*Child Null Subjects**

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Abstract

It has often been observed that children go through a stage in their language development where they omit subjects. This occurs in children learning both *pro*-drop and non-*pro*-drop languages and poses questions for a traditional parameter-based theory of language acquisition. In this paper I give an overview of some of the existing accounts of this phenomenon, considering the patterns that emerge and the problems that each account faces. I look at both competence-based and performance-based approaches, before suggesting that we might gain new insight by integrating the existing data and findings using the pragmatic framework of Relevance Theory.

1 Introduction to the data

English is a non-null subject language. It differs from languages such as Spanish, Italian and Chinese by the fact that each finite clause must have an overt subject.[1] In Italian, for example, (1) is fully grammatical, whilst its English counterpart (2) is not.

(1) Lavorano molto in questa città.
'(they) work a lot in the city'

(2) * work a lot in the city. (Hyams and Wexler 1993)

Within the Principles and Parameters framework this difference is seen as a result of the two languages having a different setting for the null subject parameter.[2] However, it has been widely observed that children, no matter which type of language they are learning, go through a phase in their language acquisition where they produce finite sentences that lack subjects. Sentences with overt subjects alternate with their subjectless counterparts throughout this phase in development. This stage typically occurs from around 20 to 25 months, although exact timings

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[1] In all languages non-finite clauses may lack an overt subject. For example: John tried [PRO to escape].

[2] In this introduction I do not go into detail concerning the two types of null subject languages: Italian style *pro*-drop and Chinese style Topic-drop. This distinction is dealt with in greater depth in later sections.

vary from child to child. The following examples are taken from Hyams (1986) quoting from the corpora of Bloom (1970) and Bloom, Lightbrown and Hood (1975).

(3)

want more apples	I want doggie
missing there	I find it
ride truck	Gia ride bike
bump my train	I make tunnel
want go get it	I want take this off
read bear book	Kathryn read this

The following data exemplifies the phenomenon in some other non-null subject languages:

(4) French (Hamann, Rizzi and Frauenfelder 1996)
a tout tout tout mangé
'has all all all eaten'

(5) Danish (Hamann and Plunkett 1997, 1998)
er ikke synd
'is not a pity'
ikke køre traktor
'not drive tractor'

Following the Very Early Parameter setting hypothesis outlined by Wexler (1998), this is unexpected in the speech of children who are acquiring a non-null subject language. We need an explanation for the occurrence of such sentences.

Much has been written on the subject and the existing approaches fall into two distinct camps: competence, (grammatical) accounts and performance based accounts. The competence approach starts from the assumption that during the relevant phase in development children possess a grammar that allows null subjects. They are, therefore, producing utterances that are fully grammatical for them. At some point this grammar switches or changes in some way to come into line with the non-null subject quality of their mother tongue. According to performance accounts, the child is acquiring the target language grammar from the start, and the dropping of subjects is due to some form of processing constraint or pragmatic consideration. In section 2 I give an overview of some previously suggested grammatical-based accounts and highlight the problems with them. In section 3 I will argue that a performance based account is more appropriate, before outlining some such accounts and proposing that a Relevance Theory based approach may offer new insight into the phenomenon.

2 Grammatical approaches.
2.1 *Pro* hypothesis

Hyams (1986) argues that the child's early grammar differs from the adult grammar in that it has the *pro*-drop parameter positively set. She suggests that the *pro*-drop setting is, in fact, the initial state of this particular parameter and that children learning English produce these subjectless sentences up until the point when the parameter is reset from its initial setting to the target language's negative setting. Hyams gives an outline of the kind of evidence the child would need in order to make this change. In her view, if the child hears a well-formed sentence of English that it is unable to generate with its current *pro*-drop grammar, then this is a piece of positive evidence, and should be enough to trigger the switch. She claims that such evidence would be provided by the use of expletives. Given the Avoid Pronoun Principle,[3] a language in which subjects are optional would always avoid the use of expletives. Therefore, their presence in the input to the English-speaking child tells it that overt subjects are obligatory in subject position in the target language. According to Hyams the use by the child of expletives and the abandonment of subjectless sentences coincide in language development, and she concludes that these are, indeed, the trigger we are looking for. We can, therefore, see how Hyams attempts to assimilate the child null subject with the null subject in languages such as Italian and Spanish, and how she accounts for the switch in the child's grammar.

However, the *pro*-drop analysis finds itself faced with many objections. In a later article (1992), Hyams herself points out the empirical, conceptual and logical problems with the account, and Valian (1990) uses experimental data to show that its predictions are not borne out. The most striking objection is the structural differences that we find between the distribution of the child null subject and *pro*. If the child in this stage of development has its parameter set to *pro*-drop, then we would expect to find the null subjects occurring in the same environments as in adult *pro*-drop languages. According to Rizzi (2002) the child null subject is found very rarely, if at all, in subordinate clauses. In true *pro*-drop languages such as Italian, this is a licit environment for *pro* to occur. For example, sentences such as (6) are perfectly acceptable in Italian and are found in the speech of both adults and children, but equivalent sentences, for example (7), are unattested in child English:

(6) Ho detto che __ andava a casa.
(7) *I said that __ went home. (Hyams 1996)

[3] See Hyams (1986) for more detail on the Avoid Pronoun Principle.

As Rizzi (1994) points out, this evidence may be less significant than it appears, since children do not begin to properly produce subordinate clauses until their mean length of utterance (MLU) has gone beyond that usually associated with the null subject phase. However, he goes on to give examples such as (8) of occasional utterances of this sort that have been attested in this phase:

(8) _____ know what I maked.

In examples such as this, the subject in the main clause, but not the subordinate clause, is omitted. Rizzi cites this as evidence that null subjects are restricted to main clauses, whilst acknowledging the need for further investigation.

