spec-TP if α is the closest expression which agrees with T[30]), it follows that a φ-defective T will have no EPP feature, so the subject will remain in situ within vP. If negation is projected above vP[31], we might expect to find early negatives of the form *No Daddy do it*/*No me have bath*, and in situ unaccusative arguments (e.g. *Allgone sweeties[32]*).

17. The core idea underlying the **perfection model** outlined here is that children produce *Perfect Initial Syntactic Structures* (PISS); in the various sections below, I flesh out this idea. I begin by looking at the projection of *argument structure* in children's initial speech production, for concreteness looking at the earliest structures containing verbs with nominal arguments produced by Alison (in the Bloom files on CHILDES). The earliest of her files containing such structures are the 1;8 and 1;10 files. In these two files, Allison produces a wide range of structures in which verbs are merged with nominal arguments[33], including *Baby eat*, *Mommy open*, *Pig ride*, *Eat cookie*, *Get diaper*, *Get toys*, *Hurt knee*, *Wiping baby chin*, *Walk school*, *Buy store*, *Get Mommy cookie*, *Baby eat cookie*, *Baby ride truck* and *Man drive truck*. The assumption which the **perfection model** leads us to make about such structures is that they involve a pure projection of argument structure mediated by the minimally conceptually necessary operation *Merge* (which Chomsky 1999, p.2 describes as 'the indispensable operation of a recursive system', an operation which 'comes free'), and involve perfect structures in which a verb *directly* θ-marks its arguments.

18. A key assumption embodied in this claim is that there is no *indirect* theta-marking of arguments by verbs at this initial stage, so that children will initially say (e.g.) *Go school* rather than *Go to school*, omitting the preposition *to* which (in adult English) serves the function of indirectly θ-marking *school*. From the perspective adopted here, indirect θ-marking of arguments by predicates is an imperfection, requiring as it does the projection of a lexically idiosyncratic preposition[34] which assigns an uninterpretable case-feature to the relevant argument via an invisible agreement relation. It is therefore interesting to note that *none* of the structures produced by Allison in these two files shows any evidence of indirect θ-marking: e.g. she says *Walk school* rather than 'Walk *to* school', *Buy store* rather than 'Buy them *at* the store', *Peeking Mommy/lady* instead of 'Peeking *at* Mommy/the lady', *Put away*

Allison bag instead of 'Put them away *in* my bag', *Baby (doll) ride truck* instead of 'Baby doll can ride *in* the truck', and *Wait truck* instead of 'Wait *for* the truck'. Likewise, Allison uses bare nouns (without an indirect θ-marking preposition) to reply to adult questions containing an indirectly θ-marked wh-pronoun, as we see from question-answer pairs like: *Where is she gonna go? – School* and *Where are you going? – School*.

19. Given the assumptions in §16-§17, a child utterance like *Man drive truck* (at the stage described here) will have the following argument structure. The bare verb *drive* will merge with (and thereby assign the θ-role THEME to) its bare noun complement *truck*, so forming the VP *drive truck*[35]. This VP will merge with an abstract agentive light-verb *v*[36], and the resulting structure will in turn merge with (and assign the θ-role AGENT to) the bare noun *man*, deriving:

   [vP [N Man] [[v ø] [VP [[V drive] [N truck]]]]

The nouns *man* and *truck* are φ-defective (carrying neither person nor case[37]) and so do not agree with the verb *drive*, which carries neither tense nor agreement features (temporal reference being discourse-determined)[38].

20. What also needs to be accounted for is the fact that Allison also produces a large number of sentences with 'missing' arguments (e.g. *Eat cookie*, *Open box*, *Baby eat*, *Mommy open*, *Put on*, *No eat*): in her 1;10 file, for example, 81/107 (76%) of the verbs she produced had a null subject and 36/71 (51%) of the transitive verbs she produced had a null object. If (as suggested in §8) zeroing is determined by pragmatic rather than syntactic principles in a perfect grammar (so that constituents representing given information are zeroed), one way of handling such sentences is to suppose that they involve syntactically projected null arguments which are directly θ-marked by the verb. On this view, a sentence like *Baby eat* might have the structure:

   [vP [N Baby] [[v ø] [VP [[V eat] [N Ø]]]]

