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# Acceleration in multilingual children: the case of French

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#### ABSTRACT

The acquisition of the null-subject property has received much attention. Languages differ as to whether they allow (pronominal) subjects to be unexpressed. French is generally assumed to be a language not allowing nullsubjects, while languages like Italian and European Portuguese are treated as null-subject languages. The present study locates these language types within the null-argument hierarchy. This hierarchy "emerges" through the interaction of (non-language specific) cognitive strategies and linguistic features. In such a hierarchy, Italian and European Portuguese are less marked than French. The study of the longitudinal data of three Italian/Portuguese-French bilingual children between the age of 1;0 to 5;0 shows that bilingual children can reach the French target grammar more quickly than monolingual Frenchspeaking children, even if they have a "weak" language. The children are accelerated with respect to (pronominal) subject realizations and target-like inflection of finite verbs. The findings indicate that bilingual children are not statistical learners, but they can rely on prior knowledge attained in their respective other, radically different, and less marked language. Consequently, educational programs with a focus on multilingualism (like pedagogical translanguaging) which aim to activate prior linguistic knowledge can be effective to compensate for disadvantages related to critical periods.

# **KEYWORDS**

Cognitive (not language-specific) strategy; elsewhere form; grammatical feature; romance languages; subject realization

# Introduction

Languages differ regarding the possibility to omit the subject of a sentence: some languages allow the subject in finite clauses not to be expressed, the so-called Null-Subject languages (henceforth NSL) or prodrop languages, other languages require an overt subject, the so-called Non-Null-Subject languages (NNSL) (Santos & Lopes, 2017, p. 169). Although a great number of studies have been carried out on languages like Italian and English within the last forty years, the NS property still needs to be considered thoroughly - in linguistic theory and in acquisition. Hyams (2011, p. 47) concludes that "the jury is still out on the correct analysis of early null subjects, but it is clear that the phenomenon is vastly more complex than was initially assumed." To date, Hyams (2011) conclusions are valid if it comes to language acquisition.

The present study will contribute to the acquisition of the NS property by giving up on the binary distinction between NSLs and NNSLs to account for the variation seen in the different languages (Roberts, 2019) and in acquisition. It will also give up on the view of the monolingual child as the norm, against which the multilingual child's path has been measured. For many years, language acquisition research has been concerned with the acquisition of a language in a monolingual setting. The route of the monolingual child has been assumed to be the norm. Under this perspective, the vast majority of studies on simultaneously multilingual children have fed the language-as-problem

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(Ruiz, 1984, p. 16) view of language planners. Recently, a handful of studies have observed an acceleration effect in bi- and even trilingual children in comparison to monolingual peers. This effect is observed even if the languages radically (parametrically) differ (see Müller, 2024 for an overview, Scalise et al., 2021 for an example). The present study will ask the question whether acceleration is also possible if the child has a "weak" language and whether acceleration in one grammatical domain entails acceleration in another, though related domain.

The current research considers NSLs and NNSLs throughout the language acquisition process, with a focus on the NNSL French combined with the NSLs Italian and (European) Portuguese. Beginning with a brief illustration of the NS property, section 'Parameters as hierarchies of markedness' focusses on the markedness of French in relation to Italian and European Portuguese, relying on parameter hierarchies as proposed in Biberauer et al. (2014). Section 'Acquisition of the (non-)null-subject property by monolingual children' summarizes the results of (pronominal) subject use and use of finite inflectional morphology by monolingual French-speaking children. Section 'Acquisition of the (non-)null-subject property by multilingual children' is a summary of the results from multilingual children and presents the research questions and expectations. Data and methods are provided in section 'Data and methods', results are presented in section 'Results'. Section 'Discussion' discusses the results in the light of a combined cognitive-linguistic approach to parameters and against an approach of statistical learning. formulates an outlook with respect to future educational programs.

# Parameters as hierarchies of markedness

Within an approach to language which postulates an innate language faculty that enables any individual to acquire a natural language, Universal Grammar (UG, Chomsky, 1986), the modeling of (syntactic) variation has become a major point of concern. The concept of parameters (Chomsky, 1981), the locus of variation, as switches between binary values has been criticized both from a theoretical and an empirical perspective: innate UG conceived of as the repository of the major syntactic machinery (like the operation Merge) and (probably) the grammatical features (for a discussion cf. Wiltschko, 2014) does not belong to the duplicated parts of the language faculty (MacSwan, 2000, p. 44) and consequently cannot be the locus of syntactic variation as expressed by parameters. In addition, the empirical acquisition data were not compatible with the switch box view of parameters (Valian, 1990), according to which children will select one of two values of a parameter during the process of language acquisition. To legitimate the notion of parameter against a simple "grammar rule" (Newmeyer, 2004, p. 211), parameter settings were argued to have vast consequences for other domains of the grammar known as "clustering of properties" (Chomsky, 1981; Rizzi, 1982; cf. subsection 2.2). But Roberts (2019, p. 195) points out that the cluster is not sufficiently capable of making broader cross-linguistic statements, since there are also languages that appear to be "in between" NSLs and NNSLs.<sup>1</sup>

One way to account for the state of "being in between" is to view parameters as cognitive subroutines which "emerge" through the interaction of cognitive optimization strategies, not specific to language, fed by grammatical features (Biberauer et al., 2014). In contrast to the former switch box concept, parameters not only express the (non)relevance of a syntactic feature, but they also determine the feature's extent of relevance with respect to syntactic categories. Viewed as cognitive subroutines, parameters belong to the non-duplicated – or dependent (MacSwan, 2000, p. 37) – part of the language faculty since they occur singularly in the bilingual's language competence.