Empirically, then, it seems that we are dealing with a different phenomenon from adult *pro*-drop in the early language examples. As noted above, all children drop subjects. If this is because all children in this phase have the same, *pro*-drop, grammar then we would expect the ratio of overt to null subjects to be constant cross-linguistically. Valian (1990) conducts a survey that reveals that American children learning English produce at least twice as many overt subjects as Italian children. This suggests that the null subjects in the two different types of languages have different causes.

Conceptually, the idea of a mis-set parameter is troublesome. There is no evidence of this occurring with other parameters such as the head first/ head last parameter and, indeed, evidence rather suggests that parameters are set very early on in the child's language development (Wexler 1998). Logically, too, we see problems with Hyams' approach. Valian (1990) addresses the problems inherent in positing a single value default parameter. If the parameter has a default setting then the question is how the child learns to reset it. If, as Hyams suggests, the default for *pro*-drop is a positive setting, then the presence of sentences with subjects is not enough to prove this initial setting wrong. Sentences with subjects occur in null subject languages also. A null subject language simply has the option of omitting subjects. Therefore, the set of sentences with overt subjects forms a subset of the null subject language's possible sentences. Hearing sentences with subjects cannot be enough to prove that subjects are obligatory. Logically, the possibility remains that there is an additional set of subjectless sentences that the child has just not heard yet. There is also the added complication that a child learning English is likely to hear subjectless sentences as part of the input. Subjects may at times remain non-overt in sentences of casual spoken English such as (9) and (10), and yet according to this theory the children still switch grammars:

(9) looks like rain
(10) feel exhausted today.

Of course, we have Hyams' appeal to expletive use, which is specific to non-null-subject languages. However, this too may be problematic. If the child's grammar is parametrically set to *pro*-drop then it will produce no representation for the expletives the child hears and they will in effect be unanalysable and, therefore, filtered out. Alternatively, Valian suggests the child may try to assign a referential interpretation to any expletive pronouns they hear [4].

2.2 A modified *pro* hypothesis

In Hyams (1992) the author herself outlines some problems with her earlier analysis[5] and adjusts it in line with the Morphological Uniformity approach to null subjects given by Jaeggli and Safir (1989). According to this modified account the null subjects are licensed by the morphological uniformity of the language's inflectional system. In this way, the early child grammar of English is seen as equivalent to that of Chinese. Hyams' account predicts that the abandonment of null subjects and the consistent production of inflection will coincide; a prediction that she claims is confirmed by the data. Although this account solves the problems which Hyams herself identified with her 1986 approach, many of our previous objections remain.

2.3 VP hypothesis

Valian (1990) also uses her data to test the predictions of an alternative grammatical approach to the phenomenon of child null subjects. Guilfoyle (1984), Guilfoyle & Noonan (1989) and Kazman (1988) set out an analysis where the child's immature grammar consists only of a VP, with no Inflectional phrase or Complementizer phrase. In the mature, adult grammar the need to check case means that the Spec of VP must be filled with an NP that can move to become the subject of the INFL phase. However, in the child's grammar this is not necessary and so the position of Spec-VP where the subject usually sits may remain optionally empty. This account predicts that the child in the null subject phase will also display an absence of tense, modals and nominative case marking. It is these predictions that Valian tests and finds to be false. The children consistently used nominative case forms for NPs in subject position but not for NPs in object position, and whilst the American and Italian children's data overall contained few

[4] Empirical data is also problematic for Hyams' appeal to expletive use. Although overall frequency of sentences with expletives was low, Valian (1990) found instances of their use across the age and MLU range she studied. This included children who were still firmly in the null subject stage.

[5] Although she addresses certain problems, she does not cover all of the objections given in section 2.1.

modals, she found no correlation between the onset of modal use and the loss of the subjectless option. Valian notes that the predictions of the VP hypothesis hold true for the very youngest child in her data set, with the lowest MLU. She therefore entertains the possibility that at this very early stage the child does indeed have a VP grammar. However, the use of subjectless sentences persists well past this stage and so another or further explanation is needed for this later data.

2.4 Topic drop

Languages such as Chinese allow null subjects whilst remaining inflectionally impoverished. In these cases the parameter in question is not the *pro*-drop but the topic-drop parameter. Along with the difference in inflectional paradigm, topic-drop languages differ from *pro*-drop languages in allowing the omission of objects as frequently as the omission of subjects.[6] Like *pro*-drop, topic-drop has also been used to account for the child null subject phenomenon; one such account is outlined by Hyams and Wexler (1993) and supported by Bromberg and Wexler (1995). Chinese-speaking children drop subjects in the same way as their topic-drop mother tongue allows. Furthermore, Hyams and Wexler (1993) note that in some non-null subject languages, for example, Dutch, any constituent may be topicalised and hence appear in first position: [Spec CP]. In certain pragmatic circumstances these topics may then be dropped, as in part (b) of the following exchange where the name of the film in question, Rainman, might be seen as topicalised and then dropped.

(11) a. Ga je mee naar Rainman vanavond?
'Go you to Rainman tonight?'
b. Heb ik al gezien.
'Have I already seen.'

The topic-drop theories hypothesise that the missing early English subjects are due to the same process we see operating in the examples above. Bromberg and Wexler (1995) consider whether adult English displays instances of topic drop and offer exchanges such as the following as tentative examples:

(12) a. What happened to Mary?
b. ___ went away for a while.[7]

[6] See Huang (1984) for a detailed account of the two different parameters, *pro*-drop and topic drop, and the resulting typology of languages.

[7] Previous work shows that spoken examples such as these may follow separate distributional patterns to the child null subjects, which more closely pattern with adult written forms.