What is assumed here is that null arguments (in this case, a null direct object) are null nouns which are given a null spellout by virtue of representing *given* information. This does not entail discontinuity with adult English, since the latter also has a null pronominal N (= Ø) in sentences such as 'I like the black shoes, but *the brown Ø* are more comfortable': this null pronominal N can either be used anaphorically (as in the preceding example) or deictically (as would be the case if I tried on two pairs of shoes and said 'I can't make up my mind whether *the black Ø* or *the brown Ø* are more comfortable'). Like Allison's overt nouns, the null noun she uses is (by hypothesis) φ-incomplete and lacks person/case properties[39]; merger of a verb with a null φ-incomplete noun involves a direct θ-marking (but no case or agreement) relation between V and N.

21. The assumption that children's initial argument structures are a pure projection of thematic structure (via a merger operation involving direct θ-marking) can be extended to possessive nominals like *baby chin*, if (adapting Cinque 1994) these are taken to include the structure:

   [αP Possessor [[α ø] Nominal]]

and if α θ-marks its specifier and complement (assigning the role POSSESSOR to its specifier and POSSESSUM to its complement) but does not case-mark either[40]. If the *nominal* complement of α can be an adjective+noun structure (as in adult English), we can account for the fact that children at the relevant stage produce possessive nominals like *Daddy new car*.

22. The analysis of merger and θ-marking sketched in §17-§21 above assumes that θ-marking is independent of case- and agreement-marking, and that pure merger involves only θ-marking. There is some empirical evidence that this is so even in adult grammars. For example, *that*-clauses are θ-marked arguments which do not have case or agreement properties, as we can see from sentences like *It does seem that he is unwell and that he can't go out*: the co-ordinate CP complement is θ-marked by *seem*, but has no φ-features or case and so is inactive for agreement; expletive *it* has to be inserted in order to provide a Probe which can value and erase the uninterpretable person/number features of *does*. Moreover, a transitive subject which is merged in spec-vP with (the immediate projection of) a light-verb in structures like *John is playing golf* is θ-marked by (but does not enter into a case/agreement relation with) the light verb heading vP (*John* enters into a case/agreement relation with the tense auxiliary *is*). Likewise, in passives such as *John was arrested*, the DO *John* is initially merged with the verb *arrested* and is θ-marked by the verb without entering into a case/agreement relation with it (rather, *John* enters into a case/agreement relation with the tense auxiliary *was*). The same is true of unaccusative direct objects in structures like *John has arrived*, with *John* initially being merged with and θ-marked by (but not agreeing with or being case-marked by) *arrived*. If a transitive direct object is θ-marked by V but assigned case under agreement with v, the overall conclusion we reach is that merger of a verb with an argument *always and only* involves θ-marking (not case/agreement marking). This in turn means that merger of verbs with their arguments *must* of necessity be based purely on θ-marking in child grammars also. If the initial argument structures which children produce are perfect structures generated by *direct θ-merger* (in which V/v merges with and directly θ-marks N), it follows that there will be no indirect θ-

marking, no case, no agreement and no uninterpretable φ-features in the initial structures produced by young children.

23. An interesting possibility raised by the hypothesis that children initially produce perfect structures is that they may initially treat as *uninterpretable* features which in adult grammars are *interpretable*. In this connection, consider the acquisition of the aspectual properties of progressive and perfect particles in English. The earliest aspectual structures produced by English children typically comprise a 'bare' *+ing/+n* participle structure (i.e. a structure containing a progressive/perfect participle but no progressive/perfect *be/have* auxiliary). For example, in her 1;8 and 1;10 files (in the Bloom corpus on CHILDES), Alison produces 30 progressive participle structures (including *Walking around*, *Standing up*, *Peeking Mommy*, *Eating Mommy cookie* and *Wiping baby chin*) none of which contain the progressive auxiliary *be*. Since these are used in appropriate contexts, a reasonable assumption to make is that Alison's progressive participles at this stage carry an *interpretable* aspect feature. It might appear that this is true of adult participles as well; but in fact, there is some reason to think that in adult English structures of the form *He has gone home/He is going home*, the affixes *+ing/+n* encode *uninterpretable* aspect features. The relevant evidence comes from elliptical structures such as *He hasn't yet gone home but probably will ~~go home~~ soon* (where barring marks ellipsis of *go home*)[41]. It is clear that ellipsis does not require PF-identity, since the ellipsed expression *go home* is headed by the infinitive form *go* whereas its antecedent *gone home* is headed by the perfect participle *gone*. It is therefore more likely that ellipsis requires LF-identity (i.e. identity of interpretable features). However, the LF-identity requirement will not be met if *gone* carries an interpretable perfect aspect feature which is lacking in *go*. By contrast, if we assume that the aspect feature carried by *gone* is uninterpretable, the LF-identity requirement will be satisfied. Such an analysis means that in adult English structures like *He has gone home/He is going home*, the auxiliaries *have/be* carry an interpretable [Perf-/Prog-Aspect] feature which values and erases the unvalued and uninterpretable [u-Aspect] feature carried by the participles *gone/going*. However, as already noted, it seems likely that in child structures like *Eating Mommy cookie* which contain an aspect-inflected verb but no superordinate auxiliary, aspect is an interpretable feature.

