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The acquisition of Jamaican Creole: Null subject phenomenon

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ABSTRACT

This article provides the first systematic analysis of early subject omission in a creole language. Basing our analysis on a longitudinal corpus of natural production of Jamaican Creole (JC), we observe that early subject drop is robustly attested for several months. Early subject omission is basically confined to the clause initial position, being virtually absent from instances of *wh*-preposing, as has been observed for other languages. The acquisition of JC thus provides empirical support for the claim that early null subjects are a case of the "Privilege of the Root," and for the Truncation Hypothesis (Rizzi 1992, 1993/94, 2006). However, the occurrence of subject-drop following null interrogative operators in null *wh*-questions and yes/no questions suggests that the mechanism of truncation needs fine-tuning. To respond to this challenge, we suggest an approach to the privilege of the root and truncation that capitalizes on the spell-out mechanism, rather than on structure-building operations.

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1. Introduction

One of the main features of child language is the omission of functional elements that are normally obligatory in the target language. In this study, we examine the phenomenon of null subjects in the acquisition of JC, a non-null subject language. The acquisition of creole languages is an understudied topic, and aside from Adone's (1994) work on Mauritian Creole, and more recently Costa and Pratas's (2012) work on Capeverdean, there is no comprehensive discussion of the occurrence of null subjects in these contexts. However, both Mauritian and Capeverdean deviate from the classical creole pattern by themselves allowing null subjects in certain contexts. This is not the case in the vast majority of creole grammars. Atlantic creoles, such as Guadeloupean, Martinican, Belizean, Berbice Dutch, Guyanese, Saramaccan, Sranan, and Haitian Creole, to name a few, show a very strong tendency to have obligatory subject pronouns (Haspelmath et al. 2013). The general conclusion is then that "more cross-linguistic data is required to provide more insights into this domain, together with the study of creole acquisition" (Adone 1994:144).

The pattern observed in other languages is that children go through a stage in their language development where they omit subjects even if the target language does not have this option. This stage typically occurs for several months into the third year of life (Guasti 2002; Crisma 1992; Levow 1995; Haegeman 1995, 1996; Poeppel & Wexler 1991; Valian 1991; among others). Subject omission occurs both in the acquisition of null subject languages and non-null subject languages, even though at different rates and with different structural characteristics. Additionally the structural configurations in which early subject omission occurs are quite different from the configurations of subject omission in null subject languages (Rizzi 1992; Valian 1991, Clahsen et al. 1996; among others). Several proposals have been put forward to account for early subject drop, which we summarize in the following section.

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1.1. *Grammatical approaches*

Various hypotheses have been put forth to explain how children's grammar allows them to drop subjects in contexts in which subject omission is not permitted by their target grammar ever since Hyams's (1986) seminal work on the topic. Hyams proposed the Pro hypothesis, suggesting that the pro-drop parameter is initially set to the positive value and later resets in accordance with evidence from the target language. This account proved to be problematic, as it assumed that child null subjects are similar to adult null subject languages. The prediction is not borne out, as evidence reveals that the distribution of null subjects in child languages is very restricted in comparison with adult pro-drop languages (Valian 1990; Rizzi 1992). The same problem arises for the version of the parametric approach adopted by Yang (2002) to capture the early null subject phenomenon. Yang (2002) proposed a parametric learning theory whereby children maintain multiple grammars at one time. Hyams & Wexler (1993) used topic drop to account for the null subject phenomenon in child language. They proposed that missing subjects are due to the same processes allowing topicalized constituents to be dropped in a topic-drop language. Again, there are drawbacks to accepting a purely topic-drop account, such as the low rate of topicalized object drops compared to subject drop. Based on empirical observations due to Valian (1990), Rizzi (1992) conjectured that early subject drop is restricted to the clause-initial position, an instance of a more general property, making it possible to leave the specifier of the root node unpronounced, the "privilege of the root." He introduced the Truncation approach as a way to make structurally possible this particular instance of privilege of the root. If children have the option of truncating the CP layer in main declaratives, the subject position can become the specifier of the root node, a position which has the privilege of remaining unpronounced and accessible to discourse identification, thus escaping normal sentence-internal identification requirements for empty elements. Indeed the requirement that null elements have a clause-internal identifier only applies if it is virtually satisfiable. Given that the specifier of the root is not c-commanded by any category, it has no potential structural identifier and is thus exempted from clause-internal identification. Crucially, the truncation hypothesis proposes that while an immature system initially does not systematically project to the CP layer, if and when it does, all the intermediate projections must be present as well. It therefore follows from the truncation approach that early null subjects are virtually absent in interrogatives involving *wh*-preposing, since these obligatorily contain a CP, and therefore the subject position would no longer qualify as the specifier of the root.

1.2. *Performance approaches*

Approaches that are performance based claim that children's grammar is essentially like that of adults; however, children's productions are not always faithful to this internalized grammar, for instance with respect to null subjects, because of processing constraints. In support of this view of a discrepancy between performance and competence, P. Bloom (1990) argues that children know more about their target grammar (its rules and structures) than they themselves are able to produce. According to this perspective, omissions in production may be due to the child's capacities being overloaded by the length and structural complexity of utterances (L. Bloom 1970), which leads to an extra-grammatical simplification through the omission of the subject; contextual information may lead to recovering the meaning of the omitted constituent (Greenfield & Smith 1976). Important evidence against a purely performance-based approach has been provided by Orfitelli & Hyams (2008, 2012), who show that children in the subject-drop stage also accept subjectless sentences in English. This suggests that the null subject stage is not merely a production phenomenon but also a comprehension one, a state of affairs that supports a grammar-based approach predicting parallel production and comprehension results.

In this article, we will argue in favor of a system that analyzes early subject drop as a grammatical phenomenon, in line with the tradition initiated by Hyams (1986). According to this view, the strategies of omission applied by the child are universal grammar (UG)-consistent operations, or parametric values, also present in some adult languages. The causal factor leading the child to temporarily entertain such values may well be linked to performance limitations, as such nontarget consistent values typically place minimal burden on the child's production system (Rizzi 2006); nevertheless, the crucial point in this approach is that the child uses a fully legitimate grammatical option, made available by UG.

The JC data considered here provide clear evidence for an early null subject phase, with null subjects limited to occur in the specifier of the root, and virtually absent from *wh*-questions involving *wh*-preposing of a nonsubject element, thereby strongly supporting the core idea of the truncation approach. However, the interaction of subject drop with another dropping option involving clause-initial *wh*-elements presents an empirical challenge to the truncation hypothesis. The preponderance of null subjects in contexts of a *wh*-phrase for which the *wh*-element is not overtly realized calls for a revision of the classical truncation view. We will present a novel proposal and analysis in the latter part of the article precisely to account for this finding.

The article is organized as follows: In section 2 we present the longitudinal data on which our analysis is based. Section 3 briefly reviews the general pattern of the null subject phenomenon in the literature and compares this with the production of the children in our corpus. Section 4 discusses the object/subject asymmetry, showing that while subject drop is robustly attested, object drop is very rare. In section 5, we provide detailed evidence that early subject omission in JC is highly restricted: Early subject drop is only possible in clause-initial position and virtually excluded after an overt *wh*-element. Section 6 addresses the phenomenon of *wh*-drop and shows that subject drop is possible after a null *wh*-element. Section 7 explores a possible revision of the truncation approach to accommodate the empirical observation of section 6: In the approach sketched out, the mechanism is shifted from structure building to spell-out. Section 8 observes the compatibility of subject drop with yes/no questions. Section 9 summarizes and concludes the article.

2. The data

This study is based on longitudinal data. Six Jamaican Creole monolingual children, located at the most basilectal end of the continuum,[1] were recorded for a period of 18 months. Recordings 60 minutes in length were done every 10 days for the first five months and every 15 days thereafter. At the start of the research, the children were within an age range of 1;06 to 1;11. The age range and time frame of the research corresponds to the period in which syntax emerges in most children. Additionally, it is during this period that the phenomenon that interests us most, namely null subjects, has been documented in other languages. This work is limited to spontaneous, naturalistic digitally recorded conversations between/among child, parent(s), siblings, friends, and/or investigator(s). The children were recorded in the comfort of their homes. All recordings have been transcribed and morphologically coded along the CHILDES guidelines.

It should be noted that only utterances containing at least one predicate have been taken into account for the present analysis. Null subjects and null objects were coded and analyzed separately. Imperative clauses were excluded from the null subject analysis as they are target consistent, and only target-inconsistent subject drop was analyzed. Importantly, however, imperative clauses constitute an

[1]Given the existence of the creole continuum, various factors were considered in identifying and selecting the participants for inclusion in the study. Primary consideration was given to the area of residence and the level of education of the primary caregiver. More specifically, speakers from rural communities with less education were ranked closer to the basilectal end of the continuum (Meade 2001). In light of this observation, in our search for children to be included in our study, we targeted the "basilectal" community of Southfield, located in St. Elizabeth ("often cited as the most 'backward' of Jamaica's 14 parishes" [Patrick 1999:195]).

important percentage of the children's production demonstrating target-inconsistent object omissions and as such, along with declarative and interrogative utterances, they were taken into account in the discussion of null objects in section 4. Context of utterance was the main distinguishing criterion separating imperatives from nonimperatives: For example, imperatives are normally in the present tense, used for commands, and with optional subject. Moreover, native speakers' intuitions were also employed in distinguishing imperatives from other classes. Additionally, data produced within the first two months were not included, as this period included finalizing the selection of children for inclusion in the study. Three children were excluded, and subsequently replaced, on the basis of their ability to speak, availability for recordings, willingness to participate, and language used by their caregivers. Also, this period was used for familiarization of the researchers with the informants.

3. Early subject drop in JC

Jamaican Creole requires the overt expression of subjects in finite clauses. In early linguistic productions, however, children tend to omit this requirement, thereby producing utterances with root null subjects, as exemplified in (1)–(6). All the following sentences would be ungrammatical in adult Jamaican:

(1) ___ *iit aiskriim* (COL 1;11)
(1sg) eat ice-cream
'(I) ate ice-cream.'