Movement of a constituent to topic position is a commonly attested phenomenon in English, with examples such as (13):

(13) a. John, I spoke to yesterday.
b. $_{CP}$ [John$_i$ [I spoke to t_i yesterday]]

And whilst we do not see non-overt topicalised constituents such as are found in Portuguese (14), English does use null operators under certain conditions, as in (15):

(14) A Juana viu – na televisao a noite
Juana saw on television last night
'Juana saw him/her/it on television last night'
$_{CP}$[TOP$_i$ $_{IP}$[a Juana viu ti na televisao ontema noite.]]
(Rizzi 1986:513)

(15) [I need a friend [OP$_i$ [I can rely on t_i]]]

Bromberg and Wexler claim that there is a lack of null subjects in utterances with *wh*-preposing and they present this as further support for the Topic-drop analysis.[8] As topics and *wh*-words target the same tree node in the syntactic structure, they cannot co-occur in the same sentence, and so if the absent nulls are topics then we should expect to find no *wh*-questions amongst our null subject data.[9] However, various questions remain unanswered if we adopt a purely topic-drop account, and there are substantial problems with the account in general.

In languages such as Portuguese, objects may be topicalised as often as, if not more often than, subjects. However, the rate of object drop in child English is very low. Hyams and Wexler attempt to address this problem by adding to the analysis a condition that, in order to be dropped, a constituent must be scoped outside the VP. In English this means that the subject, but never the object, will fall within range and be a target for dropping. However, in a V2 language such as Dutch, where any constituent may be topicalised, objects may be dropped from this initial position. This fits with the empirical data.

Furthermore, the topic-drop accounts give no explanation for why the maturing speaker loses the option to use the topic-drop construction that they so freely used as a developing child. Indeed, Hyams and Wexler acknowledge, in a footnote, that their analysis does not address either this issue or the issue of how the phenomenon

[8] See section 2.5 below for further discussion of the distribution of null subjects with *wh*-preposing.

[9] It has been argued that the CP may be made up of several separate projections, and if this is the case then topics and *wh*-words may co-occur. See Reinhart (1981) and Rizzi 1997.

relates to the adult language in general. This seems to be a major failing for a theory of child language and leaves as many questions unanswered as it addresses.

2.5 Truncation

The so-called Truncation account of the child null subject is developed by Rizzi (1994) and is followed in the analysis of adult English subject drop by Haegeman (2000). It takes as highly significant the distributional finding that null subjects in embedded positions are very rarely, if at all, attested during the null subject phase. Rizzi concludes that the phenomenon is, therefore, structurally restricted to the root position. He notes that the child is producing an empty category that does not have an antecedent. This in itself is problematic. Empty categories are subject to the Empty Category Principle (ECP) (16)[10] and specifically, in this case, to the second clause of the principle:

(16) i. Formal licensing: An empty category must be governed by an appropriate head.
ii. Identification: An empty category must be chain-connected to an antecedent.

Following the Principles and Parameters framework, this principle should be innate and, as such, should constrain the child's use of language from the outset. If the null subjects are taken to be antecedentless empty categories, then the second clause of the principle seems not to be satisfied and the sentences should not be licit, even in the child's developing grammar. Rizzi looks to the distributional qualities of the null subject, and more specifically the lack of cases in embedded positions, in order to make a modification to the identification clause of the ECP. He proposes, following and extending Chomsky (1986) that (16) should be replaced with (17):

(17) An empty category must be chain connected to an antecedent *if it can be.*

Thus, if the empty category is in the highest position in the structure and there is, therefore, nowhere for an antecedent to sit, then the need for the antecedent is waived, and, instead, identification takes place via the discourse. He then proposes that, in the child's grammar, the empty category is indeed in the highest position because the child fails to obligatorily project to the CP level. When a CP is not projected, null subjects are licensed via (17). In sum, the child's grammar is

[10] As defined in Rizzi (1986).

missing the rule in (18) and until this is acquired as an obligatory condition, via a maturation process, null subjects may occur.

(18) ROOT = CP

This account clearly predicts the absence of null subjects in sentences where *wh*-movement has taken place. In order for *wh*-preposing to take place, a CP level must be projected and therefore a potential antecedent site will be available and, according to (17), must be used. Rizzi claims that this is indeed the case and that child null subjects and *wh*-preposing do not co-occur. However, Bromberg and Wexler (1995) present data from the CHILDES database (MacWhinney 2000) which contradicts this. They find that 'null subjects are abundantly present in *wh*-questions,' citing minimal pairs such as (19) and (20) as evidence:

(19) Where go?
(20) Where dis go?

So again we find ourselves with a grammatical, competence-based account which, whilst dealing with certain aspects of the phenomena, is left wanting when further data is considered.

2.6 Summary

As I hope to have shown, the various grammatical approaches each goes some way to offering an account of the data, but none is without its problems. Competence accounts also face more general objections. For example, the speech of children in the null subject phase tends to omit other elements, apart from the subjects addressed by the parameter-style approaches. Articles, prepositions, auxiliaries and determiners are amongst the categories identified as also being commonly omitted during this stage in development. Paul Bloom (1990) gives the following examples of the sentences which a child in this phase might produce:

(21) I put
put book
put table
book table
I put table

None of the grammatical accounts considered above gives any explanation of why this variety of omissions should occur and, as Paul Bloom states in his 1993 reply to the arguments put forward in Hyams and Wexler (1993), 'no one has proposed a

parameter of subject-determiner drop.' (Bloom 1993, p. 727.) So instead of simply asking, as the competence theorist does, 'why does the child drop subjects?' I believe that we may gain more insight by breaking the issue down into two separate, but related questions:

(22) a. Why does the child's speech frequently involve omissions?
b. By what process does the child 'select' the items to omit?

If grammatical approaches alone fail to offer comprehensive answers to these questions, perhaps an alternative approach is needed. In the next section I outline just such an approach, which focuses on the child's performance rather than their competence.