Biberauer et al. (2014, p. 209) and Roberts (2019, p. 88) present a hierarchy of parameters,<sup>2</sup> consisting of macro-, meso-, micro-, and nano-parameters, with macro-parameters forming the top

<sup>&</sup>lt;sup>1</sup>An example of one of these languages classified "between" NSLs and NNSLs is the Brazilian variety of Portuguese (cf.Lobo, 2016; Holmberg, 2010; among others).

<sup>&</sup>lt;sup>2</sup>Formally, these parameters differ only in the size of the set of heads that have the same properties: for macroparameters, this is the maximum set; for mesoparameters, a large natural class; for microparameters, a small natural class; and for nanoparameters, either a very small, not necessarily natural class of elements or the minimum set of an element (Roberts, 2019, p.85).

of a (parameter) hierarchy and expressing the presence (everywhere) or absence of a grammatical feature (nowhere relevant in the grammatical system). The hierarchy is gone through by the child starting at the top and proceeding further down until a point is reached when the child's setting is no longer contradicted by the input.<sup>3</sup> Cognitive (non-language specific) optimization strategies account for why the child proceeds top-down in the hierarchy (Biberauer, 2019).

One of the hierarchies discussed by Biberauer et al. (2014) and Roberts (2019) is the nullargument hierarchy in Figure 1, to be presented in detail in the following subsections. The linguistic features responsible for licensing null arguments in syntax are the so-called phi-features like person, gender, number (Rizzi, 1986). Languages differ as to whether and to what extent they allow arguments to be dropped. To this end, Roberts and Holmberg (2010) present a three-part typology of NSLs: radical NSLs (Japanese, Basque, etc.), consistent (Italian, European Portuguese, etc.), and partial (German, etc.) (Roberts, 2019, p. 199).

Phi-features are relevant .....



Figure 1. Null-argument hierarchy, following Roberts (2019).

#### Radical argument-drop languages

There are two kinds of Radical Argument-Drop Languages (RADLs). Japanese is of the first type where arguments can be omitted of any kind if they are recoverable via discourse. RADLs are also characterized by the lack of agreement inflection on the verb (Roberts, 2019, p. 223), illustrated in examples (1a) and (1b).

The second type of RADLs is represented by Basque. Basque allows null (pronominal) subjects to co-occur with direct and indirect null (pronominal) objects, as in example (2b). In contrast to languages without phi-features like Japanese, Basque exhibits rich inflectional morphology to recover

<sup>&</sup>lt;sup>3</sup>This view is compatible with Valian (1990, p.115) who suggested that the child initially holds both "+" and "-"values of the null subject parameter.

the content of any empty argument. Roberts (2019, p. 226) reports that arguments can be omitted except in contrastive settings.

John-ga Mary-o nagutta to itta
 John(Nominative) Mary(Accusative) hit that said
 'John said that (he) hit Mary'

(Zushi, 2003, p. 575).

- (2) (a) Nik Mireni nire lankideak aurkeztu dizkiot (Duguine, 2013, p. xi)
  I(Ergative) Miren(Dative) (Possessive) colleagues(Absolutive) present(3PluralAbsolutive)
  Auxiliary(3SingularDative1SingularErgative)
  'I have presented my colleagues to Miren.
  - (b) aurkeztu dizkiot (Duguine, 2013, p. xii) present(3PluralAbsolutive) Auxiliary(3SingularDative1SingularErgative)
     'I have presented them to her.'

# Consistent null subject languages

In contrast to Basque, Italian and European Portuguese (EP) are classified as Consistent Null Subject Languages (CNSLs, Roberts, 2019, p. 250). As such, they conform to the Chomsky-Rizzi cluster as presented in Roberts (2019, p. 194). Due to space limits, we will present only three properties of the cluster.

The first property is the occurrence of a silent (pronominal) subject in finite clauses in any person-number combination and in any tense, as long as it is contextually given, as in (3) for EP:

(3) Leonor to Filipe: Estou triste (Lobo, 2016, p. 563) Am(1SingularPresentTense) sad 'I am sad.'

Secondly, CNSLs exhibit rich agreement morphology on verbs as in (4) for Italian and in (5) for EP.

- (4) (a) Bevo, bevi, beve, beviamo, bevete bevono (Roberts, 2019, pp. 199, 250)
  - (b) bebo, bebes, bebe, bebemos, bebeis, bebem
  - (I) drink, (you) drink, (he/she/it) drinks, (we) drink, (you) drink., (they) drink.

Thirdly, Italian and EP allow for inversion of the subject in most contexts.

- (5) (a) Chi ha telefonato? Credo che abbia telefonato Gianni (Rizzi, 1990, p. 62)
  - (b) Quem tem telefonado? Acho que tem telefonado João

Who has telephoned? (I) believe that has telephoned John

'Who called? - I believe that John called.'

# Partial null subject languages

Among the distinctive properties of Partial NLSs (PNSLs) are person restrictions on silent (pronominal) subjects, the not necessarily very rich inflection of finite verbs, and the absence of a general option of "free inversion" (Roberts, 2019, p. 207). Two well-studied PNSLs are Finnish and Brazilian Portuguese (BP). Holmberg (2005, p. 539) finds that Finnish does not allow definite 3rd person zero subjects in main clauses in out-of-the-blue contexts. According to Trutkowski (2016), (spoken) German is a PNSL which exhibits 1rst and 2nd person null subjects which are grammatical out of the blue, while 3rd person subject gaps are ungrammatical.

Komme/Kommst/\*Kommt leider immer zu spät (Trutkowski, 2016, p. 9)
 Come(1Singular)/(2Singular)/(3Singular) unfortunately always too late
 'I/You/He, she, it come(s) unfortunately always too late.'