24. What the discussion in §22 suggests is that children go through a stage at which the earliest features they acquire are initially analysed as LF-interpretable – even if (as in the case of the aspect feature of participles) the corresponding feature in adult grammars is uninterpretable. This is consistent with the **perfection model** outlined here, which holds that children seek perfection and initially assume (until faced with overwhelming evidence to the contrary) that any feature they acquire is interpretable. Of course, this assumption raises the important question of how children subsequently come to learn that the aspect feature carried by participles is uninterpretable. It may be that at the point where they can (fully) parse adult structures like *Daddy must be working*, the principle that (in a perfect structure) all syntactic heads contain *interpretable* features[42] forces them to posit that *be* carries an interpretable aspect feature, and that the aspect feature carried by the *+ing* participle is an uninterpretable inflectional feature. At this point, perhaps, they come to project an AspP (Aspect Phrase) in the clauses they produce[43].

25. If the analysis of the acquisition of Tense in Lebeaux (1987) is along the right lines, there may be significant parallels between the acquisition of Aspect and the acquisition of Tense. Lebeaux argues that Tense is initially projected on V rather than on T. In terms of the framework used here, this would seem to amount to claiming that children's initial tensed clauses like *My did it* have the status of vP rather than T, with the lexical verb (*did*) carrying an interpretable Tense feature. However, tensed verbs in adult English arguably carry an *uninterpretable* Tense feature, as we can see from ellipsis in structures such as *John went swimming yesterday, but I don't think he will ~~go swimming~~ tomorrow*: since deletion clearly does not involve PF-identity, it must involve LF-identity of interpretable features; but this entails that the past tense feature carried by *went* is uninterpretable. More generally, it means that in an adult structure like *John T went home,* T carries an interpretable past tense feature and the verb *went* an uninterpretable and unvalued feature which is valued (as past) by T. If this is so, and if Lebeaux is right in positing that children initially project Tense as a feature of verbs, it follows that children initially misanalyse the uninterpretable tense inflections carried by lexical verbs as encoding an interpretable tense features – precisely as the **perfection model** might lead us to expect.

26. We might make similar assumptions about the Tense properties of infinitives. In adult English clauses like *He will win*, the verb *win* might be argued to carry an uninterpretable tense feature which is valued and deleted by the auxiliary *will*. Likewise, in *He intends to win*, the verb *win* has its tense feature valued and deleted by infinitival *to* (whose tense is determined by properties of the matrix verb and the matrix T, according to Stowell 1982). If verbs carry an interpretable (rather than uninterpretable) Tense feature in early child grammars, we should expect children's initial infinitive clauses to lack infinitival *to* (since the latter serves to erase the uninterpretable tense feature carried by the verb in adult English). And indeed, this is the case (as noted by Radford 1990, p.140): e.g. the earliest infinitive clauses produced by Daniel at 1;7 are *to*-less structures like *Want have money* and *Want Teddy drink*. Moreover, if the tense feature of early child infinitives is interpretable, we can provide a straightforward account of the occurrence of *root infinitives* in children's initial speech output during what Rizzi (1994) terms the *root infinitive stage*.