3. Performance accounts

3.1 The competence/performance distinction

The distinction between the roles of competence and performance in language production and processing was first highlighted by the work of Noam Chomsky (1965). Fundamentally, the difference is between our knowledge of language (competence) and our practical use of language in day-to-day conversation (performance). By the time we reach linguistic maturity, we have acquired a grammar that can not only interpret and produce utterances in the known language, but can also provide judgements of well-formedness for sentences and possible sentences which we might never have heard before. However, this is not the whole story concerning our adult use of language. There are many external factors which may affect our ability to utilize this internal grammar on a day-to-day basis. Some of these 'performance' factors vary across times and situations. For example, we may make more 'mistakes' or be more prone to slips of the tongue when we are tired, drunk or nervous. These errors do not reflect some deficit in our underlying grammatical competence or knowledge of our native tongue, but are on-line glitches in production. There are also some performance factors which affect or constrain our linguistic output more generally and consistently. Language is recursive, and, a grammar is, in theory, able to generate indefinitely long sentences. However, our working memory places limitations on how much information can be kept active at any one time for use in computations, and output, correspondingly, finds itself with practical length restrictions. Similarly, we have difficulty processing certain structures, such as multiple embeddings, so that sentences such as (23) or (24) below, which are perfectly well-formed sentences according to the grammar, are not able to be processed by our performance systems, at least not without considerable conscious effort:

(23) Bricks bricks break break bricks (personal communication)
(24) The dog the stick the fire burned beat bit the cat. (Pinker 1994)

The approaches I will discuss below look to this performance aspect of our production and comprehension of language to shed some light on the child null subject phenomenon.

3.2 A performance approach

The alternative to accounting for the child null subject phenomenon as a reflection of the developing grammatical system is, instead, to look to issues of performance. On these approaches, the child's grammar is not different to that of the adult, but, rather, factors relating to the child's ability in production influence the output. Lois Bloom (1970) offers support for a performance approach, by providing evidence that the child knows more about the adult grammar than it is able to produce in its own utterances. She reports the results of an experiment by Shipley, Smith and Gleitman (1969) which reveals that children, including those in the 'telegraphic' phase, respond more readily to full, well-formed commands than they do to commands expressed in a telegraphic style similar to the utterances they themselves produce. This suggests that the children know more about their language, its rules and structuring, than is superficially evident from the utterances that they produce. There is both further empirical and conceptual evidence that children represent the same linguistic rules and principles as the adults around them (Bloom 1989; Chomsky 1986; Hyams 1986; Pinker 1984), and that the explanation does not lie at the competence level.

If this is accepted, then we are left looking towards performance and production factors in order to explain the subjectless sentences in child English. Indeed, many of the competence-based accounts acknowledge at least some role played by pragmatic and performance factors. Hyams and Wexler (1993, p452) note that, 'It is a trivial observation that children are limited in their productive abilities', whilst for Rizzi (2002, p24) language is, 'grammatically based, but performance driven'. Even in accounts that do not explicitly acknowledge the role of performance factors, there is evidence that there are exceptions to the grammatical rules or patterns. For example, Hyams and Wexler (1993, p.428) explain the subject/object asymmetry via a grammatical model in which 'the option to drop a specific argument is available only for subjects'. Yet their own data reveals instances of object drop, albeit at a much lower rate than subject drop. Similarly, Hyams (1996) argues that her data support her approach as they reveal that modals occur 'almost exclusively' with overt subjects, the percentage ranging from 94-99%. How are the 1-6% of exceptions to be dealt with in these cases, if not in terms of performance? The grammatical accounts considered above deal for the most part in absolutes. A

certain utterance is or is not well-formed according to a particular grammar. Such accounts, in some sense, abstract away from practical production and comprehension considerations. As Paul Bloom (1990) points out, performance accounts deal with a 'tendency' rather than an absolute, and as such, in my opinion, account for the data in a more appropriate manner. Several authors have, in fact, put forward accounts which place a much greater emphasis on performance aspects and see these as lying at the root of the null subject phase in child language.

3.3 Processing or pragmatics?

The performance based accounts divide into two main approaches. The first set that I will examine focuses on the processing limitations in the developing child. In these accounts, the omissions in production occur because the child's capabilities are overloaded. Some form of constraint on processing ability in the developing stage, combined with complexity in certain sentences, leads to the reductions. I will give an overview of the earliest of these accounts as proposed by Lois Bloom, which focuses on the complexity added by extra sentential length, before moving on to look at other accounts which focus on issues such as VP length and metrical complexity.

Alternative accounts approach the issue from a pragmatic perspective. In these theories, the child omits the constituents which are most easily inferred from the context. Greenfield and Smith (1976) offer just such an account. Both the processing and the pragmatic accounts acknowledge, to varying extents, the importance of the other in the overall process. However, none of the accounts offers a fully integrated approach. I hope to take elements of both and combine them using the Relevance Theoretic framework to offer a comprehensive alternative account.[11]

3.4 Processing accounts

3.4.1 Sentential complexity. The earliest 'performance' account is that of Lois Bloom (1970), who analyses the speech of three children in the null subject phase and looks to sentential length and complexity to account for the omissions in production. Bloom categorises the speech of the children as 'telegraphic' (p.139), likening it to the utterances produced by an adult 'who is under pressure to be brief' (p.139). So what is the nature of this pressure on the child which results in the 'telegraphic' output? According to Bloom's data, it is the length and, more specifically, the complexity of the utterance. Between the ages of 20-23 months the

[11] I hope to eventually consider issues such as the child's pragmatic, linguistic and mind-reading abilities at this stage, and perhaps to draw conclusions concerning the role and nature of the omitted material and the process by which its content is identified.

child is more or less limited to two word utterances. Where a longer utterance would have been required by the adult grammar, the child omits one or more of the words. Initially, this may seem to suggest a simple constraint on length. However, Bloom suggests that what is at work here is rather a 'cognitive limitation in handling structural complexity' (1970, p165), which surfaces as an apparent length limitation.[12] For example, Bloom works from the hypothesis that negation increases complexity, and she gives an in-depth analysis of its use in the speech of children during the telegraphic phase. She finds that, in sentences with negation, the probability that some part will be reduced is increased, which supports the claim that complexity leads to omissions.