# The case of French

Let us finally turn to French, generally characterized as a NNSL. Following Patuto (2012, p. 231), subject omissions are not legitimate with referential subjects of any person and number. However, Patuto (2012, pp. 224, 230) observes 5.8% of omissions of the expletive *il* "it" with impersonal verbs in (spoken) French. One example is (7).

- (7) Faut pas sortir par le four, hein? (Culbertson & Legendre, 2014, p. 83) Must(3Singular) not leave through the oven, huh?
  - 'You don't have to go out through the oven, do you?'

In other words, overt subjects occur in almost 94% of (spoken) French utterances. They are obligatory with referential arguments.

In contrast to the Romance languages Italian and EP, French does not exhibit rich agreement morphology on finite verbs. Marty (2001, p. 220) shows that the Nouveau Petit Robert of 1996 contains 6406 verbs (types). As for spoken French, 99.95% have the same form for 1rst, 2nd and 3rd person singular in the present tense; 90.34% have the same form for 1rst, 2nd, 3rd person singular and 3rd person plural in the present tense. Only 617 verbs (9.66%) make a distinction between 3rd person singular and plural.

Contrasting with the Romance languages Italian and EP, free inversion of the subject is ungrammatical in (spoken) French, illustrated in (8).

(8) Qui a téléphoné? – Je crois que \*(Jean) a téléphoné (\*Jean)

'Who has telephoned? I believe that John has telephoned (\*John).'

#### Summary for monolingual language acquisition

With regard to monolingual French children, the parameter hierarchy enables to formulate the following expectations: based on Figure 1, the route to French is longer than the route to Italian and EP. Accordingly, we predict that monolingual French-speaking children take longer to acquire that their language is a NNSL than Italian- and EP-speaking children do with respect to the NS property.

#### Parameter hierarchies and multilingual children

Müller (2024) argues that the hierarchy as illustrated in Figure 1 for null arguments has to be supplemented from the perspective of a multilingual child. Parameters as cognitive subroutines fed by grammatical features belong to the non-duplicated component of the language faculty, hence to the properties that are shared by the two languages in the bilingual's mind. Starting from the fact that multilingual children are able to separate and control their different languages (Meisel, 1994, 2007; Paradis & Genesee, 1996), even if they have less exposure in one of them, and taking the perspective of cross-linguistic influence at the competence level (Müller & Hulk, 2001), she argues in favor of two cognitive acquisition strategies: One is fed by a grammatical feature and requires the child to (re-)use already acquired knowledge by generalizing to new domains (Biberauer, 2019). The other strategy enables the child to consider rejected alternatives of earlier decisions in one language for use in the other language. An acceleration effect related to the multilingual's linguistic proficiency is indicative of the success of both strategies. Success of strategies is argued to be related to a threshold of language usage from a quantitative or a qualitative perspective.

In other words, a Basque-French bilingual child having acquired that Basque is a RADL (at an MLUw,<sup>4</sup> measured in words, of around 2.0 words, or at an age of 18 months, Ezeizabarrena 2003, 2013) can simultaneously benefit for the acquisition of (radically different) French as a NNSL in that s/he can reject the analysis of Basque as a RADL for the use of (pronominal) subjects in French.

# Acquisition of the (non-)null-subject property by monolingual children

# Italian and EP

Monolingual Italian- and EP-speaking children have been argued to set the null subject parameter extremely early. They produce NSs at the adult level extremely early in acquisition (around an MLUw of 1.5–2.5, Patuto, 2012, p. 295; Valian, 1991 for Italian; Lobo, 2016; Valian & Eisenberg, 1996 for Portuguese), together with rich (and target-like) inflectional morphology and subject inversion (Belletti & Guasti, 2015). It has been claimed that monolingual Italian/EP-speaking children set the null-subject parameter extremely early (Hyams, 2011, p. 18).

# French

Monolingual French children have been shown to pass through a stage where they omit subjects (at least until an MLUw of 3.5–4.5, Jansen, 2015; Pierce, 1992; Prévost, 2009, p. 150ff.; Lutkewitz, 2023; Schneegans, 2022). These amount to 30%–50% of all subjects, with peaks of 60% and 70% (Prévost, 2009, p. 150). Averages of subject omissions can be higher in spontaneous speech (37.9%) than in elicited production (17.9%) (Jakubowicz et al., 1997, p. 335).

At the same time when French children omit (pronominal) subjects, they produce elsewhere forms or default forms (Lutkewitz, 2023; Prévost, 2009, p. 136; Rasetti, 2003). Ferdinand (1996) was the first to observe, although in extremely early stages of language development (the last recording of the three analyzed children is at 2;6,21), that monolingual children use finite verbs "elsewhere" as in the following examples:

- (9) (a) moi a tout bu "I have all drunk" (Ferdinand, 1996, p. 50), adult-like form: ai
  - (b) va voir papa moi "will see daddy I," adult-like form: vais

(c) des motos fait du bruit "the bikes makes of noise," adult-like form: font

Ferdinand (1996, p. 51) notes that "the overgeneralizations occur in one direction only."  $3^{rd}$  person singular forms are used "elsewhere," namely with singular subjects of  $1^{rst}$  or  $2^{nd}$  person subjects or with  $3^{rd}$  person plural subjects. At the same time, the adult-forms occur in child speech, *ai*, *vais*, *font* in the above examples (9).

During the stage when monolingual French children (1) omit subjects and (2) use elsewhere forms, they produce target-deviant postverbal subjects. One example is given in (10).

(10) Lit maman (2;0,1, Nathalie, Déprez & Pierce, 1993, p. 42)

Reads mummy

"Mummy is reading."