(2) ___ *jraiv i tu* (RJU 2;01)
(2sg) drive 3sg too
'(You) drove it also.'

(3) ___ *fit mi fingga* (SHU 2;03)
(3sg) fit 1sg finger
'(It) fits my finger.'

(4) ___ *jraiv van* (KEM 2;04)
(1pl) drive van
'(We) drove the van.'

(5) ___ *taak tu dem aredi* (ALA 2;09)
(2pl) talk to them already
'(You) spoke to them already.'

(6) ___ *iit fuud don* (TYA 2;08)
(3pl) eat food COMP[2]
'(They) finished eating the food.'

In keeping with the literature, null subject sentences are attested very early on but usually tend to gradually disappear around the end of the third year of life (Rasetti 2003; Guasti 2002; Crisma 1992; Levow 1995; Poeppel & Wexler 1991; Valian 1991; among others). For instance, Hamann, Rizzi & Frauenfelder (1996) examined early omission of subjects in French and found that null subjects fall under 20% of the relevant utterances only around 2;10. Haegeman (1996) has found similar results for Dutch: At 2;04 Thomas's and Hein's use of null subjects in finite sentences was 39% and 43% respectively, which gradually declined to 13% (Thomas 2;11) and 16% (Hein 3;01) at the end of the period of observation. This gradual decrease of subject drop would therefore be expected also in children acquiring JC.

So what are the facts in Jamaican Creole? Figures 1 to 6 detail the individual production of target-inconsistent null subjects in our corpus. On the *x*-axis we present the percentage of production of null subjects and on the *y*-axis the informants' age in months;days format. The results include both

[2]COMP is used to refer to the completive aspect marker.

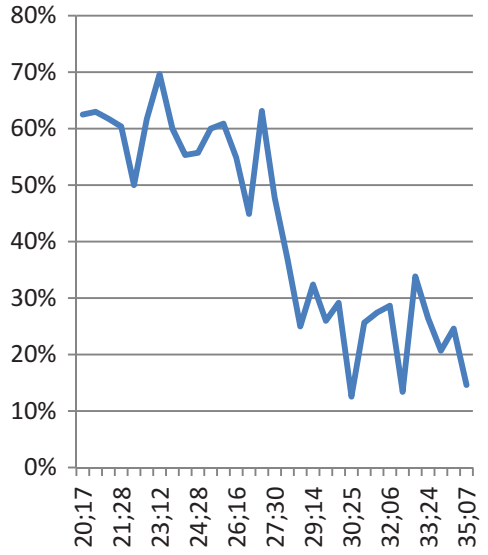


Figure 1. COL's null subjects.

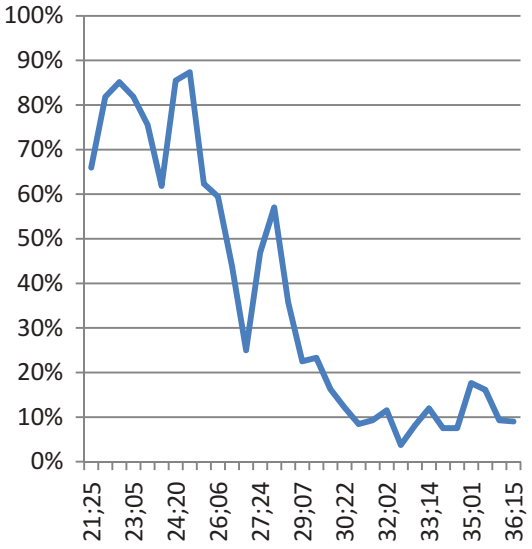


Figure 2. ALA's null subjects.

declaratives and interrogatives for which the subject is omitted. As previously specified, being that in JC, null subject sentences are grammatical as imperatives, imperatives are excluded from this analysis. Children acquiring JC are observed to correctly produce null-subject imperatives from the earliest ages.[3]

[3]The data also reveal the presence of vocative imperatives where the subject is overtly pronounced in the production of the children acquiring JC. We did not, however, conduct a quantitative study on the different types of imperatives detected in the corpus.

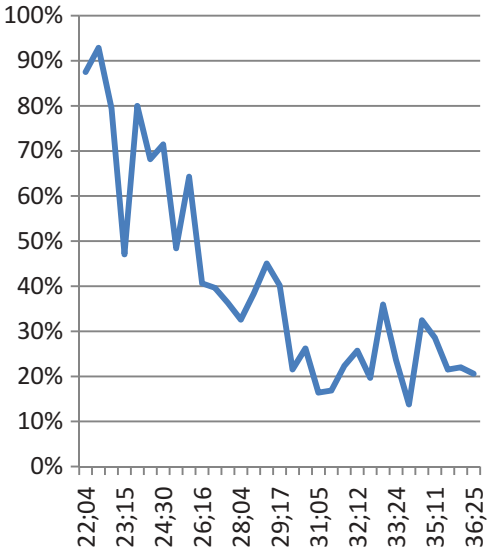


Figure 3. RJU's null subjects.

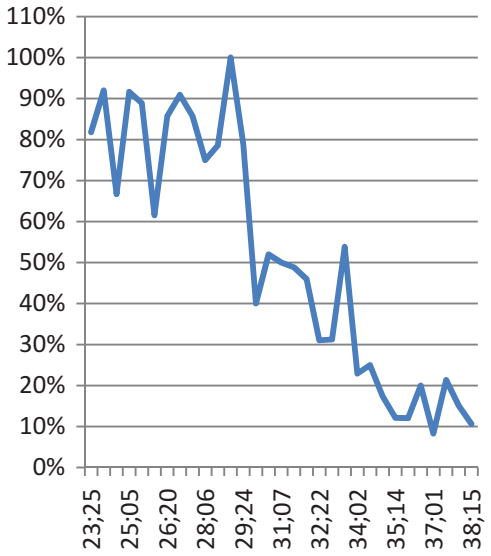


Figure 4. TYA's null subjects.

As demonstrated, there is a steady decline in the use of null subjects by all participants, not surprisingly with some individual variation. All participants, with the exception of SHU, displayed initial production of null subjects over a high of 60%, which gradually falls, in some cases to a low of under 10%. SHU, the eldest informant studied, as expected, had the lowest production of null subjects throughout the corpus.

The examination of the total production of null subjects reveals a striking correspondence with results presented in Hamann, Rizzi & Frauenfelder's (1996) study. As demonstrated in Figure 7, at 2;08 the production of null subjects drops to 20%, and it fluctuates around 10% at age 3. The data therefore support the cross-linguistic finding that the proportion of null subjects

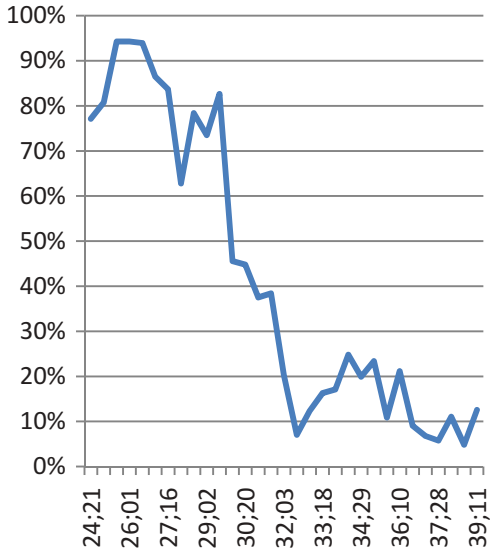


Figure 5. KEM's null subjects.

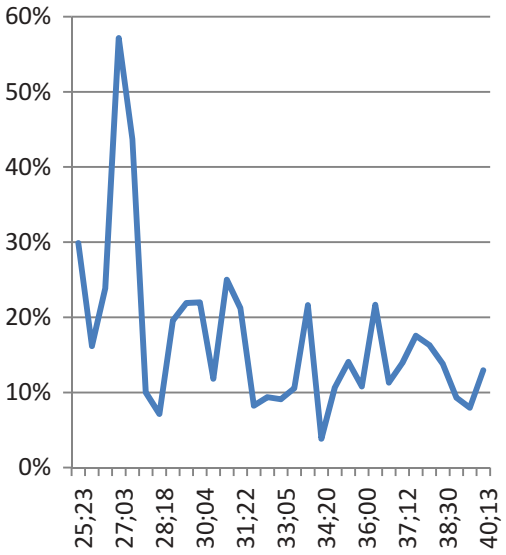


Figure 6. SHU's null subjects.

diminishes as a function of age. It is our assumption that during the period where null subjects remain more or less stable (around 10%) the child system starts converging to the target grammar.

For our analysis we focus on the period where subject omission is a robust phenomenon, i.e., before age 3, and provide detailed breakdown of the number of omissions of obligatory subjects with respect to the total production of verbal utterances for each participant. The individual details are presented in Appendix A. Like in Figures 1 to 6, we examine declaratives and interrogatives, omitting imperative utterances.