27. It may also be that we find a similar situation in respect of the acquisition of the *number* properties of nouns. If we look at the noun expressions used by Allison in her 1;8 and 1;10 files (in the Brown corpus on CHILDES) we find evidence that she has acquired the number properties of nouns, since she uses regular plurals like *cookies/toys* and irregulars like *children*. However, she unfailingly omits the singular article *a* from indefinite singular expressions, saying e.g. *Build tower* where an adult would say 'Build *a* tower': more precisely, *all* of the 327 singular count noun expressions she produces in the 1;8 and 1;10 files are bare (determiner-less) nominals. How can we account for the systematic difference between adult and child English in this respect? One way of accounting for the requirement to use *a* with a singular (indefinite) count noun in adult English is to posit that in quantified expressions like *a tower*, number is an *uninterpretable* formal feature of nouns and an *interpretable* feature of the article *a*: the noun *tower* enters the derivation carrying an unvalued, uninterpretable number feature [u-Num]; once *a* has merged with *tower* to form *a tower*, the interpretable [Sg-Num] feature of *a* can value the uninterpretable number feature of *tower* as [Sg-Num] and erase it. Some empirical evidence that number is an uninterpretable feature of nouns in English comes from *noun-gapping* structures like *She tried on both dresses, but the blue ~~dress~~ was too big*, where the noun *dress* in the second clause is gapped: clearly gapping cannot require PF-identity, since the gapped noun is the singular form *dress* whereas its antecedent is the plural form *dresses*; if gapping requires identity of LF-interpretable features, it follows that the number feature carried by *dress/dresses* in adult English must be uninterpretable. From this, it follows in turn that a structure like *Build tower* crashes in adult English because the bare noun *tower* has an unvalued and uninterpretable number feature which cannot be valued or deleted[44]. Why, then, should Allison continue to produce bare singular count nouns like *tower* long after she has acquired the number morphology of nouns? One possibility is that she initially treats number as an *interpretable* feature of nouns; hence, a bare count noun like *tower* can function as an argument in *Build tower* by virtue of containing an interpretable [singular-number] feature[45]. The assumption made here that children may initially mis-parse an uninterpretable feature as interpretable is consistent with the analysis of Aspect in §22 and Tense in §24, and with the more general claim in the **perfection model** outlined here that children produce *perfect initial syntactic structures* in which the only formal features they project are interpretable.

28. It is interesting to compare the nominal structures produced by Alison at 1;8 and 1;10 with those produced by Jonathan (in the Braine files in CHILDES) at ages at ages 1;11.15, 2;0.0 and 2;1.21. The fact that Jonathan produces regular and irregular plural nouns (saying *Shoes on*, *Socks on*, *Big pants*, *All wet pants*, *Clean socks, Feet light* etc.) suggests that he has acquired the number morphology of nouns at this point. But (like Alison), all the (156) unquantified singular count noun expressions which he produces are bare[46] (e.g. in *Hurt toe, Allgone big stick, See tower, Man walk, Hat on, Shoe wet, Hand eye, Stone outside*, *Red light down there, There other book, Red car*, *Dirty face* etc.). This might suggest that (like Alison) he treats number as an interpretable feature of nouns. However, any such analysis would fail to account for the fact that of the 19 structures of the form *two+count noun* which he produced, 17 (89%) contained a noun with no number marking (*Two plane, Two stick*, *Two spoon, Two shoe, Two fly*, etc.) and only 2 (11%) contained a plural noun (*Two ducks, Two raisins*). How can we account for the fact that Jonathan seems to mark number on bare nominals but not on quantified nominals? One answer is to suppose that he treats number as an *interpretable* feature on bare nouns, but an *uninterpretable* feature on quantified nouns, and that children like Jonathan at a very early stage generally project perfect structures which contain only interpretable features. So, in an utterance like *Socks on*, the bare noun *socks* has an interpretable number feature which must be projected if the noun is to be given a plural interpretation at LF. By contrast, in *two cup* the quantifier *two* carries an interpretable number feature and the noun *cup* carries no number feature (because the number features of quantified nouns are uninterpretable, and Jonathan at this stage generally does not project uninterpretable features[47]). In the more adult-like structure *two raisins*, the noun *raisins* carries an uninterpretable number feature which is valued and erased under concord by the interpretable plural number feature carried by the numeral quantifier *two*.