# Summary of results from monolingual children

While monolingual Italian/EP-speaking children acquire the NS property (and related properties like rich inflectional morphology and subject inversion) early, monolingual French children pass through a stage of subject omission which is also characterized by the occurrence of elsewhere-forms and postverbal subjects. Therefore, Figure 1 correctly predicts that monolingual French children need time to set the non-null-subject property.

<sup>&</sup>lt;sup>4</sup>MLUw (Mean Length of Utterance in words) is a measure used in language development to calculate the average length of a child's utterances in words. The measure allows to compare children without having to use age as a reference.

# Acquisition of the (non-)null-subject property by multilingual children

# Summary of results from multilingual children

Simultaneous multilingual children<sup>5</sup> who acquire French as one of their languages converge on target-French much earlier than monolingual French children (Arnaus Gil et al., 2021; Jansen, 2015; Scalise et al., 2021), even if they acquire more than two languages simultaneously. The target system is in place from an MLUw of 2.5 onwards (or earlier). This MLUw-value corresponds to the value at which they have reached the target-system in their other language (and at which monolingual children of these languages have attained it). This effect of acceleration in relation to monolingual French children has been observed for French in combination with a CNSL like Italian and Spanish and for French in combination with a PNSL like German.

The simultaneous multilingual children have also been shown to skip the post-verbal subject stage altogether, a stage characteristic of monolingual French children (Arnaus Gil & Müller, 2018; Jansen, 2015).

Until today, only a handful of researchers have been able to observe acceleration effects in multilingual children (cf. Müller, 2024 for an overview). From Kupisch's work (Kupisch, 2006) on determiner omissions in multilingual children's German, we can deduce that acceleration effects occur even if the child's other language is extremely weak. One of the accelerated children in Kupisch's study is Ce\_df (French-German) with a mean MLUw-difference of 1.2 words until the age of 4, i.e. an unbalanced bilingual child with a "weak" language, namely French in this case. Nonetheless, the child is reported to be accelerated with regard to determiner realizations in German. In other words, the accelerated language is being influenced by the "weak" language. Stahnke (2022) reports the absence of faster (obligatory) determiner use in the French of one of two French-Italian children (1;6-3;5). This child (Ju\_fi) uses Italian as a "weak" language and exhibits a mean MLUw-difference of 0.84 words until the age of 4, displaying a clear preference for French. In this case, Italian is not strong enough to accelerate determiner use in French if compared to a monolingual French-speaking child. In sum, the results with respect to language dominance are inconclusive and more children have to be investigated.

To summarize: multilingual children who acquire French as one of their languages may converge much earlier to the target-grammar than monolingual children, although the other language (parametrically) differs from French. In addition to early convergence with respect to subject realizations, their data lack (ungrammatical) postverbal subjects. Relatively balanced bilinguals converge early with respect to obligatory subject realizations in French and their usage does not include (ungrammatical) postverbal subjects. Whether acceleration occurs when one language is extremely weak remains an open question, studies on determiner realization have found conflicting results and obligatory subject realization has yet to be examined.

#### **Research question and hypotheses**

Although previous research has observed an acceleration effect with respect to subject realizations in French in multilingual children who acquire a CNSL or a PNSL together with French and although these children have been found to be accelerated with respect to subject placement as well, it is to date unclear whether this effect can also be measured in multilingual children with a language dominance. Furthermore, the use of elsewhere-forms<sup>6</sup> in relation to (accelerated pronominal) subject use has not been investigated yet.

In what follows, we will analyze subject use and occurrence of elsewhere forms, i.e. verbs occurring with the same default phonological form several times in the paradigm, in children who acquire French together with a CNSL.

We will explore the following hypotheses, as they arise from the literature:

<sup>&</sup>lt;sup>5</sup>There were relatively balanced and unbalanced bilinguals among the children considered in the mentioned studies. However, the issue of balanced vs. unbalanced development has not been discussed yet with regard to acceleration.

<sup>&</sup>lt;sup>6</sup>Elsewhere-form refers to the use of 3<sup>rd</sup> person singular with 1<sup>st</sup> or 2<sup>nd</sup> person subjects.

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- (1) Children who acquire a CNSL together with French are accelerated with respect to (pronominal) subject use as compared with monolingual French-speaking children.
- (2) Children who use the CNSL as their weak language are/are not accelerated with respect to (pronominal) subject use in comparison with monolingual French children.
- (3) Children who acquire a CNSL together with French and who are accelerated with respect to (pronominal) subject use skip the stage of elsewhere forms in French.

# Data and methods

The methodological procedure applied to the current study of spontaneous child language productions can be summarized as follows: at the beginning, all utterances that generally contain a verb were identified. This includes both utterances in which subjects are realized (lexically or as a (clitic) pronoun) and utterances in which the subject is omitted. In a next step, all verbs were divided into one of three groups. Group A includes those verbs that are phonetically realized in the same way in the first, second and third person singular, as well as in the third person plural (French: je chante, tu chantes, il chante - ils chantent "sing"). Group B includes all those verb forms that do not differ phonetically in the first three persons of the singular, but do differ in the third person singular and the third person plural (French: je bois, tu bois, il *boit – ils boivent* "drink"). The verb forms that audibly mark first person in addition to number are included in group C: these are verb forms that can also occur as auxiliary or modal verbs, such as être "to be," aller "to go," avoir "to have." Finally, utterances with incomprehensible expressions and forms like il y a "there is," s'il te plaît "please," il faut "it must" were excluded from the analysis. In addition, utterances involving subject omissions and *c'est*-constructions ("it is") were considered separately. With regard to the latter, a special counting method was developed for the data presented in this article in order to be able to include *c'est*-constructions in counts of subject omissions and elsewhere forms: the children's data were examined for contrasting forms, which allowed us to determine at what point these constructions cease to be rotelearned forms.