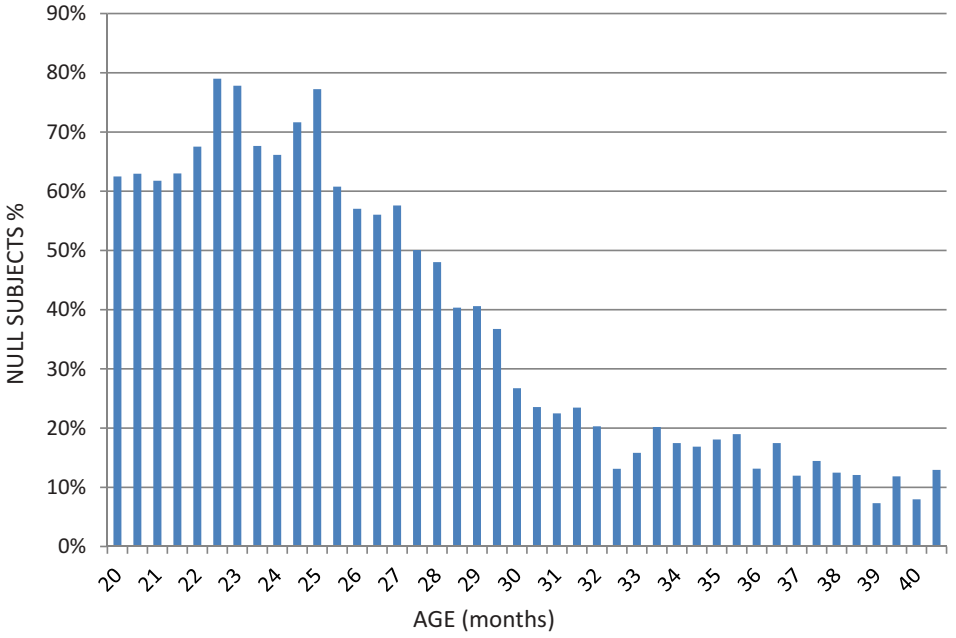


Figure 7. Percentage null subjects.

While the data reveal that subject omission is robustly attested in children's early production, the phenomenon of object drop is much less attested. We will examine the nature of subject versus object omission in the following section and then return to the discussion of the null subject phenomenon.

4. Subject vs. object omission

Could subject drop be just a particular case of a generalized argument drop strategy?[4] In order to address this question, one possible approach is to compare subject and object drop. For instance, in child English subject and object drop are both attested but differ in systematic ways. On the one hand, subject omission is structurally "selective" in contrast to object omission: Subject omission is restricted to only specific environments (the specifier of the root), whereas object omission appears to occur more liberally in varying grammatical contexts. Moreover, subjects are dropped with much greater frequency than objects, as evidenced by Bloom (1990), Hyams & Wexler (1993), Hyams (1986), Valian (1991), Wang, et al. (1992), among others.

The same systematic differences also emerge from our corpus of child JC.

Given that the possibility of omitting an object in JC is highly context dependent, the context in which the null elements occurred was used as the main criterion for establishing target inconsistency. To calculate the null elements, we counted all verbal utterances for which the pronominal object and or subject[5] is obligatory based on adults' judgments in the specific

[4]Another argument drop strategy observed in languages is that of topics. In JC, topicalization of objects requires the presence of a resumptive pronoun in the comment to refer back to the displaced topic (see work by Christie 1997; Durrleman 2008). If the topic were to be dropped, there would still be the pronoun, and as such the structure would be ambiguous between a topic drop structure and a structure with a clause-internal pronoun: So whether JC allows topic drop cannot be tested straightforwardly.

[5]JC does not have subject or object clitics, and all subject and object pronominals have DP distribution, much as in English.

Table 1. Total Target Inconsistent Subject and Object Omissions

Informants	*Total verbal utterance*	*Nontarget null subj*	*% Null subj*	*Nontarget null obj*	*% Null obj*
COL	3,373	1,020	30.24	91	2.69
ALA	4,992	1,151	23.06	127	2.54
RJU	3,242	953	29.39	98	3.02
TYA	985	369	37.46	91	9.2
KEM	3,814	1,329	34.84	122	3.19
SHU	2,326	364	15.6	40	1.72
TOTAL	18,732	5,187	27.69	569	3.04

discourse context. This can be illustrated by the example presented in (8): The utterance *momi bied* could be totally grammatical if the intended meaning was "mommy showered/had a bath"; however, based on the context of the discourse, the presented meaning with the object being omitted was the only possible reading (i.e., "Mommy bathed **me**"). Likewise, for example (12), *put aan* could be analyzed as an imperative whereby the subject omission would be grammatical; however, the context provided evidence that the subject was obligatory in this utterance and only a target-inconsistent subject drop (and object drop) analysis could be feasible. Note that this is the only section where imperatives are considered for our analysis. They are included as an important percentage of the children's production, demonstrating that target-inconsistent object omissions are found in these clauses.[6] The findings reveal that total target-inconsistent null objects accounted for only 3.04% of the entire data, while null subjects accounted for 27.69% during the period where subject omission is still robust in the corpus (i.e., up to 2;11). As displayed in Table 1, the subject/object asymmetry is clearly evident in all informants, despite their individual variation.

Examples of null objects in the corpus are presented in (7)–(12). These are target inconsistent, as depending on their context of utterance, the omitted objects are obligatory in the adult's language.

(7) ___ *fiks* ___ (ALA 1;11)
Ø fix Ø
'I am fixing it.'

(8) *Momi bied* ___ (COL 1;11)
Mommy bathe Ø
'Mommy bathed me.'

(9) *Momi biit* ___ (SHU 2;02)
Mommy beat Ø
'Mommy beat him'.

(10) ___ *waa tek out* ___ (RJU 2;07)
Ø want take out Ø
'I want to take it out.'

(11) *A mii-mii av* ___ (KEM 2;10)
Foc 1sg-1sg have Ø
'I am the one who have it (a blue pencil).'

(12) ___ *put aan* ___ (TYA 2;08)
Ø put on Ø
'I am going to put it on.'

[6]The data reveal 8% null objects in imperative clauses compared to 3% and 1.5% in declarative and interrogative clauses respectively. The prevalence of null objects in imperative clauses seems to be interesting; however, we have not examined this phenomenon in depth, and we will not try to analyze it in this article.

These data from JC patterns with results from English (3.7% object omission) as presented by Wang et al. (1992). To account for this discrepancy, Wang et al. proposed the hypothesis that there is more than a single parameter controlling the use of null arguments. The current null subject/object asymmetry found in our data therefore provides further evidence in favor of the hypothesis that the phenomenon of subject drop is quite distinct from that of object drop, which is a relatively marginal phenomenon and as such requires a separate analysis.[7] We will now return to the discussion of the null subject phenomenon.

5. Subject omission as a manifestation of the privilege of the root: Overt *wh*-questions

Recall that Hyams (1986) put forth the hypothesis that early subject drop results from a mis-setting of the Null Subject Parameter. Rizzi (1992), however, argued that the early subject omission of a non-null subject language (non-NSL) does not correspond to the omission of subjects of true null subject languages, based on Valian's (1990) observation that subject omission is quite robust in early English declaratives, but it is virtually absent in post *wh*-environments. This finding gave rise to the following conjecture:

(13) Early subject drop in the acquisition of a non-null subject language is only possible in the Specifier of the root.

If the sentence starts with a *wh*-element in the C system, the subject is not the specifier of the root and cannot be dropped. This is true also for other languages: French (Crisma 1992; Levow 1995), Dutch (Haegeman 1995, 1996), and German (Clahsen, Kursawe & Penke 1996). These findings provided evidence that early subject drop in non-NSL is a separate phenomenon from the positive fixation of the null subject parameter, as their structural environments are different. Null subject languages allow null subjects in initial and noninitial (post-*wh* and embedded) environments, as shown in example (14) from Italian, while early subject drops in non-NSL are restricted:

(14) *Dove* ___ *va*
Where ___ goes?

JC, being a non-NSL, is expected to be in keeping with conjecture (13). Indeed, during the period of high target-inconsistent null subject production (up to 35 months), the omission of subjects is highly restricted.

Subjects are only dropped in initial positions and hardly ever in contexts following a *wh*-element. So, in post-*wh* environments we typically find overt subjects, as in the following cases:

(15) *Wa im a ron fa?* (ALA 2;06)
Why 3sg PROG run for
'Why is he running?'

(16) *We Matyu gaan?* (ALA 2;07)
Where Matthew gone
'Where has Matthew gone?'

(17) *We momi kom fram?* (COL 2;02)
Where mommy come from
'Where mommy came from?'

[7]It is worth noting that, excluding imperatives from our analysis of object omission, as done for subject omission, object drop occurs at 2.25%, which still clearly illustrates that the phenomenon of object drop is separate and apart from subject drop.

(18) *Wa granmaa a du?* (COL 2;05)
What grandma PROG do
'What is grandma doing?'

(19) *We yaa luk ova de so?* (KEM 2;09)
Why 2sg~PROG look over there so
'Why are you looking over there?

(20) *We i kyat a du, mm?* (KEM 2;08)
What Det cat PROG do Com
'What is the cat doing?'

(21) *Uu shi a taak ?* (RJU 2;07)
Who 3sg PROG taak
'Who is she talking to?

(22) *We dem a go?* (RJU 2;07)
Where 3pl PROG go
'Where are they going?'

(23) *Ou yo lak i?* (SHU 2;09)
How 2sg lock 3sg
'How do you lock it?'

(24) *We yo tikl mi fa?* (SHU 2;05)
Why 2sg tickle 1sg for
'Why did you tickle me?

(25) *We Moiisha a kaal mi fa?* (TYA 2;09)
What Moesha PROG call 1sg for
'What is Moesha calling me for?'

(26) *We yaa go?* (TYA 2;06)
where 2sg~PROG go
'Where are you going?'

Let us now examine the acquisition of interrogatives in JC and its interaction with early null subjects. We will center our analysis around the period where the production of null subjects is still robust in the corpus, i.e., up to 2;11, and present evidence in support of the argument that early null subjects in JC are a manifestation of the privilege of the root.