29. It might at first sight seem implausible to suppose that the number feature carried by Jonathan's nouns is an *ambivalent* feature which is interpretable in bare nominals and uninterpretable in quantified nominals. But in fact there is evidence that features can be ambivalent in adult grammars. Consider, for example, the negation feature carried by an item like *nothing* in varieties of English with negative concord in sentences such as *I didn't say nothing*[48]. Here, the negative feature carried by *nothing* is uninterpretable, and is erased under concord with the interpretable negative feature carried by *not*. But consider what happens if someone replies *Nothing* to the question 'What did you tell them?' In this second case, the negative feature of *nothing* is interpretable: this may be because the negative feature on *nothing* in negative concord varieties[49] can only be uninterpretable if it is erased by a c-commanding interpretable negative like *not*, and must be interpretable otherwise; hence (e.g.) *nothing* carries an interpretable negative feature in *Nothing happened*. More generally, an *ambivalent* feature F (i.e. a feature which can be either interpretable or uninterpretable) can only be uninterpretable if erased by a c-commanding Probe with a matching interpretable feature, and is interpretable otherwise. If (as suggested in §27) the number feature

carried by Jonathan's nouns is an *ambivalent* feature at the relevant stage, it will be interpretable where the noun expression in question is merged with a quantifier but uninterpretable otherwise[50]. What Jonathan has yet to learn is that number is an obligatory uninterpretable feature of count nouns in English – hence (e.g.) the requirement for an indefinite article to modify a predicate nominal in adult English sentences like *He is a teacher/*He is teacher* in order to erase the uninterpretable number feature of *teacher*[51]. It may be that Alison and Jonathan represent two different stages in the acquisition of number, with number initially being treated (by children like Alison) as an interpretable feature of nouns, then later being treated (by children like Jonathan) as an interpretable feature of bare nouns but an (optional) uninterpretable feature of quantified nouns, and finally being treated (as in adult English) as an obligatory uninterpretable feature of all count nouns[52].

30. The assumption that children initially parse uninterpretable features as interpretable has interesting implications for the acquisition of *case*. One possibility which it raises is that the earliest case-marked pronouns used by children might carry *inherent* rather than structural case (i.e. case assigned as a function of argument structure/θ-marking rather than agreement)[53]: for example, an external argument in spec-vP might be assigned both the θ-role AGENT and inherent nominative case by the agentive light-verb heading vP; an external argument in spec-POSSP might be assigned the θ-role POSSESSOR and inherent genitive case by the head POSS constituent of POSSP; and internal arguments might be assigned accusative case. Vainikka (1994) considers the possibility that early child subjects receive inherent case, but rejects it on the grounds that pronominal subjects in early child grammars typically show variable case-marking: the single example she gives to illustrate her point is the alternation between *I get it* and *Me get it*. However, this example is far from compelling if *I* represents an AGENT argument first-merged in spec-vP in the first example and *me* represents a GOAL argument first-merged in spec-VP in the second: indeed the subject of *get* can have precisely this dual thematic status in adult English, serving as an AGENT argument in *I usually get a present for my wife on our anniversary* and as a goal argument in *I usually get a present from my wife on our anniversary*; but because adult English assigns structural case to subjects, both agent and goal subjects surface as nominative in root clauses. Variability in the case-marking of root subjects is precisely what we should expect if subjects are assigned inherent case in early child grammars[54].

31. The possibility of subjects being assigned inherent case cannot be ruled out in principle if adult *quirky case* subjects (e.g. dative EXPERIENCER subjects in Icelandic) are assigned inherent case under θ-marking. Of course, since subjects don't have inherent case in adult English, any such analysis would have to account for how children unlearn inherent case-marking of subjects in favour of structural case-marking. It may be that (to use the metaphor adopted by Janet Randall 1992), inherent case-marking of SU is *catapulted* out of the grammar once agreement is acquired: indeed, this would be required on theoretical grounds if (as Chomsky 1999 posits) subject-verb agreement is contingent on the subject carrying an uninterpretable structural-case feature. If (as Chomsky 1999, fn.15 posits) quirky-case subjects in Icelandic have 'inherent case with an additional structural case feature', it is logically possible that (perhaps between the earlier *inherent case* stage and the later *structural case* stage) there might be a *quirky case* stage at which agreement has been acquired and finite subjects carry both inherent case and structural (nominative) case (so that we find non-nominative pronouns used as subjects of verbs which they agree with in number and person). It is also possible that if (at some particular stage) the ϕ-features of T are only optionally projected, SU may be assigned inherent case if T is ϕ-defective and structural case if T is ϕ-complete: e.g. for a child alternating between *I did it* and *My did it*, it may be that *I* is assigned structural nominative case and *my* inherent case (if *my* is a 'marker of agentivity', as Budwig 1995, p.82 suggests).