# The children of the present study

The spontaneous speech productions of two French-Italian children,<sup>8</sup> Si\_fi and Ju\_fi, and of one French-Portuguese child,<sup>9</sup> Barbara (cf. Almeida, 2011; Almeida et al., 2012), were studied over a period of about three years, as shown in Table 1.

Ju\_fi has a MMLUwD of 0.84 in favor of French. In other words, the difference between her two languages is nearly one word. Si\_fi has a MMLUwD of only 0.35 with a slight tendency toward Italian. The difference between the two languages is less than half of a word. Barbara is the most balanced of the three children with a MMLUwD of only 0.24 in favor of EP. Si\_fi and Barbara are not growing up in France.

# The monolingual French comparison group

In order to be able to prove acceleration effect in the three analyzed bilingual children, we will statistically analyze and compare their data with six monolingual French children<sup>15</sup> regarding subject omissions. The data was MLU-matched.

<sup>&</sup>lt;sup>7</sup>All utterances that did not allow a clear reference assignment of the personal pronouns or were considered as interrupted were not included in the analysis. If repetitions occurred within the data, only those utterances were considered which did not serve the purpose of self-correction.

<sup>&</sup>lt;sup>8</sup>The corpus is part of the "Wuppertal Bilingualism Group."

<sup>&</sup>lt;sup>9</sup>The corpus used is part of the AcEP (Acquisition of European Portuguese databank).

Name of child	Number of recordings <sup>10</sup>	Country of birth	Languages	Age range	Total number of utterances containing a verb	MMLUwD <sup>11</sup>
Ju_fi	41	France	French/Italian <sup>12</sup>	1;8,16- 4:11,16	3792	0.84
Si_fi	54	Italy	French/Italian <sup>13</sup>	1;6,12-5;0,12	1287	0.35
Barbara	54	Portugal	French/ Portuguese <sup>14</sup>	1;0,8-3;10,28	3242	0.24

Table 1. Overview of analyzed data.

# The multilingual comparison group

Since our study presents results from only three bilingual children, we will statistically analyze and compare their data with six bilingual children and one trilingual child acquiring French together with German, Italian, Spanish or Russian with respect to subject omissions. The five German-French bilingual children, three of which were raised in Germany, and two in France, were investigated by Jansen (2015). The data of the French-Russian child Camille (Bailleul, 2017) – raised in France – are available from CHILDES and have been investigated by L. D'Aurizio et al. (2023). The results of the trilingual Italian-Spanish-French-speaking child were taken from Scalise et al. (2021). This child also lived in France. The data was MLU-matched.

#### Results

#### Subject omissions

Regarding subject omissions, Si\_fi realizes a total of 39 utterances with an omitted subject, which represents 3% of all obligatory contexts. After the MLU phase of 2.5–2.99, in which Si\_fi omits subjects at 9.2%, the percentage drops consistently below 5%.

(11)	suis sûr	(3;2,4)
	(I) am sure.	
(12)	va voir qu'est que c'est	(3;4,6)

(I) will see what it is. In Ju\_fi, the percentage of subject omissions is somewhat higher, at 4.7% (corresponding to 188 utterances). Ju\_fi omits subjects most in the first MLU phase with 71%, i.e. before she has reached the twoword stage. Afterwards, the values decrease continuously until as in the case of Si fi they drop to less than

word stage. Afterwards, the values decrease continuously until, as in the case of Si\_fi, they drop to less than 5% at the MLU phase of 3.0–3.49. Figure 2 illustrates the development of subject omissions in both children.

<sup>&</sup>lt;sup>10</sup>All children were audio-video recorded regularly at two-week intervals, in which they were exposed to both of their languages through separate sessions. The recordings took place at home, i.e. in a naturalistic environment, and lasted approximately 30 to 45 minutes (per language).

<sup>&</sup>lt;sup>11</sup>MLUwD (Mean Length of Utterance in words, Difference) is the difference of the MLU-values. The MMLUwD (Mean MLUw-Difference) is the averaged MLU differences over the entire study period. It is used to directly compare the two languages of a bilingual individual.

<sup>&</sup>lt;sup>12</sup>Ju\_fi's mother is a native French speaker and the father is bilingual French-Italian, but he only speaks to Ju\_fi in Italian. The family language is French.

<sup>&</sup>lt;sup>13</sup>Si\_fi's mother is from French-speaking Switzerland and thus communicates with her exclusively in French. Her father is Italian and uses only Italian in her presence. The family language is Italian.

<sup>&</sup>lt;sup>14</sup>Barbara's father is a native French speaker from Belgium and her mother is a native Portuguese speaker (cf. Almeida et al., 2012, p. 4). Although both parents speak their partner's language, they use their L1 with Barbara. The exception to this rule are Saturdays, when the family speaks only French.

<sup>&</sup>lt;sup>15</sup>The results on subject omissions in the six monolingual French children come from the following studies: Grégoire (Champaud, 1994), Theophile (Morgenstern, 2006; Morgenstern & Parisse, 2007) and Max (de Cat & Plunkett, 2002) were analyzed by Schneegans (2022). Leonard (Morgenstern, 2006; Morgenstern & Parisse, 2007), Madeleine (Morgenstern, 2006; Morgenstern & Parisse, 2007), Madeleine (Morgenstern, 2006; Morgenstern & Parisse, 2007), and Lutkewitz (2023). The data are available online from the CHILDES data collection (MacWhinney, 2000).



Figure 2. Subject omissions in Si\_fi, Ju\_fi and Barbara.