5.1. *Overt* Wh-*phrase and null subjects*

The data, as presented in Appendix B, show the production of overt *wh*-elements by children up to the age of 2;11. In order to provide an accurate representation of the subject omissions in the data, 162 utterances where the *wh*-element itself is the subject are not presented. During this period where null subjects are still robustly attested in the corpus, of 900 overt nonsubject *wh*-questions, only 10 cases were noted where the subject was dropped in post-*wh* position. This represents 1.11% of overt *wh*-constituent questions for which the *wh*-element is not the subject. This finding is in keeping with the literature, as it has been reported that such sentences normally occur between just under 1% and 5% for other languages: French—0.9% null subjects in *wh*-questions compared to 40.5% in declaratives (Crisma 1992), Dutch—2% null subjects in *wh*-questions compared to 23.5% in declaratives (Haegeman 1995), English—1.6% null subjects in *wh*-questions (Valian 1991), German—4% null subjects in *wh*-questions (Clahsen, Kursawe &

Penke 1996), Swedish—5.2% null subjects in *wh*-questions (Platzack and Josefsson 2000). The minimal attestation of subject drop following a *wh*-element shows that in JC, like the aforementioned non-NSLs, subject drop is restricted to the initial position.

The 10 exceptional cases of subject drop following a *wh*-clause[8] are presented in examples (27) to (36):

(27) W*ai* ___ *jrap i?* (ALA 2;04)
Why Ø drop it
'Why did you drop it?'

(28) *Wier* ___ *goin Kiisha?* (ALA 2;03)
Where Ø going Kiisha
'Where are you going Keisha?'

(29) W*e* ___ *jraiv i fa?* (ALA 2;04)
Why Ø drive it for
'Why did you drive it?

(30) O*w* ___ *nuo?* (ALA 2;04)
How Ø know
'How do you know?'

(31) *We* ___ *goin?* (ALA 2;04)
Where Ø going
'Where are you going?'

(32) *Wa* ___ *du?* (COL 2;05)
What Ø do?
'What is he doing?'

(33) *We* ___ *gaan in?* (RJU 2;02)
Where Ø gone in
'Where did he go in?'

(34) *We* ___ *aa go?* (RJU 2;07)
Where Ø PROG go
'Where are they going?'

(35) *Uu* ___ *bi?* (SHU 2;02)
Who Ø be
'Who is he?'

(36) *We* ___ *du?* (SHU 2;06)
What Ø do
'What did you do?

[8]There is one utterance in the corpus with an in situ *wh*-element and a null subject. In order not to detract from the discussion of null subjects following a *wh*-element, we present it here:
(i) ___ *ina i ous fi wa?* (KEM 2;09)
Ø into DET house for what
'Why is she in the house?'
Do note that the option for the *wh*-element to remain in situ is rarely attested in JC most robustly as an echo-question (see Durrleman 2008), as in, e.g., *ii*, and as such children rarely explore this option. Only five of these utterances were noted in the corpus.
(ii) INV: yo afi go aks granmaa fi mek som fi yo leeta.
'You have to ask grandma to make some for you later.'
CHI: ***aks uu?*** (ALA 2;04)
Ask who
'ask who?'

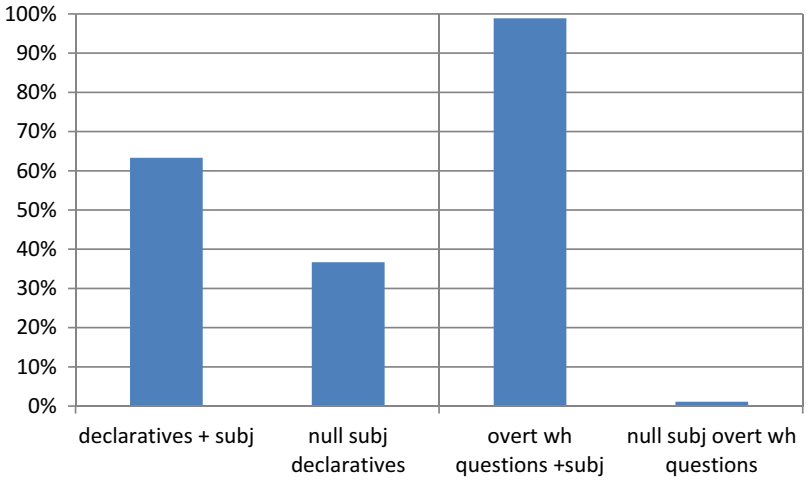
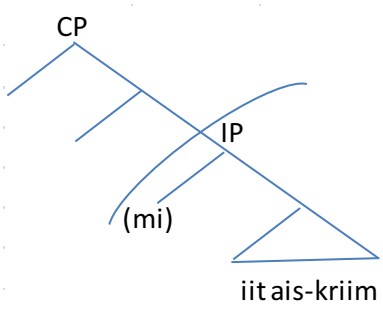


Figure 8. Comparison between declaratives and overt *wh* questions.

We now present a comparative analysis of the production of null subjects in declaratives during the same period.

The data (see Appendix C) show a sharp difference in the production of null subjects in declarative clauses when compared to that attested in overt *wh*-phrases. During the period under examination, subjects are omitted in 36.7% of declarative utterances compared to 1.1% omission in overt *wh*-phrases, where the *wh*-element is not the subject. The distribution of null subjects appears to be sensitive to the initial position in the clause. The presence of the *wh*-element presents restrictions on subject drop, even during the phase where the omission of subjects is very high. The comparison between declarative and *wh*-environments is summarized in Figure 8.



This striking discrepancy is in line with our expectations and can be accounted for by the Truncation approach. Children's early clauses may be truncated at structural layers lower than CP. When CP is not projected, subjects occupy the highest position of the structure and may remain null. A declarative utterance may therefore be truncated at the IP level, as shown in (37), thereby permitting null subjects, a particular case of the privilege of the root.

(37)

(37a) Mi iit ais-kriim
1sg eat ice-cream
'I eat ice-cream'

In *wh*-questions involving *wh*-fronting, however, the CP must be generated to host the *wh*-element. Truncation is therefore not possible; the subject is consequently no longer the Spec of the root and cannot be dropped. It is during the third year of life that the option to truncate becomes very restrictive and null subjects disappear.

If the pattern with overt *wh*-elements straightforwardly supports the classical truncation approach just illustrated, the option of a constituent question with a null *wh*-element introduces an important variation on the theme, which requires a revision of the approach. We will now look at this phenomenon.

6. Null *wh*-elements

The literature reports that children frequently drop *wh*-words when acquiring V2 languages such as Swedish, Dutch, and German, (Santelmann 1995, 1997; Kampen 1997; Felix 1980; among others) as exemplified in (38):

(38) ___ sa du? (Embla 2;03 from Santelmann 1997)
Ø said you
'(What) did you say?'

V2 languages make *wh*-drop very easily recognizable, precisely because of the V2 constraint. A question with null *wh* is an interrogative sentence with the inflected verb in first position and a clause-internal gap. The interpretation as a *wh*-question is rendered plausible by the context. The phenomenon is clearly not restricted to the acquisition of V2 languages: See Yamakoshi (2002) on English, French, and Spanish. In all these cases, *wh*-drop is not target consistent, but there are cases of adult languages manifesting *wh*-drop in different structural environments: American Sign Language (Petronio & Lillo-Martin 1997), Wolof (Torrence 2012), Norwegian (Svenonius and Kennedy 2006), and Bavarian (Bayer 2010). Child *wh*-drop is observed during the period where *wh*-questions with overt *wh*-words are also produced, so that overt and null *wh*-elements alternate in natural production. Yamakoshi's (2002) elicitation experiment showed a sizable number of *wh*-drops in productions by learners of English but not in productions by learners of Japanese, suggesting that *wh*-drop can only affect XPs in SpecCP and never *wh*-elements in situ (as in Japanese). These observations strongly suggest that at least the core cases of *wh*-drop are another instance of the privilege of the root.

We have observed that this phenomenon of null-*wh* is also attested in our data. Despite the requirement of adult JC to overtly express the *wh*-element in constituent questions, children omitted the *wh*-element in 21.2% (286/1,348) of their utterances. This is comparable to the quantitative dimension of the phenomenon in other child languages (for example, Clahsen et al. 1996 observed 19% of *wh*-drop). Examples (39)–(42) show examples of null *wh* attested in our corpus:

(39) ___ *i gorl niem?* (COL 2;05)
Ø Def girl name
'(What) [is] the girl's name?'

(40) ___ *Jada lip-glaas de?* (SHU 2;07)
Ø Jada lip-gloss Loc
'(Where) [is] Jada's lip-gloss?'

(41) ___ *i likl gorl a go?* (ALA 2;07)
Ø Det little girl PROG go
'(Where) [is] the little girl going?'

(42) ___ *shi a du?* (RJU 2;06)
Ø 3sg PROG do
"(What) [is] she doing?"

Closer examination of the data reveals a strikingly high number of null subjects in these *wh*-questions with null *wh*-elements compared to *wh*-questions where the *wh*-element is overtly realized. We provide a detailed examination of this phenomenon in the next section.

6.1. *Null* Wh-*elements and null subjects in JC*

As revealed by the data (presented in Appendix D), when the *wh*-element is not overtly pronounced in constituent questions, the subject has the option to be realized or to remain null. Nonrealization of the subject is attested in 60 out of 265 cases (22.6%) of the null *wh*-questions where the omitted *wh*-element is not the subject. Our data reveal a striking correspondence to that reported by Clahsen, Kursawe & Penke (1996) for German, where 18% missing subjects were found in null *wh*-questions.

Again, we do not include the 21 utterances where the omitted *wh*-element is the subject. *What, where*, and *why* questions (25, 17, and 16 respectively) are most frequently omitted in questions that also omit the subject. These are also the most attested question types in the corpus in addition to the *who* questions.

In order to verify that these utterances are authentic *wh*-questions, which drop both *wh*-element and subject, the context of utterance and the intonation is essential. Provided in (43)–(46) are some examples and their context of utterance.

(43) INV: *felisha beks wid yo RJU?*
'Is Felisha vexed with you RJU?'
CHI: *mmh?*
'mmh?'
INV: *felisha beks wid yo, ar a AJ shi beks wid? kaa mi nuo a no mii shi beks wid.*
'Is Felisha vexed with you or is it AJ that she is vexed with? Because I know it is not me she is vexed with.'
CHI: ___ ___ *aa beks wid?* (RJU 1;11)
Ø Ø PROG vex with
'Who is she being vexed with?'