32. The overall conclusion to be drawn from the discussion here is that although adult languages are imperfect systems, the acquisition process itself is perfect (in the sense that it maximises perfection), the initial grammars developed by children are perfect, and the initial syntactic structures produced by children are perfect. To return to David Crystal's remarks in §1: children may indeed be noisy, smelly and dirty creatures, but they are *perfect language learners*; more accurately, they are perfectionists who seek perfection in the imperfect input they receive.

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[2] One possibility is that some features are universal, whereas others are parameterised. This raises the question of whether universal features are available from the outset or acquired according to a maturational schedule.

[3] This view is reinforced by the difficulties young children are reported to have with *person shift* (e.g. in cases where a child says *You no want bath* in reply to a question like 'Do you want a bath?'). By contrast, there seem to be no reported cases where (e.g.) children systematically misinterpret plural expressions as singular.

[4] In adult English, names are third person expressions: e.g. if I want to refer to myself using my own name I have to say *Andrew is hungry* and not *Andrew am hungry*.

[5] I have excluded simple names (e.g. *Alison*, *Mommy*) and compound names (e.g. *Baby Alison*) from this count.

[6] Alison also seems to acquire Aspect significantly earlier than Tense, and it may well be that this order too is determined by cognitive maturation, in that Tense encodes a complex set of temporal relations involving event time, reference time and speech time.

[7] Other than those which are conceptually necessary, if such there be.

[8] On over-regularisation, see Marcus et al. (1992).

[9] In the sense of Hyams (1987) and Jaeggli and Hyams (1988)

[10] If the reasoning here is on the right lines, we might expect subject-verb agreement morphology to be acquired earlier in uniform languages like Spanish and Italian than in non-uniform languages like English.

[11] This term will be used here to indicate features which are uninterpretable at the LF-interface (rather than features which are uninterpretable at the PF-interface).

[12] Chomsky (1999, p.3) notes that 'The relation agree and uninterpretable features are prima facie imperfections.'

[13] This assumption is consistent with Chomsky's (1999, p.6) remark that 'T is ϕ-complete only when necessary'. It may be that the EPP-features carried by heads (although uninterpretable in themselves) are necessary in order to ensure LF convergence: e.g. interrogative wh-operators move to spec-CP (driven by an uninterpretable EPP-feature of C) in order to be interpreted as operators binding a variable (and having scope over the whole clause); objects move to spec-vP (driven by an uninterpretable EPP-feature of v) in Object Shift languages in order to be interpreted as (e.g.) definite/specific/unfocused – and so on.

[14] Chomsky (1998, 1999) argues that expletives contain only uninterpretable features (e.g. an uninterpretable person feature in the case of *there*). Hyams (1986 p.63) claims that early child grammars are 'characterised by a notable lack of...expletive pronouns' (though see Valian 1991 for a dissenting view).

[15] In adult English, questions in which force is syntactically projected on C differ from questions in which force is marked suprasegmentally in that the former (but not the latter) are operator questions which license polarity items: see Radford 1997, pp.298-9.

[16] In this connection, it should be noted that *none* of the verbs produced by Allison in her 1;4, 1;7 and 1;8 files (in the Bloom corpus on CHILDES) carries any overt tense inflection, and only one of the verbs in her 1;10 file does.

[17] A complication not discussed in the text is that the learner might initially hypothesise (e.g.) that *tense* and *force* are encoded on the same item (so that instead of separate INFL and COMP items we have a single CONFL: see Aldridge 1988, pp 109-113 for discussion of this possibility in relation to English; and Clahsen, Eisenbeiss and Penke (1996) in relation to German). However, if innate architectural principles specify that 'phases are configurations of the form F-XP' (Chomsky 1999, p.11), and if C universally selects a TP complement (as Chomsky 1999, p.6 seems to imply), a CONFL constituent might be excluded in principle.