Barbara produces a total of 3242 utterances with 3.6% of subject omissions. At each MLU stage, her omission rate is below 10% (cf. Figure 2). At the MLU phase of 3.0-3.49, she uses the highest number of subject omissions (7.3%).

# **Elsewhere forms**

Si\_fi hardly uses elsewhere forms in French as illustrated in Figure (3). Of all utterances containing a subject and a finite verb, only five target-deviant forms (0.4%) are attested over the whole investigation period. Four of the five elsewhere forms produced occur in the MLU phase 3.0-3.49 and the last elsewhere form is found at 4.0-4.49. Examples (13) and (14) illustrate elsewhere forms:

(13)	"Je [1.SG] va [3.SG] crouver comm ça	(2;8,7)
	I will find out how.	
(14)	*ell' est <sub>[3.SG]</sub> là les croquettes <sub>[PL]</sub>	(2;11,3)
	they is there the croquettes	
	they are there the croquettes.	



Figure 3. Elsewhere forms in Si\_fi, Ju\_fi and Barbara.

The percentage of elsewhere forms is low in Ju\_fi's corpus as well (0.5%); she produces 19 elsewhere forms during the whole period of investigation. Most of the forms occur at 3.0-3.49. Examples from her corpus are (15) and (16).

(15)	*c'est moi [1.SG] qui est [3.SG] remontée	(3;4,2)
	It is me who is gone up	
	I'm the one who went up.	
(16)	*les animaux [PL] sort [3.SG]	(2;11,19)
	The animals comes-out	
	The animals come out.	

# Interim summary

As for subject omission, all three children reach the target-system in French earlier than has been reported for monolingual French child (MLUw 3.5–4.5). Interestingly, although Ju\_fi reaches adult French earlier than monolingual French-speaking children, her development resembles more that of monolingual children than Si\_fi's and Barbara's development.

# Comparison with other monolingual and multilingual children

We carried out a linear mixed effect model in  $R^{16}$  in which the values for subject omissions as the independent variable of Ju\_fi, Si\_fi, and Barbara were compared with the MLU values as well as the children's mono- vs. multilingualism. The monolingual and multilingual comparison groups were presented in section 5.2 and 5.3. Overall, the monolingual group contained six French-speaking children; the multilingual group included ten children. Table 2 summarizes the data from the statistical model.<sup>17</sup>

The results show a main effect for multilingualism (p < 0.001), which supports the hypothesis that multilinguals generally have lower values for subject omissions than monolingual children at comparable MLU stages. The two groups differ significantly at stage 1 (1.0–2.99) (p < 0.001), at

% of utterances with	n subject omissions ~ mu	Itilingual * MLU_range +	- (1   child)	
	% of utterances with subject omissions			
	MLU	MLU	MLU	
Child	1-2,99	3-4.99	5-6.99	Multilingual
Ju_fi	36.25	3.95		Yes
Si_fi	16.23	2.65		Yes
Barbara	3.82	4.62	1.23	Yes
Théophile	32.3	13		No
Gregoire	34.3	17.7		No
Max	38.3	14.3		No
Léonard	55.7	8.32	3.68	No
Madeleine	21	8.73	2.51	No
Philippe	16	9.52	0.68	No
Al_df	14.5	4.6	2.34	Yes
Am_df	9.78	2.32	1.28	Yes
Ce_df	18.3	4.8	0.1	Yes
Em_df	17.15	6.5	2.18	Yes
Ma_df	35.1	7.2	0.61	Yes
Di_fis	8.33	4.7		Yes
Camilla	7.23	2.54		Yes

Table 2. Data for the linear mixed effect model about monolingual and bilingual children.

<sup>16</sup>We would like to thank Dr. Andreas Opitz for supporting us with the quantitative data analysis.

stage 2 (3.0–4.99) the difference is slightly significant (p < 0.05) and at stage 3 (5.0–7.49) there are no indications of a difference (p = 0.878). In other words, multilingual children stop using (pronominal) subject omissions in French at lower MLU values as compared with monolingual children. Moreover, the model reveals a slightly significant effect for the interaction between MLU and multilingualism (p = 0.01), leading to the conclusion that the difference between both groups depends on the MLU development. In other words, we found that multilingualism is beneficial at lower MLU values, while the multilingual benefit diminishes with higher MLU values.

#### Discussion

The three children under investigation show an acceleration effect in French in comparison to monolingual French children: The difference between the monolingual and the multilingual group was significant for MLU values below 5.0 with respect to (pronominal) subject omissions.

The bilingual children investigated acquire a CNSL in addition to French, a NNSL, and they were all accelerated with respect to (pronominal) subject use. In section 4.2, we were interested in the child's "weak" language for the acceleration effect. One of the children studied, Ju\_fi, used the CNSL as her weak language (measured on the basis of MMLUwD). Although her use of (pronominal) subjects in French was accelerated as well, she resembled most the monolingual French children. The latter have been reported to omit (pronominal) subjects at peaks of 60% and 70%, an observation we made for Ju\_fi extremely early in development. Our findings reveal an acceleration effect in French whose strength seems to be related to the child's proficiency in the respective other language. Future research should show whether there is a threshold of language usage for the acceleration effect to occur at all (Müller, 2024).