(44) CHI: *uu dat?*
'Who is that?'
INV: *waa man.*
'a man.'
CHI: *man?*
'man?'
INV: *mmhmm*
'yes.'
CHI: ___ ___ *kum fram?* (ALA 2;02)
Ø Ø come from
'Where does he come from?
INV: *mi no nuo.*
'I don't know.'
CHI: *aks im!*
'Ask him!'

(45) CHI: *we i kii de?*
'Where is the key?'
INV: *si yo av i.*
'See, you have it.'
CHI: *oo.*
'oh.'
INV: *mmhmm.*
'Mmhm.'
CHI: *fi yo kii de?*
'(Where) is your key?'
INV: *a fi mi kii dat.*
'That key is mine.'

CHI: ___ ___ *get i fram?* (KEM, 2;07)
Ø Ø get it from
'(Where did you) get it?'
INV: *mm?*
'mm?'
CHI: *get i fram? Mm?*
'(Where did you) get it, mm? '
INV: *we mi get i fram?*
'Where did I get it?'
CHI: *yes.*
'yes.'
INV: *mi get i fram out a di kyar.*
'I got it from out the car.'

(46) CHI: *we yo a du an tamir fuon?*
'What are you doing on Tamir's phone?'
NIC: *aa mi no nuo.*
'aah I don't know.'
CHI: *aks tamir!*
'ask Tamir.'
NIC: *yuu aks tamir we mi a du pan i fuon.*
'You ask Tamir what am I doing on the phone.'
CHI: ___ ___ *aa du pan i fuon?* (ALA 2;08)
Ø Ø PROG do on DET phone
'(What is she) doing on the phone?'

In addition to the context of utterance and the intonation, evidence for null *wh*-utterances comes from the stranding of the preposition *fa*. As seen in (47), In JC, *why* may be expressed as *wa… fa* 'what … for.' Our data reveal that there are 32 of these "what … for" questions for which the *wh*-element is omitted and leaving *fa* stranded, 15 of which also omit the subject. In these examples, the stranding of the preposition is clear evidence for a null *wh*.

(47) CHI: *grampaa kova op im mout.*
'Grandpa covered up his mouth.'
INV: *grampaa kova op im mout agen.*
'Grandpa covered up his mouth again.'
CHI: ___ ___ *kova op im mout agen fa?* (COL 2;08)
Ø Ø cover up 3sg mouth again for
'(Why did he) cover his mouth again?'

Also we note that there is the presence of a question semantic unit (QSU)[9] in some of the *wh*-constructions, for example *paa* in (48):

(48) ___ *paa di chok?* (ALA 1;10) Ø QSU DET truck
'(Where) is the truck?'

This QSU *paa* must occur with a *wh*-word, as in *we paa* or *wich paa* (literally 'where part' or 'which part'). The lone occurrence of the QSU provides direct evidence for a null *wh*-element.

Where *wh*-elements are dropped, declaratives can be distinguished from interrogatives, or *wh*-interrogatives from yes/no questions, by means of context, intonation, and the occurrence of the QSU. Examples (49)–(51) demonstrate discourse contexts where the same phrase *im gaan*, by the same informant, is interpreted as a *wh*-question, declarative, and yes/no question respectively.

(49) CHI: ___ *im gaan?* (RJU 2;06)

[9]As proposed by Muysken & Smith (1990), this QSU gives additional information regarding what is questioned. It is a part of the adult grammar. No material can intervene between the *wh*-word and the QSU. Also, with the exception of the QSU *mek* 'make' in *wa mek* 'why' (literally 'what make,' which can occur without a *wh*-word) the QSU cannot occur on its own as a *wh*-question marker.

Ø 3sg gone
'Where did he go?'
INV: *mi no nuo we im gaan.*
'I don't know where he went.'

(50) MOT: *kaal joshwa, kaal joshwa no.*
'Call Joshua, call Joshua (won't you ?)'
CHI: *im gaan.* (RJU 2;07)
3sg gone
'He is gone.'

(51) MOT: *si wan botaflai, sii im ova dier so, yo sii im? sii im de.*
'There's a butterfly, see he is over there, do you see him? There he is.'
CHI: *mm, im gaan?* (RJU 2;03)
COM[10] 3sg gone
'Mm, is he gone?'
MOT: *yes im gaan, an im priti.*
'Yes he is gone, and he was pretty.'

Questions with null *wh*-elements such as (39)–(48) are complete-force phases that plausibly involve movement of the *wh*-element to a designated landing site in the left periphery, much as ordinary constituent questions, except that the *wh*-element is not pronounced. Straightforward evidence for a movement analysis is offered by the V1 shape (where the verb is seemingly in sentence-initial position as opposed to the expected second position) of such null *wh*-questions in V2 languages. In order to satisfy the V2 constraint, the null *wh*-element must move from its base-generated position to occupy the sentence-initial position. Yamakoshi (1999) reviewed the phenomenon of *wh*-drop in seven languages and concluded that *wh*-drop occurs only in languages where *wh*-movement occurs overtly and is absent in in situ languages, such as Japanese.

Another evidence for a movement analysis of null *wh*-elements comes from the observation that in situ *wh*-elements were very sparse in the data. JC is a language with *wh*-movement and *wh*-in-situ questions are rarely attested, except as echo-questions (Durrleman-Tame 2008). As a result, *wh*-in-situ questions were also minimally attested in the children's production: Only 10 utterances were found where target-consistent in situ is permitted in "discourse-bound" restricted contexts, as exemplified in (52).

(52) *CHI: we i bi?*
'What is it?'
INV: rekaada.
'recorder'
CHI: rekaada?
'recorder?'
INV: ye.
'yes'
CHI: ***fi rekaad uu?*** (SHU 2;05)
INF record who
'To record who?'

The fact that both well-formed *wh*-questions and questions with *wh*-drop were extensively produced during the same period indicates that *wh*-drop does not occur in the base-generated position but rather in sentence-initial position. We propose that *wh*-drop in child language is a manifestation of the privilege of the root: A *wh*-element is moved to clause-initial position and can be left unpronounced there. In adult JC, however, like in English (Yamakoshi 2002) and many other languages, this option is lost, much as the early subject drop.

Moreover, direct evidence for a movement analysis in adult JC comes from the observation of a change in prepositional form (*fi/fa*) in *wh*-phrases, depending on whether the preposition is followed

[10]Communicator (COM) is used to refer to utterances that bear no syntactic content.

by a *wh*-trace or an overt object (Durrleman-Tame 2008). Durrleman-Tame (2008) shows that *fa* licenses a *wh*-trace, while *fi* does not. She states that "*Fa* appears to be the agreeing form of *fi*. Agreement would be triggered by transit of the wh-element from the PP specifier" (Durrleman-Tame 2008:87). As shown in examples (53) and (54), *fa* is used in utterances that are followed by a trace, indicating movement of the *wh*-element (53), while *fi* is used in utterances where the *wh* element remains in situ, for example, in echo questions (54).

(53) *Wa yu put i aan fa/*fi?*
'Why do you put it on?'

(54) *`Yo put i aan fi/*fa wa?*
'You put it on for what?'

As mentioned earlier, the stranding of *fa* in null constituent questions, as in (55), indicates that there is a *wh*-trace, which provides evidence for movement of the *wh*-element. Note that if the null *wh*-element were to remain in situ, we would have expected *fi* as in (54), none of which is in our corpus.

(55) ___ ___ *put i aan fa?* (ALA, 2;03)
Ø Ø put it on for
'(Why do you) put it on?'

We therefore assume a movement analysis for the JC cases, which straightforwardly accounts for the formal and interpretive properties of these structures as constituent questions, and for the option of a null *wh*-element as a particular case of the privilege of the root. But then, if (56) has a representation like (57)

(56) ___ ___ *get i fram?* (KEM, 2;07)
Ø Ø get it from

(57) $\text{where}_{\text{null}}$ C you_{null} get it from ___

clearly the CP structure is needed to permit movement of the null *where*; hence the structure cannot be truncated at the IP level, and the subject cannot be the Spec of the root. Still, a null subject is possible in this environment. The approach to the privilege of the root based on truncation qua radical absence of structure must therefore be revised to accommodate this case.

7. Revising the privilege of the root mechanism

The pattern that emerges from the previous section is therefore the following:

(58) a. Overt wh overt subject: ok
b. Null wh overt subject: ok
c. Overt wh null subject: *
d. Null wh null subject: ok

While cases (58)a, b, and c are predicted, case (58)d is unexpected under the traditional view of truncation expressed on structure building. Consider the following formulation of this view, an update of Rizzi (1992):

(59) In root clauses, structure building (merge) can stop at SubjP.

By SubjP we mean the projection that hosts the clausal subject in its Spec, along the lines of Rizzi & Shlonsky (2007) and much related work (it basically corresponds to IP in previous formulations).

This statement, in tandem with the assumption that the Spec of the root can be left unpronounced, captures run-of-the-mill cases of early null subjects in root declaratives but cannot deal with (58)d.

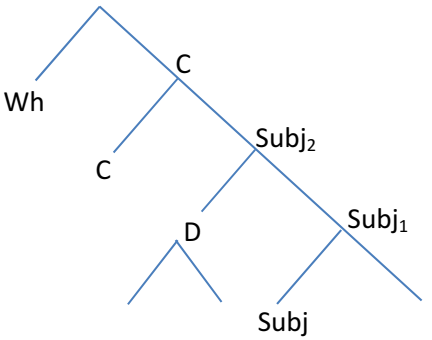
The problem with this case stems from the fact that, if the null *wh*-phenomenon involves *wh*-movement to the left periphery, as the evidence presented in section 6 suggests, the CP layer must be projected to function as the landing site of movement. But then the subject position would not be the

specifier of the root in such structures; hence the option of a null subject would not be expected. Put another way: If both the null *wh* and the null subject are instances of the privilege of the root, the two positions cannot simultaneously be the specifier of the root; hence the privilege of the root must be stated in a way extending the option of remaining unpronounced to more than one position. The problem also arises in the approach to finite null subjects in Wexler (2014), which shares with the truncation approach the assumption that early null subjects are in the specifier of the root.