[18] Chomsky (1995) argues that the principle of Full Interpretation rules out Agreement heads which are devoid of semantic content. However, as Bobaljik (2000) points out, this point can be overcome if Agr heads are reanalysed as carrying interpretable features – e.g. if AgrS is reanalysed as a Mood head.

[19] Recent research using the *Head-Turning Preference Procedure/HTPP* has suggested that children are sensitive to formal features in comprehension which they do not project in production. Within the framework adopted here, this discrepancy might be accounted for by positing that formal features are projected in production *only when necessary* – though difficult questions remain about the nature of the apparent knowledge revealed by HTPP.

[20] The exact nature of this deficit in their system is not clear, since they posit that the relevant child clauses are TPs, and that subjects are assigned nominative case only in *tensed* clauses. Perhaps they assume that a tense-defective T is specified as [+Tns], but not further specified as [±Past], with the feature [+Tns] triggering nominative case assignment and the absence of the *+s/+d* inflection on the verb being attributed to absence of the [±Past] feature. Perhaps [+Tns] is assigned a discourse-determined tense value in such cases, but it is not clear what the relevant discourse mechanisms are. Or perhaps [+Tns] is in effect a [+Realis] *mood* feature, so that T/INFL early child clauses is specified as carrying [±Realis] mood, with [+Realis] forms optionally being further specified for tense as [±Past]. (See Hyams 2000 for discussion of the mod properties of early child clauses).

[21] The barred material is, by hypothesis, present in the syntax but not spelled out in the phonology.

[22] An interesting (and plausible) hypothesis to explore is that the absence of syntactic constraints on zeroing in children's initial grammars correlates with a ϕ-feature deficit.

[23] The discussion here is simplified by overlooking the possibility that T may also encode *finiteness* and/or *mood*.

[24] Note that this does not entail that *all* interpretable features are acquired before *any* uninterpretable features, as Martin Atkinson points out to me.

[25] However, if structural nominative case is assigned by a tensed T, it follows that Tense must be acquired earlier than (or simultaneously with) structural case-marking of subjects.

[26] Chomsky (1999, p.4) posits that 'α must have a complete set of ϕ-features (it must be ϕ-*complete*) to delete uninterpretable features of the paired matching element ß' and that 'Probe and Goal most both be active for Agree to apply.'

[27] One question raised by the assumptions made here is how a child who has acquired (say) the number but not the person features of a nominal expression N would 'know' that N is ϕ-incomplete; the assumption must be that the Language Faculty determines ϕ-completeness.

[28] The only exceptions to this are the three utterances *Have it egg*, *Have it milk*, and *Have it fork*; but some have claimed that these involve a segmentation error in which *haveit* is treated as a single lexical item.

[29] Given the analysis in §19, *Nina* here may be a structure of the form [αP Nina [[α ø] [N Ø]]], where α assigns the θ-role POSSESSOR to *Nina* and has a null (discourse-identified) N as its POSSESSUM complement. Jonathan produces two structures in which the possessor is preceded by a numeral quantifier (*two Daddy door*, *one Daddy car*); these may indicate that (as in Italian possessives like *un mio amico* 'a my friend' = 'a friend of mine') the possessor remains in its base position below the quantifier, suggesting that the possessor is inactive for movement by virtue of being caseless and hence is unable to raise across the quantifier to spec-DP (hence we don't get e.g. *Daddy's two doors*). However, the precise interpretation of these examples is unclear in the absence of contextual information.

[30] Some assumption of this kind seems necessary in order to preclude the possibility of the EPP feature of T being satisfied by an adverbial which is closer to T than the subject in spec-vP – e.g. in order to block sentences such as **Already has John finished his assignment*. Chomsky (1999, p. 6) suggests that it may be possible to 'associate EPP with ϕ-completeness' – though the precise nature of the association he envisages is unclear.

[31] However, if negation is projected above the constituent over which it has scope, we might expect to find negation projected above vP when the negative has wide scope (and includes the subject within its scope) and above VP when it has narrow scope (and excludes the subject from its scope): on this scenario, 'Doggy not barking' might mean 'The doggy is not barking' and 'Not doggy barking' might mean 'There is no doggy barking'.

[32] It may be that early child utterances like *Wet diaper* and *Off shoe* (perhaps even *Bye-bye car*) can also be analysed as predications involving an unaccusative predicate with a single (object) argument.