The acceleration effect observed here is not limited to subject realizations, but was also observed with regard to the complete absence of a stage of elsewhere forms. Compared to the monolingual children, the bilingual children Ju\_fi, Si\_fi and Barbara inflect the verb correctly from the beginning. They are therefore not only accelerated with regard to the realization of the pronominal subject, but they also do not show an Elsewhere stage typical of monolingual French-speaking children who acquire a CNSL together with French and who are accelerated with respect to (pronominal) subject use skip the stage of elsewhere forms in French. Crucially, we would also expect that the acceleration effect in French coincides with achieving an MLUw value in Italian that supports parameter setting in every language the child acquires. According to Patuto (2015, pp. 238–239), the bilingual French-Italian children Ju\_fi and Si\_fi set the parameter for Italian at an MLUw of 2.5, which, according to the input and the experience in both languages, is reached at a different age. Consequently, when this value is reached, the parameter for French should also be set within a short period. It remains to be investigated whether this applies to all bilingual children and at what specific MLUw value in Portuguese the bilingual child Barbara sets the parameter for both languages.

The acceleration effect in French was observed in our bilingual children even though the other (not accelerated) language was "weak." In our case studies, the dominant language corresponded to the majority language. In other words, it is possible that the dominant language corresponds to the language in which a child has received more input, while the "weak" language corresponds to the language with less input. One of the most controversial topics in early child multilingualism is the amount of language exposure needed for the acquisition task (Müller, 1998; Lieven, 2010 for an overview). Our study shows that French can be accelerated regardless of whether it is the weak or the dominant language. If a child acquires a language as a weak system, s/he will need longer to achieve grammatical competence in that language in comparison to monolingual children or to multilingual children who acquire the same language as the strong one. A clear example is provided in D'Aurizio (in press) regarding the acquisition of the inflectional system in German-Italian bilingual children. Au\_di, a bilingual child with a strong preference for Italian over German, mirrors other bilingual children who prefer German in terms of the

<sup>&</sup>lt;sup>17</sup>Since some values are missing, we used a linear mixed-effect model since this statistical test is able to provide valid inferences even when some data points are absent.

acceleration effect, regardless of language balance. In the case of Ju\_fi, who develops Italian as the weak language, the child needs comparably longer to achieve the grammatical competence that indicates that the relevant parameter has been set. Needless to say that Ju\_fi needs more time and input in Italian in order to acquire the target parameter and that the acceleration effect is consequently less pronounced in French than for the other children. It is to be expected that Ju\_fi's weak command of Italian will not have as early an effect on French as it does for Si\_fi, for example.

Considering the NS parameter as illustrated in section 'Parameters as hierarchies of markedness' within the epigenetic model, children acquiring a CNSL, thus a language resulting from a meso-parametric option, set the parameter earlier in comparison to children dealing with a language system which requires target-like settings of the parameter further down the hierarchy, at the micro- or nano-parameter level (Scalise et al., 2021). Results from monolingual children are compatible with the predictions of the hierarchy. However, the bilingual children in our study have chosen the target-like setting of the parameter for French at the time they have set the parameter for their other language, a CNSL. What kind of theory can explain this fact?

Yang (2004) postulates that an adequate explanation of children's grammar(s) must abandon domain-specific learning models such as triggering in favor of probabilistic learning mechanisms. To this purpose, Yang (2004, p. 453) develops a model in which learning occurs by competition of the child's (two) grammars: the child (i) with probability Pi selects a grammar Gi (conforming to UG), (ii) analyses incoming input with Gi, and (iii) if successful, Gi will be rewarded by increasing Pi, otherwise Gi will be punished by decreasing Pi. In this way, successful parsing of the target language eliminates all non-target grammars. Learning occurs if the child is not able to parse the input with a UG-compliant grammar. In this case, it will be penalized; the more often it is penalized, the less the child will use this grammar.

Monolingual French children and the bilingual children of our study exhibit about 94% of realized (pronominal) subjects in their input. Yang's model does not explain why the monolingual French child takes so long to acquire that referential subjects must be realized. It cannot explain why the bilingual children of our study are accelerated in French: If Yang was correct, the bilingual child should try to parse the French input with a CNSL grammar, which s/he does not, since her/his development of subjects is accelerated.<sup>18</sup>

Müller (2024) develops the idea of parameter hierarchies as emerging from non-language-specific cognitive optimization strategies and linguistic (grammatical) features further in a language acquisition theory established by and for the context of multilinguals: A<sub>AIM</sub>LL (Acquisition Advantages in MultiLingual Learners). In this theory, parameter hierarchies belong to those components of language which are not duplicated (for duplicated components cf. MacSwan, 2000). In other words, they are shared by the bilinguals' two languages. Since parameter hierarchies are not duplicated, the child aims at all his/her languages. In the present case, that is in the combination of a CNSL and a NNSL, the route to the CNSL is (relatively) short. At the point when the multilingual child chooses the correct setting for Italian or Portuguese, s/he takes a decision for French as well. Since it is well known that multilingual children can separate and control their language acquired at a time when a "shorter" route-language (Italian, Portuguese) is being settled in a target-like way. In this new theory, parameters are set (nearly) simultaneously in multilingual children (Müller, 2024). In other words, French-Italian/Portuguese bilingual children need to consider both language systems at the very same time and thus they need to establish the type of language

<sup>&</sup>lt;sup>18</sup>Yang (2023) defends the Tolerance Principle (TP) against the argument that the TP is not sufficient to explain the productivity of language rules. Yang argues that the TP has never claimed that frequency is the only factor, but that it precisely describes how frequency interacts with other grammatical components. He further shows that minority rules can be productive and discusses examples such as English past tense and German pluralization. The TP enables the identification of global and local rules: If a global rule is not productive, subsets are formed to find local rules. Yang's defense does not consider that his model cannot explain the delayed acquisition of referential subjects in monolingual French children and the accelerated development in bilingual children, as it does not satisfactorily explain the mechanisms and advantages that occur in the language acquisition process of bilingual children. Further studies may be necessary to better understand the specific mechanisms of language acquisition in bilingual children and to adapt the model accordingly.

they are speaking. Since Italian/Portuguese are generally described as languages which are characterized for their fast acquisition of the NS property (Valian, 1990; Valian & Eisenberg, 1996), bilingual French-Italian /Portuguese children can use their linguistic knowledge acquired for Italian/Portuguese when they make choices for French. As a result of this linguistic experience of the bilingual child and opposed to Yang's (2004) probabilistic model, there is no need to learn statistically.