The possibility we would like to explore is to shift the idea of truncation from structure building to the spell-out mechanism, as Fitzpatrick (2006) proposes in his treatment of (adult) aux-drop in colloquial English. Suppose that main clauses always are structurally complete structures (CPs), but their special property resides in an option of partial spell-out that is never available in embedded domains:

(59') In root clauses, spell-out can stop at SubjP.

In this view, the privilege of the root would not consist in the possible radical absence of external layers in root clauses, but in the fact that the spell-out mechanism could leave external layers unpronounced in otherwise complete structures. Example (58)a would amount to not taking option (59'), hence pronouncing the whole structure. Consider now (58)b and d. If we adopt Bare Phrase Structure representations (Chomsky 1995, ch. 4), the relevant subtree is the following, with label "Subj" characterizing the phrasal material projected from the head Subj



(digits 1 and 2 are not part of the label, and are simply meant to distinguish different occurrences of phrasal Subj)

(60)

Here « SubjP » of (59') may be taken as $Subj_2$. In this case, the whole $Subj_2$ phrase is sent to spell-out; hence the subject DP is pronounced, while the upper part of the structure (with the *wh*-element in the C-system) is not: This is case (58)b.

On the other hand if "SubjP" in (59') is taken as $Subj_1$ in (60), neither the subject DP nor the *wh*-element in the left periphery are sent to spell-out; hence they remain unpronounced: This corresponds to case (58)d. So, the computation of (58)d would be allowed by projecting the structure up to the whole CP, which would permit *wh*-movement, and by spelling out only up to $Subj_1$, which would leave the subject DP and the whole CP structure (including the *wh*-element) unpronounced.

Case (58)c would continue to be excluded, correctly: If the special spell-out option (59') is not taken, the whole structure is pronounced. If option (59') is taken, the spelled-out constituent will be $Subj_1$ or $Subj_2$ in (60), yielding cases (58)b or d respectively. But there is simply no way in this system to spell out the *wh*-element and not spell out the subject, so that (58)c will continue to be excluded. In this system, the logic of truncation is fully preserved (one cannot express a higher position without also expressing a lower position), but shifted from

structure building to the spell-out mechanism, operating in otherwise complete structural representations.

What is special about the root environment is not, in this approach, the fact that different categories may count as possible root nodes, as in traditional truncation, but rather the fact that the spell-out mechanism has more options in root than in non-root environments, so that it may be possible to "pronounce less" at the root, in otherwise uniform structural representations.

The revised interpretation of truncation in terms of spell-out can be extended to the cases of *wh*-drop discussed in Section 6 and quite widely attested across child languages. Suppose that child grammar incorporates a spell-out rule like (61), which is identical to the SubjP spell-out rule in (59') but targeting a higher projection:

(61) In root clauses, spell-out can stop at FocP.[11]

We can now strengthen and generalize the discussion of (60) and suggest that, in general, child grammar can interpret either the higher or the lower occurrences of a structure as the target of rules such as (59') or (61). If the higher occurrence of FocP is targeted, we obtain *wh*-drop, just as targeting $Subj_2$ in (60) yields subject drop. Both *wh*-drop and subject drop involve building the complete structure, but allowing spell-out to stop lower than the root.

One might ask whether there are adult languages that share with child languages the options of (a) allowing spell-out to stop lower than the root and (b) interpreting the lower, rather than the higher, occurrence of a phrasal label as the "maximal" one. In addition to the aux-drop phenomenon studied by Fitzpatrick (2006), the phenomenon of topic drop immediately comes to mind: The root clause is "truncated"—under the revised formulation—at the level of the lowest occurrence of TopP.[12]

8. Null subjects and yes/no questions in JC

We can now turn to yes/no questions and determine to what extent this construction is consistent with null subjects in child JC. Of the 2,501 interrogative utterances in our corpus during the stage where null subjects are robustly attested, 1,153 (46.1%) are yes/no questions, as exemplified in (62) to (65):

(62) *Yuu bai i?* (KEM 2;06)
2sg buy it
'Did you buy it?'

(63) *Yo mek im paas?* (ALA 2;05)
2sg make 3sg pass
'Did you allow him to pass?'

(64) *Im a wiet pahn yo?* (COL 2;08)
3sg PROG wait on 2sg
'Is he waiting on you?'

(65) *Yaa kil im?* (RJU 2;03)
2sg~PROG kill 3sg
'Are you killing it?'

We observed that subjects can be freely dropped with yes/no questions as exemplified in (66)–(69).

[11]Following Rizzi (1997), we assume that FocP is the left-peripheral projection housing the *wh*-expression in its Specifier.

[12]We may speculate that the extra freedom of the root environment relates to the adjacency between the highest structure of the clause and the structure of discourse, which may enhance recoverability of unpronounced material, an intuition which the current approach shares with previous views of truncation. We will not attempt here to connect the spell-out instruction (59') with spell-out mechanisms assumed in phase theory (Chomsky 2001; Nissenbaum 2000; Rizzi 2005, 2006), nor with more detailed cartographic representations of the left periphery. We intend to go back to these aspects in future work.

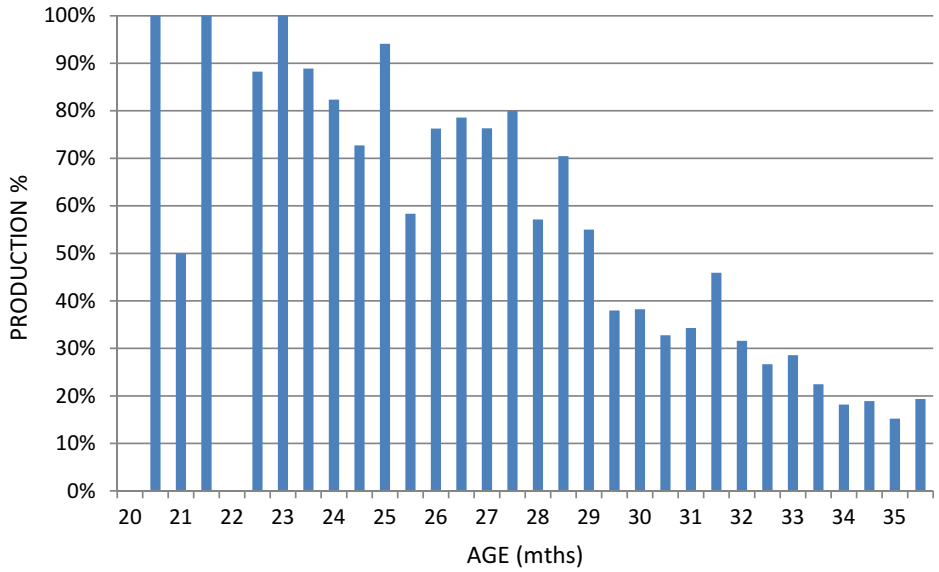


Figure 9. Percentage production of null subjects in yes/no questions.

(66) ___ ___ *jrap?* (TYA 2;01)
(1sg) (PROS) drop
'Am I going to fall?'

(67) ___ ___ *rait pan buk?* (SHU 2;02)
(1sg) (INF) write on book
'Am I to write on the book?'

(68) ___ ___ *bon yo?* (KEM 2;02)
(3sg) (MOD) burn 2sg
'Will it burn you?'

(69) ___ *kyaahn kom aaf* (RJU 2;03)
(3sg) can't come off
'Can't it come off?'

As evidenced from the data (see Appendix E), of the 1,153 yes/no questions involving a verbal element, a total of 542 (47%) have omitted the subject. Thus, the rate of null subjects in yes/no questions is roughly on par with that found in declarative utterances, which have 36.7% (4,574 of 12,463) null subjects. Additionally, like in the production of null subjects with declaratives, we observe a gradual decline in the production of null subjects with yes/no questions, as shown in Figure 9.

This strong parallelism between declaratives and yes/no questions is expected under the approach to the revised privilege of the root sketched out in section 7. Under this approach, like *wh*-interrogatives, both declaratives and yes/no questions are complete CPs (with the declarative and interrogative force explicitly expressed in dedicated positions in the left periphery, if one adopts cartographic representations of Rizzi 2007). Such markers do not correspond to overt morphemes in the target language; in both cases it is always possible to choose the spell-out option expressed by (59'), hence have a null subject. The computation then continues past the spell-out point to integrate the subject DP and the whole left periphery, including the appropriate force marker of yes/no interrogatives.

9. Summary and conclusion

Figure 10 summarizes our findings on the distribution of null subjects in four crucial environments in child JC: declarative clauses, constituent questions with an overt *wh*-element, yes/no questions, and constituent questions with a null *wh*-element.[13]

What immediately sticks out from this figure is the virtual absence of null subjects in the environment following an overt *wh*-element. This fact, and the sharp contrast with the robust attestation of null subjects in declaratives, gives strong support to the view that early null subjects are cases of root subject drop, a manifestation of the more general phenomenon dubbed "the privilege of the root," permitting an exceptional freedom in not pronouncing the initial edge of the clause, with distinct manifestations in adult and child systems (Rizzi 1992, 2006). This conclusion is also supported by the contrast between a high rate of (initial) subject drop and a low rate of obligatory object drop (section 4). In addition to constituent questions with an overt *wh*-element, child JC, much as other child languages, also manifests sizable numbers of constituent questions that appear to involve a null *wh*-element, plausibly another manifestation of the privilege of the root. If the virtual absence of subject omission in overt post-*wh* environments (second bar in Figure 10) is immediately predicted by the traditional truncation approach, expressed in terms of radical absence of the higher layers of the clausal structure, the significant attestation of null subjects after constituent questions plausibly involving a null *wh*-element (fourth bar in Figure 10) is not: In such cases, the syntactic computation (movement of the null *wh*-element) must be able to target a position higher than the position of the null subject. The generalization remains correct, though, that early null subjects cannot be preceded by an overt element. This observation led us to explore a revision of the truncation approach in terms of the spell-out mechanism rather than of the structure-building operations. In the revised approach the spell-out mechanism has more options in root environments, so that it may be possible to "pronounce less" at the root, thereby allowing the initial chunk of the clause to remain unpronounced: This is consistent with more unpronounced structural layers in the initial part of the structure, as in the case of null *wh*-elements followed by null subjects. The spell-out approach to truncation and the privilege of the root are also consistent with the high proportion of null subjects found in declaratives and yes/no questions in child JC.