[33] She also produces structures in which verbs are merged with prepositional or adverbial particles (e.g. *Sit down*, *Stand up*, *Walking around*, *Try again*), but these are of no immediate relevance to the present discussion.

[34] For example, the preposition required to indirectly θ-mark the complement of *depend* is *on* in English, but the counterpart of *by* in Italian and *of* in French.

[35] An interesting question which arises here is what is the mechanism by which arguments are θ-marked – a question which Chomsky does not give a definitive answer to. If θ-roles are described in terms of θ-role features, one possibility is that verbs carry valued θ-features and nominals carry unvalued θ-features, with merger resulting in the valuing of the unvalued θ-feature carried by the nominal. Difficult questions arise, but these are set aside here.

[36] It may be that this light-verb surfaces in the overt form *do* in structures like *Drive a truck I would never do*.

[37] It is obviously difficult to determine whether they carry (singular) number, or whether *man/truck* are numberless forms.

[38] An issue left open here is whether or not there is an abstract Tense node projected in the syntax at this stage.

[39] There seems no reason in principle to think that the null noun could not carry number features, but since these will always be invisible, this cannot

be empirically substantiated in any straightforward fashion.

[40] In adult English, the possessor is assigned structural genitive case via agreement with a superordinate null D and raises to spec-DP in order to erase the EPP-feature of D (See Radford 2000).

[41] The same point can be made in relation to progressive participles in structures such as She *is always **teasing me,** always has ∅, and always will ∅.*

[42] One potential exception to the claim that all heads carry interpretable features may be so-called genitive *of* in structures like *the capital of Italy*. This seems to behave like a preposition with regard to pied-piping (cf. *Which country is Rome the capital of?/Of which county is Rome the capital?*) and hence appears to be a syntactic head. However, it seems to have no substantive content of its own. If dummy *of* structures are an imperfection, we can account for the fact that one-year-old children say *picture Mummy* rather than *a picture of Mummy* by positing that children initially produce perfect structures. See the relevant discussion in §13.

[43] See Felser (1999) for discussion of the syntax of Aspect in adult English..

[44] On this view, a plural count noun like *towers* in a structure like *build towers* in adult English would contain a null partitive quantifier with an interpretable number feature which values and erases the unvalued and uninterpretable number feature of *towers*.

[45] If number is only optionally encoded as a formal feature of nouns at a certain stage, forms like *tower* would be ambiguous between a *singular* use and a *numberless* use: we would expect numberless nouns to be used in singular and plural contexts alike (with number only being projected where it cannot be determined from the context).

[46] In the sense that the noun is not premodified by an article like *a/the*. I have excluded possessive nominals like *Mommy shoe* from the count; these systematically lack the `*s* inflection required in adult English.

[47] More accurately, Jonathan *rarely* marks uninterpretable number features on quantified nouns (e.g. only in 2/19 structures of the form *two+noun*).

[48] The same point could be made in relation to an item like *niente* 'nothing' in Standard Italian.

[49] In standard varieties, the negative feature carried by *nothing* is always interpretable.

[50] An alternative possibility is to posit that number is always an uninterpretable feature on nouns once quantifiers are acquired, so that bare nouns like *socks* in *Socks on* are QPs headed by a null quantifier [Q ∅] that carries an interpretable plural-number feature which values and erases the unvalued and uninterpretable number feature on *socks*. However, this would require us to develop a different account of the number-marking asymmetry between bare and unquantified nouns noted in the text (i.e. the fact that bare nouns are marked for number but quantified nouns generally are not).

[51] Although *a* does not seem to function as a quantifier in predicate nominals, it does carry an interpretable number feature since there is a clear semantic distinction between saying e.g. *Blur and Oasis are groups* and *Blur and Oasis are a group.*

[52] This assumption raises interesting questions about learning and unlearning, but I will not pursue these here.

[53] Proposals made by Nancy Budwig (1995) might be interpreted in this light, though they are very different in nature and substance from the suggestion made here.

[54] If Lebeaux's (1987, p.36) observation that children's initial case-marking of subjects 'differs with the semantics of the verb' is correct, it suggests that subjects at the relevant stage are assigned inherent case. I take inherent case to be assigned and erased under θ-marking, and structural case to be assigned and erased under agreement.