Under Bloom's account, then, the omissions are due to a limitation on the sentential complexity with which the developing child can cope, with the result that, 'something had to give in its production' (1970, p165). Whereas the grammatical accounts outlined above concentrated on the omission of subjects, Bloom's account, which appeals to processing limitations, considers the overall reduced nature of the speech of children during this phase, and the evidence that subjects are not the only elements which 'give' under pressure. Bloom follows the conclusions drawn from previously conducted experiments (Brown and Bellugi 1964, Brown and Fraser 1963) to claim that the omissions from the child's speech are predictable and systematic, and that they are, indeed, operating under some form of constraint. Both Bloom (1970) and Brown (1973) make generalizations regarding the omitted material, categorising the words that are retained in the surface utterances as being 'contentives' and those that are omitted as being 'functors.' The group of contentives, which contains nouns, verbs and, to some extent, adjectives, contains lexical information, whilst the 'functors' are made up of grammatical elements such as inflection, articles and auxiliary verbs. Functors also tend to be unstressed and in section 3.4.3 we will see prosody as a performance factor in the processing account put forward by Gerken (1991). This distinction between 'substantive, lexical items,' and 'grammatical formatives' (1970, p140) provides Bloom with a guide to which elements are most vulnerable to omission in this constrained stage of language development.

Bloom goes on to give further details of the nature of the constraint. She describes both linguistic and cognitive factors and shows how they might interact to determine which constituents are omitted in the child's production and which are not. Whilst a linguistic factor such as unfamiliar vocabulary or a logical complexity such as negation may constrain the child's ability, Bloom also posits cognitive constraints, such as reduced memory span, which make the child's task still more complicated. Olson (1973) considers the relation between memory and language

[12] This point goes some way to addressing the objection that children sometimes produce long sentences. It is not length per se that is causing the processing overload, but the complexity of the sentence.

acquisition in more detail. Rather than seeing the child's limited memory span as the underlying reason for the shorter utterances, he presents both phenomena as symptoms of the same process. He argues that it is the child's as yet under-developed abilities to 'recode, encode, to plan and monitor, to integrate and unitize' (p153) which underlie both limitations.[13] In terms of accounting for which elements are vulnerable to omission in this constrained stage, Bloom returns to the distinction between 'substantive, lexical items,' and 'grammatical formatives.' (1970, p140) She claims that the latter tend to be weakly stressed and to carry the most predictable information, and are therefore the most commonly dropped items. Bloom does not specifically address the issue of subject-drop, and we must ask ourselves on which side of the lexical-grammatical divide the missing child subject would fall. Bloom seems to be making some kind of a move towards incorporating pragmatic factors into her processing-based account. Her suggestion that the words that the child produces, 'carry the most information and are least predictable,' feels intuitively attractive and I hope to take some of her ideas and consider them further within a more developed pragmatic framework.

3.4.2 Rightward complexity – a variation of Bloom's account. Paul Bloom (1990) adapts the performance account presented by L. Bloom (1970) and presents results from a further study in its support, focusing on the structure of the sentence in order to explain the data. He cites three strands of empirical evidence which favour a processing account over a grammatical approach. Firstly, like Lois Bloom, he considers the evidence that various different types of constituent are omitted alongside subjects during this phase. He uses evidence from the experiments of Brown and Fraser (1963) to show that the omissions show up in imitated speech to the same degree as they do during spontaneous speech. This suggests that, rather than a grammatical problem or difference being at the root of the subjectless sentence construction, the child is instead limited in some way as to what they are able to produce. Finally, he reports data from Mazuka et al (1986), which reveals that some children reduce their subjects to a schwa, rather than omitting them altogether. This data is hard to explain under a competence account where the child's grammar allows null subjects, but it supports a performance account where the child knows a subject is necessary but lacks the necessary resources to consistently realise it phonetically.

Paul Bloom takes Lois Bloom's theory about the significance of sentence length and tests it with specific attention to VP length.[14] By counting the number of words

[13] Olson also considers the child's 'highly egocentric' (p.155) view of the world as a factor contributing to the frequency of abbreviated utterances.

[14] It is a trivial observation that sentences with subjects will be longer than those without, as the subject adds another word to the utterance length. For example, 'see mummy,' will be counted as two words, whilst 'I see mummy' will count as a three word utterance.

from the verb position to the end of the sentence, Bloom confirms the predictions of the performance-based account. There was a significant difference in VP length between sentences with a subject and those without. When a subject was overtly present, the VP tended to be shorter than when it was absent. As Bloom himself points out, there is an alternative way of accounting for this relationship. If the omission of subjects is explainable by purely pragmatic factors, then it may be that the extra length in the VPs is likely to provide extra contextual information which makes the subject referent more easily inferred, and therefore more likely to be omitted. Bloom tests the predictions of such a pragmatic account against the processing approach by analysing the relative length of overt subjects produced by children in this stage against the VP length of the sentences in which they occur. Whilst a pragmatic account (as he envisages it) predicts that the length of the overt subjects should have no effect on the VP length, the processing account predicts that the extra effort involved in processing a complex subject will result in a shorter VP than for a simple subject.[15] Bloom found that his hypothesis was confirmed.