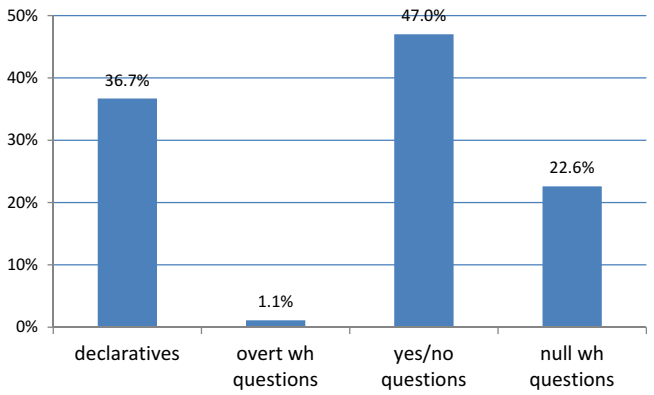


Figure 10. Distribution of null subject.

[13]One limitation of the study is that no adult data were analyzed so as to establish the frequency of the relevant phenomena studied in the input. Further investigation of the input data, and their role in the null subject phenomenon as argued for in the current work, will be addressed in future research.

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Appendix A: Individual production of null subjects

Table A1. COL'S Null Subjects

AGE (M;D)	UTTERANCES	NULL SUBJ	%NULL SUBJ
20;17	24	15	62.50%
20;27	27	17	62.96%
21;17	34	21	61.76%
21;28	53	32	60.38%
22;08	36	18	50.00%
23;01	47	29	61.70%
23;12	56	39	69.64%
23;28	60	36	60.00%
24;12	47	26	55.32%
24;28	70	39	55.71%
25;14	75	45	60.00%
26;00	46	28	60.87%
26;16	155	85	54.84%
27;01	98	44	44.90%
27;16	103	65	63.11%
27;30	113	54	47.79%
28;15	92	34	36.96%
29;00	100	25	25.00%
29;14	71	23	32.39%
29;27	127	33	25.98%
30;10	72	21	29.17%
30;25	207	26	12.56%
31;08	156	40	25.64%
31;22	113	31	27.43%
32;06	178	51	28.65%
32;20	179	24	13.41%
33;11	68	23	33.82%
33;24	87	23	26.44%
34;10	116	24	20.69%
34;21	122	30	24.59%
35;07	130	19	14.62%

Table A2. ALA'S Null Subjects

AGE (M;D)	UTTERANCES	NULL SUBJ	%NULL SUBJ
21;25	47	31	65.96%
22;04	33	27	81.82%
22;25	101	86	85.15%
23;0	88	72	81.82%
23;16	82	62	75.61%
24;09	97	60	61.86%
24;20	62	53	85.48%
25;05	87	76	87.36%
25;20	85	53	62.35%
26;06	116	69	59.48%
26;22	187	82	43.85%
27;08	44	11	25.00%
27;24	130	61	46.92%
28;9	121	69	57.02%
28;24	151	54	35.76%
29;07	111	25	22.52%
29;23	249	58	23.29%
30;12	80	13	16.25%
30;22	74	9	12.16%
31;05	178	15	8.43%
31;18	172	16	9.30%
32;02	278	32	11.51%
32;16	188	7	3.72%
33;00	160	13	8.13%
33;14	159	19	11.95%
33;28	160	12	7.50%
34;25	173	13	7.51%
35;01	159	28	17.61%
35;18	155	25	16.13%

Table A3. RJU'S Null Subjects

AGE (M;D)	UTTERANCES	NULL SUBJ	%NULL SUBJ
22;04	8	7	87.50%
22;14	14	13	92.86%
23;04	68	54	79.41%
23;15	17	8	47.06%
23;26	20	16	80.00%
24;19	44	30	68.18%
24;30	70	50	71.43%
25;15	95	46	48.42%
26;00	112	72	64.29%
26;16	64	26	40.63%
27;01	169	67	39.64%
27;18	157	57	36.31%
28;04	89	29	32.58%
28;19	99	38	38.38%
29;03	91	41	45.05%
29;17	112	45	40.18%
30;02	116	25	21.55%
30;18	126	33	26.19%
31;05	195	32	16.41%
31;15	172	29	16.86%
31;28	112	25	22.32%
32;12	183	47	25.68%
32;26	117	23	19.66%
33;10	142	51	35.92%
33;24	110	26	23.64%
34;07	109	15	13.76%
34;29	74	24	32.43%
35;11	84	24	28.57%

Table A4. TYA'S Null Subjects[14]

AGE (M;D)	UTTERANCES	NULL SUBJ	%NULL SUBJ
23;25	11	9	81.82%
24;04	25	23	92.00%
24;25	9	6	66.67%
25;05	36	33	91.67%
25;16	18	16	88.89%
26;09	13	8	61.54%
26;20	28	24	85.71%
27;5	22	20	90.91%
27;20	14	12	85.71%
28;06	20	15	75.00%
28;22	14	11	78.57%
29;8	7	7	100.00%
29;24	19	15	78.95%
30;09	15	6	40.00%
30;24	50	26	52.00%
31;07	2	1	50.00%
31;23	43	21	48.84%
32;08	74	34	45.95%
32;22	29	9	31.03%
33;05	64	20	31.25%
33;18	13	7	53.85%
34;02	48	11	22.92%
34;16	44	11	25.00%
35;00	69	12	17.39%
35;14	99	12	12.12%

Table A5. KEM'S Null Subjects

AGE (M;D)	UTTERANCES	NULL SUBJ	%NULL SUBJ
24;21	83	64	77.11%
25;00	88	71	80.68%
25;21	87	82	94.25%
26;01	87	82	94.25%
26;12	132	124	93.94%
27;05	111	96	86.49%
27;16	92	77	83.70%
28;01	129	81	62.79%
28;16	74	58	78.38%
29;02	83	61	73.49%
29;18	121	100	82.64%
30;04	90	41	45.56%
30;20	125	56	44.80%
31;05	192	72	37.50%
31;20	151	58	38.41%
32;03	138	28	20.29%
32;19	142	10	7.04%
33;04	195	24	12.31%
33;18	141	23	16.31%
34;01	76	13	17.11%
34;14	125	31	24.80%
34;29	221	44	19.91%
35;12	141	33	23.40%

[14]In the recording at 31;07 TYA was ill with the chickenpox (varicella) virus and was not very talkative. She produced mainly nonverbal single-word utterances. Only utterances containing a verb were included in this analysis, hence the lack of data.

Table A6. SHU'S Null Subjects

AGE (M;D)	UTTERANCES	NULL SUBJ	%NULL SUBJ
25;23	77	23	29.87%
26;02	99	16	16.16%
26;11	46	11	23.91%
27;03	91	52	57.14%
27;14	119	52	43.70%
28;07	30	3	10.00%
28;18	28	2	7.14%
29;03	46	9	19.57%
29;18	137	30	21.90%
30;04	132	29	21.97%
30;20	110	13	11.82%
31;16	100	25	25.00%
31;22	99	21	21.21%
32;07	97	8	8.25%
32;22	64	6	9.38%
33;05	110	10	9.09%
33;21	142	15	10.56%
34;06	74	16	21.62%
34;20	26	1	3.85%
35;03	122	13	10.66%
35;16	64	9	14.06%

Appendix B: Production of overt *WH* and null subjects[15]

AGE	COL WH		ALA WH		RJU WH		TYA WH		KEM WH+SUBJ		SHU WH		TOTAL WH	
(MTHS)	+SUBJ	–SUBJ	+SUBJ	–SUBJ	+SUBJ	–SUBJ	+SUBJ	–SUBJ	+SUBJ	–SUBJ	+SUBJ	–SUBJ	+SUBJ	+SUBJ
20	0	0											**0**	**0**
20.5	0	0											**0**	**0**
21	0	0											**0**	**0**
21.5	0	0	1	0									**1**	**0**
22	0	0	2	0	0	0							**2**	**0**
22.5	2	0	1	0	0	0							**3**	**0**
23	2	0	0	0	0	0							**2**	**0**
23.5	0	0	8	0	2	0	0	0					**10**	**0**
24	0	0	12	0	0	0	0	0					**12**	**0**
24.5	1	0	4	0	2	0	0	0	0	0			**7**	**0**
25	0	0	6	0	0	0	0	0	0	0			**6**	**0**
25.5	0	0	1	0	1	0	0	0	0	0	2	0	**4**	**0**
26	2	0	9	0	0	0	1	0	0	0	8	0	**20**	**0**
26.5	3	0	7	0	1	1	0	0	0	0	3	1	**14**	**2**
27	0	0	9	0	3	0	0	0	0	0	3	0	**15**	**0**
27.5	2	0	14	1	4	0	1	0	0	0	4	0	**25**	**1**
28	1	0	4	0	7	0	0	0	1	0	4	0	**17**	**0**
28.5	0	0	10	4	5	0	0	0	0	0	4	0	**19**	**4**
29	1	0	3	0	6	0	0	0	0	0	9	0	**19**	**0**
29.5	8	1	20	0	0	0	0	0	0	0	17	0	**45**	**1**
30	1	0	5	0	6	0	0	0	1	0	15	0	**28**	**0**
30.5	17	0	4	0	17	0	4	0	1	0	15	1	**58**	**1**
31	2	0	13	0	47	1	0	0	19	0	13	0	**94**	**1**
31.5	5	0	18	0	25	0	0	0	11	0	13	0	**72**	**0**
32	13	0	25	0	1	0	3	0	1	0	13	0	**56**	**0**
32.5	3	0	15	0	11	0	3	0	3	0	9	0	**44**	**0**
33	3	0	14	0	18	0	5	0	17	0	29	0	**86**	**0**
33.5	5	0	15	0	12	0	1	0	6	0	28	0	**67**	**0**
34	1	0	14	0	10	0	2	0	3	0	11	0	**41**	**0**
34.5	2	0	10	0	8	0	1	0	4	0	2	0	**27**	**0**
35	8	0	7	0	2	0	2	0	18	0	33	0	**70**	**0**
35.5			7	0	4	0	5	0	6	0	4	0	**26**	**0**
	82	**1**	**258**	**5**	**192**	**2**	**28**	**0**	**91**	**0**	**239**	**2**	**890**	**10**

[15]In this table and throughout the article, +subj means "overt subject," and –subj means "null subject."

Appendix C: Production of declaratives and null subjects

AGE	COL DEC		ALA DEC		RJU DEC		TYA DEC		KEM DEC		SHU DEC		TOTAL DEC	
(MTHS)	+SUBJ	−SUBJ	+SUBJ	−SUBJ	+SUBJ	−SUBJ	+SUBJ	−SUBJ	+SUBJ	−SUBJ	+SUBJ	−SUBJ	+SUBJ	−SUBJ
20	9	15											**9**	**15**
20.5	10	16											**10**	**16**
21	12	20											**12**	**20**
21.5	21	31	12	26									**33**	**57**
22	18	18	4	27	1	7							**23**	**52**
22.5	15	29	10	71	1	13							**26**	**113**
23	15	39	5	61	13	53							**33**	**153**
23.5	24	35	8	56	6	7	2	9					**40**	**107**
24	18	25	20	48	4	16	2	21					**44**	**110**
24.5	27	36	5	51	12	29	3	5	19	62			**66**	**183**
25	29	41	5	74	19	43	3	33	17	66			**73**	**257**
25.5	15	28	30	46	45	42	2	15	4	80	50	22	**146**	**233**
26	66	82	32	38	37	64	4	8	5	79	67	14	**211**	**285**
26.5	50	39	86	54	36	23	4	24	7	110	29	9	**212**	**259**
27	38	61	20	7	96	65	2	20	15	83	31	44	**202**	**280**
27.5	56	52	45	33	93	53	1	12	12	71	61	44	**268**	**265**
28	54	31	43	58	44	22	5	15	35	73	21	3	**202**	**202**
28.5	74	24	77	42	55	37	3	11	14	34	18	2	**241**	**150**
29	44	23	75	16	40	38	0	7	21	51	23	8	**203**	**143**
29.5	75	29	153	52	53	37	4	15	19	88	74	25	**378**	**246**
30	49	21	61	12	77	20	9	6	34	37	74	22	**304**	**118**
30.5	139	22	53	9	59	28	19	24	65	45	66	9	**401**	**137**
31	97	35	132	13	95	26	1	1	91	66	51	13	**467**	**154**
31.5	72	29	130	15	103	26	21	21	81	47	53	6	**460**	**144**
32	106	48	191	23	77	22	35	32	105	23	71	5	**585**	**153**
32.5	138	21	140	3	114	36	16	9	127	8	44	6	**579**	**83**
33	39	23	121	12	67	17	38	20	146	20	62	9	**473**	**101**
33.5	55	22	106	17	66	47	5	7	108	22	93	11	**433**	**126**
34	84	20	113	11	68	25	35	11	59	12	44	12	**403**	**91**
34.5	74	24	134	11	85	15	32	11	89	31	23	1	**437**	**93**
35	95	18	117	25	45	23	55	12	145	42	69	12	**526**	**132**
35.5			113	22	54	22	79	11	96	33	47	8	**389**	**96**
	1618	**957**	**2041**	**933**	**1465**	**856**	**380**	**360**	**1314**	**1183**	**1071**	**285**	**7889**	**4574**

Appendix D: Production of null *WH* and null subjects

AGE	COLIN YES/NO		ALANA YES/NO		RJU YES/NO		TYA YES/NO		KEMYES/NO		SHU YES/NO		TOTAL YES/NO	
(mths)	– SUBJ	+SUBJ	+SUBJ	– SUBJ	+SUBJ	– SUBJ	+SUBJ	– SUBJ	+SUBJ	– SUBJ	+SUBJ	– SUBJ	+SUBJ	– SUBJ
20	0	0											**0**	**0**
20.5	0	0											**0**	**0**
21	0	0											**0**	**0**
21.5	0	0	3	0									**3**	**0**
22	0	0	0	0	0	0							**0**	**0**
22.5	0	0	3	0	0	0							**3**	**0**
23	0	0	11	0	1	1							**12**	**1**
23.5	0	0	4	0	0	0	0	0					**4**	**0**
24	0	0	5	1	0	0	0	0					**5**	**1**
24.5	0	1	0	0	0	0	0	0	0	0			**0**	**1**
25	0	0	0	0	1	2	0	0	0	0			**1**	**2**
25.5	0	0	0	0	0	1	0	0	0	0	0	0	**0**	**1**
26	1	1	2	1	0	0	0	0	0	0	2	0	**5**	**2**
26.5	1	4	4	2	0	0	0	0	1	0	0	0	**6**	**6**
27	0	1	1	0	0	0	0	0	0	0	2	1	**3**	**2**
27.5	0	0	5	5	1	0	0	0	3	0	0	2	**9**	**7**
28	1	0	0	0	2	0	0	0	7	1	0	0	**10**	**1**
28.5	1	1	3	1	0	0	0	0	0	1	1	0	**5**	**3**
29	1	0	0	0	2	0	0	0	0	1	0	0	**3**	**1**
29.5	6	0	3	1	1	1	0	0	0	1	2	1	**12**	**4**
30	1	0	0	0	3	0	0	0	10	0	3	4	**17**	**4**
30.5	22	2	0	0	2	0	0	1	1	3	6	0	**31**	**6**
31	11	1	1	0	8	2	0	0	6	2	5	1	**31**	**6**
31.5	2	1	0	0	2	0	1	0	0	1	4	2	**9**	**4**
32	3	0	2	1	0	0	1	0	0	0	0	0	**6**	**1**
32.5	0	0	1	0	2	0	0	0	0	0	1	0	**4**	**0**
33	1	0	1	0	6	0	1	0	0	0	3	0	**12**	**0**
33.5	1	0	0	0	7	0	0	0	0	1	0	0	**8**	**1**
34	0	1	0	0	1	0	0	0	0	0	1	2	**2**	**3**
34.5	3	1	0	0	1	0	0	0	0	0	0	0	**4**	**1**
35	0	0	0	0	0	0	0	0	0	0	0	1	**0**	**1**
35.5			0	0	0	0	0	1	0	0	0	0	**0**	**1**
	55	**14**	**49**	**12**	**40**	**7**	**3**	**2**	**28**	**11**	**30**	**14**	**205**	**60**

Appendix E: Actual production of null subjects with yes/no questions

AGE	COL –WH		ALA –WH		RJU –WH		TYA –WH		KEM –WH		SHU –WH		TOTAL –WH	
(MTHS)	+SUBJ	–SUBJ	+SUBJ	–SUBJ	+SUBJ	–SUBJ	+SUBJ	–SUBJ	+SUBJ	–SUBJ	+SUBJ	–SUBJ	+SUBJ	–SUBJ
20	0	0											0	0
20.5	0	1											0	1
21	1	1											1	1
21.5	0	1	0	5									0	6
22	0	0	0	0	0	0							0	0
22.5	1	0	1	15	0	0							2	15
23	0	0	0	11	0	0							0	11
23.5	0	1	0	6	1	1	0	0					1	8
24	3	1	0	11	0	0	0	2					3	14
24.5	3	2	0	2	0	1	0	1	0	2			3	8
25	1	4	0	2	0	5	0	0	0	5			1	16
25.5	3	0	1	7	3	3	0	1	1	2	2	1	10	14
26	1	2	4	30	3	8	0	0	0	3	6	2	14	45
26.5	0	1	8	26	1	2	0	0	0	14	3	1	12	44
27	0	3	3	4	3	2	0	0	0	13	3	7	9	29
27.5	1	2	5	22	2	4	0	0	0	6	2	6	10	40
28	2	3	5	11	7	7	0	0	5	7	2	0	21	28
28.5	0	0	7	7	1	1	0	0	2	23	3	0	13	31
29	2	0	8	9	2	3	0	0	1	9	5	1	18	22
29.5	5	3	15	5	13	7	0	0	2	11	14	4	49	30
30	0	0	1	1	5	5	0	0	4	4	11	3	21	13
30.5	3	2	8	0	15	5	1	1	2	8	10	3	39	19
31	6	4	17	2	13	3	0	0	4	4	6	11	46	24
31.5	3	1	8	1	13	3	0	0	1	10	8	13	33	28
32	5	3	28	8	9	3	1	2	4	5	5	3	52	24
32.5	14	3	25	4	9	11	1	0	2	2	4	0	55	20
33	2	0	11	1	3	6	0	0	8	4	6	1	30	12
33.5	3	1	19	2	6	4	0	0	4	0	6	4	38	11
34	7	3	21	1	5	1	0	0	1	1	2	2	36	8
34.5	13	5	16	2	0	0	0	0	1	0	0	0	30	7
35	8	1	7	3	3	1	0	0	14	2	7	0	39	7
35.5	87	48	10	3	2	2	3	0	6	0	4	1	25	6
TOTAL			228	201	119	88	6	7	62	135	109	63	611	542