Bloom claims that a purely pragmatic, discourse orientated story could not account for the phenomenon. He quotes findings from Goldin-Meadow and Mylander (1984) which suggest that the likelihood of the omission of a particular element cannot be predicted by whether it encodes old or new information. However, he does suggest that maybe such facts could underlie the observed object/subject asymmetry. Objects are more likely to convey 'new' information, as compared with subjects, which are more likely to convey 'given' information. He puts forward the possibility that the given subjects are more likely to fall prey to the processing restriction. Alongside this suggestion, Bloom also provides an alternative, more processing-based account of the asymmetry. He claims that there is a general linguistic bias to 'save the heaviest for last' (p. 501), resulting from the assumption that processing load is 'proportional to the number of yet-to-be expanded nodes' (p. 501) in the syntactic representation. Therefore, subjects, at the left-hand side, carry the most unexpanded nodes along with them and impose the largest processing load. As a consequence, subjects are omitted more frequently than the right-hand objects.

In his conclusion, Bloom notes that his processing account is not logically incompatible with the more competence-based misset parameter accounts. However, he does point out that a performance approach explains a lot of the data which otherwise made a grammatical account seem necessary and that, therefore, much of the reason for positing a competence account in the first place is lost. In the light of the performance approach, problems posed by the grammatical accounts, such as the need to acknowledge a certain level of linguistic

[15] As children in this range rarely produce complex subjects, in practice, Bloom compared the use of the unambiguous pronouns 'I' and 'You' with non-pronoun subjects.

sophistication in the child, and the issue of how the grammar changes, are substantial drawbacks considering the reduced benefit of such a hypothesis.

3.4.3 A metrical approach. Taking a slightly different angle on the phenomenon in her 1991 article, LouAnn Gerken outlines the problems with the competence-based accounts. She also assesses a variety of performance approaches, but concludes that they all fail to capture the generalization that the omitted elements would tend to be weakly stressed if they were overtly realised. She presents an alternative analysis based on the hypothesis that children tend to 'omit the weak syllables from iambic feet' (p437). Her approach draws on evidence that children are more likely to omit a weak syllable from the start of a word than from a word final position. Both 'Giraffe' and 'Monkey' are two syllable words. 'Giraffe' has the main stress on the second syllable, whereas in 'monkey' the main stress comes first. It is much more likely that we will find 'giraffe' being reduced to 'raffe' than 'monkey' being reduced to 'mon'. Gerken claims that this tendency surfaces at sentence level as well as with individual words.

In her conclusion, Gerken places her account firmly in the processing limitation camp, claiming that the metrical hypothesis 'provides a mechanism by which some sentential elements are omitted when sentential complexity becomes too great' (p443). She goes on to suggest that the hypothesis may also provide 'a measure of the sentence complexity itself,' as sentences with pronoun objects differ in metrical complexity from those with lexical NP objects. Gerken's account would, therefore, seem to satisfy many of our requirements for a comprehensive analysis of the phenomenon. It can account for the object/subject asymmetry, it appears to be supported by experimental data, it accounts for at least one aspect of the complexity which presents problems for the child, and it offers a systematic mechanism for reducing the processing requirements. However, on closer inspection Gerken's account too faces problems. Hamann and Plunkett (1998) point out that, although the approach works well for the English data, it does not hold cross-linguistically. For example, in French both subject and object pronouns are clitics which usually occur before the finite verb. During development null object clitics are found in both trochaic and iambic feet. They also point out that Gerken's account predicts that the sentence and word level omissions will occur at the same stage in development. They present evidence from Danish showing that this is not necessarily true cross-linguistically.

3.5 Testing the predictions

We have seen how Lois Bloom (1970) outlined a pattern of sentential complexity which produces omissions in the output due to limitations of the developing child's processing abilities, and how Paul Bloom offers an account based on verb length as

a specific component of sentential complexity; and I have also outlined further evidence in support of such an approach. Paul Bloom (1990) and Valian, Hoeffner and Aubry (1996) take this further, considering and testing out specific predictions made by processing accounts as opposed to the grammatical accounts outlined in sections 1 and 2.

Valian, Hoeffner and Aubry (1996) used data from two groups of children: one inside the MLU range associated with null subjects, and one outside. They tested a hypothesis based on limited performance systems against some of the competence based approaches we have seen above. They found that all the predictions of their performance-deficit hypothesis were confirmed. For example, they predicted that if the presence of a topic contributed to a lower use of subjects, then it would do so in both MLU groups, and that, if expletives were produced less often than referential pronouns, again, the effects would be equivalent across both groups. This was exactly what the results of their analysis confirmed. The Topic and *pro*-based accounts that we saw earlier would predict differential results across the two groups, as under their analysis the two groups represented two different grammars. The authors conclude that the two groups have the same competence, and that even the very young, very low MLU children understood that English requires subjects. Like P. Bloom they found a correlation between subject use and both sentence length and VP length, and, therefore, they claim that a performance account explains the data more comprehensively than the grammatical accounts.

3.6 A pragmatic approach

As independent approaches, pragmatic accounts are far less developed than their processing-focused cousins. Most of the processing theorists acknowledge at least some role for pragmatics. Paul Bloom (1993) suggests that, whilst processing limitations affect the child's ability to perform, the children 'also have some control over what to omit', and that they choose to omit 'pragmatically redundant material' (p. 726). However, this suggestion is not developed much further, and the emphasis in the accounts remains firmly placed on processing load as the most significant factor.

Greenfield and Smith (1976) offer a pragmatic perspective on the null subject developmental stage. They base their approach on the notion of informativeness,[16] proposing that the most uncertain or most informative elements in the context are linguistically encoded, whilst less informationally rich elements are omitted. They stress that this notion of uncertainty is assessed in relation to the child producing the utterance and not from the point of view of the listener, although very often the

[16] Greenfield and Smith claim to be using the term 'informativeness' in 'the information-theory sense of uncertainty' (p. 184) and, whilst they refer to the work of Grice, they do not seem to be referring to his maxim of informativeness.

two perspectives will converge on the same elements. This approach, they claim, explains why subjects are so frequently dropped. The agent in subject position is the most obvious of the 'situational elements that can be taken for granted' (p108). Their theory is based on a study of several children's speech, and their data reveal that subjects are 'expressed infrequently,' especially in the case of sentences in which the children are referring to themselves, and in single word utterances. They claim that the AGENT concept is only overtly expressed in contexts where there is some uncertainty about the referent, such as a change, or conflict between one or more agents. Greenfield and Smith summarise by proposing a 'pragmatic presupposition' that whatever the child can assume or take for granted is not overtly expressed. They go on to draw parallels between this stage in the child's language development and what they call 'telegraphic ellipsis' in adult conversation, claiming that the child is acquiring the ability to combine linguistic and non-linguistic information.

There are, of course, problems with this account. Whilst it provides an overview of one possible way in which the child selects[17] which items are to be omitted and which are to be overtly expressed, it does not explain why such omission is necessary. Greenfield and Smith's approach deals with one-word utterances and is not specifically focused on subjectless sentences. As a result, their explanations concerning issues such as the subject/object asymmetry are sketchy. They comment that the child may 'be egocentric in taking more elements of his own perspective for granted,' (p195) suggesting that, therefore, a preference for subject omission is likely.

However, despite these problems, I feel that Greenfield and Smith offer us an important perspective on the data. I hope to show that a development of their ideas, together with the evidence on processing limitations outlined above, can combine within the Relevance Theoretic framework to produce a fuller and more insightful account.

4 A Relevance Theoretic re-analysis

4.1 Introduction

The competence-based accounts of the child null subject phenomenon, as outlined in sections 1 and 2, provide us with a range of rule-based explanations for the subject omissions. However, their coverage is limited and misses generalizations concerning the general fragmentary nature of child speech.

[17] Here, I use 'select' in a general sense. I do not mean to implicate that the decisions are necessarily conscious or considered.

The alternative performance-based approaches seem to offer intuitively more satisfying accounts. However, again, each faces problems. The processing accounts focus on answering the first of the questions identified in 2.6: why does the child's speech frequently involve omissions? Each account seems to be striving to identify one performance factor which answers this question. By doing so, each account brings to light an interesting range of data and reveals certain patterns and generalizations, but none is able to account for all of the available information on the phenomena. The pragmatic approach focuses mainly on question 22b: by what process does the child select which items to omit?

I intend to take this previous research and show how the findings may be integrated and extended using an established pragmatic framework. In section 4.2, I provide a brief overview of the pragmatic framework in which I have chosen to work: relevance theory, and in 4.3, I look more closely at how such a reanalysis may shed further light on the phenomena.

4.2 Relevance Theory

Relevance theory (Sperber & Wilson 1995) is a theory of utterance interpretation which is cognitively based. How relevant a stimulus is to a particular person at a particular time depends on how many cognitive effects (e.g. warranted conclusions) it produces and how much processing effort it demands. The more cognitive effects derived and the less processing effort expended, the more relevant the person will find it. According to RT, human cognition is geared towards maximising relevance. At any one time there may be stimuli in our environment which are highly relevant to us or not relevant at all, and the degree of relevance may vary with the context and the individual. For example, John and Mary are sitting in the park and a bumble bee flies past. The presence of the bee may be of pretty low relevance to John but may be of high relevance to Mary, who is allergic to bee stings. Whereas the bee stimulus is only likely to lead John to draw a few rather general conclusions at most, perhaps about the behaviour of bees or the time of year, it is likely to lead to many more for Mary.

When a speaker addresses an utterance to a hearer, they create a stimulus. However, unlike the bee flying past, the utterance is a deliberate act of communication. Sperber and Wilson argue that when a speaker deliberately addresses a hearer, the hearer is entitled to expect a certain level of relevance (e.g. a certain level of plausible and easily derivable conclusions). Specifically, they are entitled to presume that the utterance will be optimally relevant and to interpret it accordingly. This presumption of optimal relevance is itself part of what is communicated, and Sperber and Wilson define it as follows:

(25) An utterance or other ostensive stimulus is optimally relevant if and only if:

a. The ostensive stimulus is relevant enough for it to be worth the addressee's effort to process it.
b. The ostensive stimulus is the most relevant one compatible with the communicator's abilities and preferences.

This presumption allows the hearer to follow an automatic comprehension procedure when interpreting an ostensive stimulus such as an utterance:

(26) The Relevance Theoretic Comprehension Procedure:

Follow a path of least effort in deriving cognitive effects; stop when your expectation of relevance is satisfied.

This means that the first interpretation reached which makes the utterance relevant in the expected way will be the one automatically selected.

4.3 Applying the theory

When a child in the null subject phase produces an utterance, she, like any other human producing an ostensive stimulus, communicates, as part of her meaning, that her utterance is optimally relevant. The hearer is therefore entitled to assume that it is at least relevant enough to be worth processing, and that it has been formulated – to the extent that this is compatible with the speaker's abilities and preferences – so as to produce as many cognitive effects as possible, for the lowest possible cost in processing effort.

I believe that this definition of optimal relevance suggests answers to both parts of (22), and therefore gives us an insight into the phenomenon of the child null subject. In particular, it allows us to integrate the processing constraints which encourage the child to omit some surface element or other with the pragmatic constraints which help to determine which element she will omit.

(22) a. Why does the child's speech frequently involve omissions?

Relevance theory offers us at least two ways to incorporate processing considerations into our account. In the first place, processing constraints on production are covered by the reference to the speaker's 'abilities' in clause b of the definition of optimal relevance. In the second place, the role of processing effort in comprehension is covered by the claim that to be optimally relevant, an utterance must be at least relevant enough to be worth the hearer's processing

effort, and that it has been formulated so as to yield the greatest effects, for the smallest effort, compatible with the speaker's abilities and preferences. I will start by considering the role of processing constraints on production.

The child's linguistic abilities and performance skills are not yet fully developed and the child producing an utterance must try to communicate within these limitations. As we have seen, Paul Bloom and Lois Bloom provide evidence for some kind of cognitive or processing limitation in the child speaker. Sentential length or structural complexity may trigger an overload of the child's processing systems, which results in some surface constituent(s) having to give way and be omitted. Olson's (1973) work on memory span and cognitive development may also provide insight into the reasons behind the child's need to reduce surface form.

On this account, the child omits surface linguistic elements to simplify the utterance in order to bring it within the limits of her productive abilities. This approach sheds new light on other aspects of the child null subject phenomenon. The extent of subject drop varies across children and from situation to situation. Relevance theory suggests an explanation for this. Just like adults, children are affected in their ability to express themselves by the state of their emotions, their physical condition and by the circumstances in which they are speaking. They are also undergoing the process of acquiring a language, learning many other new things about the world and developing many other skills as they grow. Relevance theory does not entail any particular account of the child's productive processing abilities, or choose between the competing accounts outlined above, but it does suggest two points that may be worth bearing in mind in developing a fuller account.

First, the prediction is that the child subject-drop phenomenon is there to make things easier for the speaker rather than the hearer. From the point of view of an adult hearer, it makes the utterance less stylistically acceptable, and must be condoned on the ground that the child is unable to do better, rather than seen as a positive contribution to overall relevance. This makes the study of alternations in subject-drop vs. non-subject-drop forms of particular interest. Second, the different productive processing constraints discussed in performance accounts may lend themselves to comparative treatment. Some surface forms may require more productive processing effort than others, and we may be able to assess how much overall effort would be saved by the omission of individual constituents. A speaker who is forced to omit some surface linguistic element because of productive processing constraints should omit enough elements to bring the utterance within her productive abilities, while minimising the risk of misunderstanding. In considering which elements will minimise the risk of misunderstanding, the hearer's processing effort needs to be taken into account, and I will now turn to this.

(22) b. By what process does the child select which items to omit?

The presumption of optimal relevance again suggests an answer. A child aiming at optimal relevance but forced to omit some surface element should omit those elements whose omission is least likely to detract from overall relevance. Of course, this suggestion leads to many more questions. What is it that makes the omission of some surface elements detract less from overall relevance than others? Why are subjects and certain other categories consistently omitted, whilst other elements are retained? According to the relevance theoretic account, the general answer must be that a surface element can be omitted if its content is easily inferred (causing minimal additional processing effort) at minimal risk to overall understanding. Typically, such elements will be 'given' rather than 'new', 'topic' rather than 'focus', 'theme' rather than 'rheme'. Relevance theory suggests a way of approaching these notions in terms of a more general distinction between the contributions of individual constituents to 'foreground' and 'background' information, and I would eventually like to pursue this in approaching the phenomenon of child subject-drop.

Meanwhile, as noted above, the notions of processing effort and cognitive effect are crucial to Relevance theory, and working within such a framework should allow us to apply these notions to the existing data and make predictions which can then be tested. Here the notion of hearer's processing effort is particularly important. I want to consider whether the various findings from the existing accounts can be accommodated within the relevance theory framework and whether doing so will suggest solutions to some of the outstanding issues mentioned above.

As we have seen, the existing data seem to lend themselves to theories which deal with tendencies rather than absolutes. The rule based approaches face the problem that there are exceptions to each of the proposed rules. However, Relevance theory allows us to do away with such rules and instead consider the data from the perspective of effort versus effect. In addition to causing the speaker a certain amount of productive processing effort, an utterance will demand a certain amount of processing effort from the hearer. In return for this, it will yield a certain range of cognitive effects. Ideally, a speaker who is forced to omit some element of the utterance because of productive processing constraints should omit those elements which (a) bring the utterance within her productive abilities and (b) allow the hearer to infer her intended meaning with a minimal expenditure of extra processing effort and minimal risk to overall understanding. Thus a full account of the child subject-drop phenomenon will need to consider both speaker's and hearer's processing effort. Using this approach, it is now necessary to consider what factors contribute to both speaker's and hearer's processing effort, as well as to hearer's cognitive effects. It is at this point that I return to the findings from the existing accounts. These findings suggest that there are a number of factors

contributing to both effects and effort. We have seen how negation, unfamiliar vocabulary, sentential, VP and subject length, metrical complexity and rightward complexity in an utterance increase the speaker's processing effort and appear to make omissions more likely. However, a speaker aiming at optimal relevance is most unlikely to omit a negation marker, because its content would be extremely hard for the hearer to infer, and the risk of misunderstanding would be correspondingly great. From the hearer's perspective, the most easily dispensable surface elements would be those he is expecting to find anyway, which would therefore be particularly easy to infer. Thus, factors such as a lack of stress, the rate of previous mention, given versus new information and topic status[18] are associated with constituents whose contribution is easily inferable. The more of these factors that are present, the more vulnerable to omission the elements become.

4.4 Concluding remarks

Approaching the existing data from within an established framework of utterance interpretation allows us to suggest an explanation for why none of the previously provided accounts completely explains the data, and why there appear to be exceptions to each proposed rule. I am suggesting that omissions occur when a number of contributory factors converge on the same element. The factors involved may vary from utterance to utterance and there are no hard and fast rules about which constituents will or will not be omitted. Nothing is obligatorily omitted, and given the right context, nothing is immune to omission. To sum up, the child is producing utterances which are as relevant as her abilities allow by omitting the surface constituents whose omission is least detrimental to overall relevance, until the utterance is simplified enough to fall within her processing capabilities.

Working with this framework allows us to make certain predictions concerning what will be omitted and when, and allows us to bring together the disparate and at times seemingly conflicting findings from the existing research to offer a more comprehensive account.

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[18] Although Topic has been considered as part of a competence account, it is acknowledged that pragmatic factors are at play and for this reason I consider it as a possible contributory factor.

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