In Müller's (2024) theory, the bilingual child builds a target-like linguistic representation for NSs in CNSL. This representation provides T with phi-features in order to parse the Italian/Portuguese input. It also serves as a knowledge basis for a different and target-like representation for French as a NNSL. Due to separation and control and the earlier (target-like) representation for null-subjects in CNSL, the French input informs the multilingual child about how French is not.

Moreover, as the children demonstrate a nuanced understanding of language distinctions, it becomes evident that their cognitive processes extend beyond mere comparison. The accelerated recognition that French is not a NSL hints at a cognitive shortcut. This ability to swiftly discern linguistic differences may be attributed to various forms of markedness, as discussed by Hoekstra (1990, p. 68). To delve deeper into the cognitive mechanisms, it is essential to explore the different facets of markedness in the context of language acquisition and analysis. By doing so, we may uncover the intricate ways in which children navigate the linguistic landscape, bypassing certain comparisons to streamline their decision-making process.

If we consider the distributive characteristics, i.e. a is unmarked relative to b if a is instantiated in a larger number of languages than b, null-subject languages (i.e. other languages than French) are more common worldwide (Duguine, 2017, p. 3). In this way, French can be considered more marked in terms of distribution compared to Italian and Portuguese.

Developmental markedness considers the developmental priority of a language. It can therefore be concluded that French is the more marked language here too: Children start out with argument omissions (Hyams, 2011). Again, Italian and Portuguese are less marked than French.

We add another kind of markedness, based on Biberauer et al.'s parameter hierarchies, that of extent of relevance of a grammatical feature (similar to Hoekstra's, 1990 intensional markedness): The relevance of phi-features in Figure 1 is largest in languages like Basque, quite large in the CNSLs Italian and Portuguese, and extremely small in languages like French.<sup>19</sup>

To conclude, the bilingual children in our study benefitted from the linguistic knowledge attained earlier in the less marked language for the more marked language when they build a cognitive subroutine fed by a grammatical feature. The acceleration effect was observed in two grammatical domains: (pronominal) subject use and target-like finite verb inflection which are linked via clusters in CNSLs. Very tentatively, "accelerated clustering" is predicted if the child does not build grammar rules (Newmeyer, 2017, p. 555f.) for her/his languages in an item-by-item fashion or construction-by-construction fashion, but s/he builds cognitive subroutines with ingredients from cognition and linguistics, starting at the nowhere-everywhere level.

A short note is necessary, though: The present study is based on a small number of individuals and a small number of different language combinations. Additional studies on bilingual children with languages represented on different levels of the parameter hierarchy are necessary in order to deepen our understanding of the interaction of the child's linguistic systems.

# **Outlook for education**

What could be the future for language education? Cenoz and Gorter (2021, p. 1) introduce pedagogical translanguaging as a "theoretical and instructional approach that aims at improving language and content

<sup>&</sup>lt;sup>19</sup>Extensional markedness compares the quantities generated by a parameter for each language: a is unmarked relative to b if the set generated by P(a) is a subset of the set generated by P(b). The subset principle (Wexler & Manzini, 1987) refers to the fact that NNSLs (like French) are subsets, i.e. the included subsets, of NSLs. This is because NSLs also have realized (pronominal) subjects and the child can only acquire that the (pronominal) subject may be omitted if it initially accepts the common set. However, Roberts (2019) correctly points out that there are languages that are "in between," which leads to the question of whether the subset principle applies at all.

competences in school contexts by using resources from the learner's whole linguistic repertoire." Prior knowledge is a key concept and one of the basic questions in pedagogical translanguaging is the question of how linguistic knowledge of multilingual learners can be activated. The authors give examples of some translanguaging practices and they argue that if prior knowledge of linguistic resources is suppressed, language learning is less effective. In other words, "monolingual" educational programs are not suitable (MacSwan et al., 2017) to "compensate" for the disadvantages which come with critical periods (Meisel, 2009) and a relatively small amount of input (in foreign language learning) at school age. Accordingly, children can benefit from the knowledge in their heritage language when acquiring the additional, environmental language.<sup>20</sup>

The solution lies in considering how this specific type of learning can be facilitated in schools. To optimize the language acquisition process for children with limited input, educators should adopt tailored teaching methodologies. By recognizing the unique advantages that multilingual or bilingual children bring to the learning process, schools can tailor their educational approaches to foster these linguistic capabilities. In doing so, not only grammatical phenomena can be acquired in an accelerated manner, but students can also develop a deeper appreciation for linguistic diversity.

School can have a significant impact on language acquisition, regardless of whether a child is monolingual or multilingual. An effective language teaching methodology and a supportive environment can promote the acquisition of grammatical phenomena.

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For further details about the projects cf. Müller et al. (2023)

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# **Data Availability Statement**

The raw data are not publicly available since they contain personal information. Data Analysis of the corpora Al\_df, Am\_df, Ce\_df, Em\_df, Ma\_df has been done by Veronika Jansen (2015). Data Analysis of the corpus Di\_fis has been done by Elena Scalise; cf. Scalise et al. (2021). Data Analysis of the corpora Ju\_fi, Si\_fi has been done by Dinah Hoffmann (2022).

<sup>&</sup>lt;sup>20</sup>In our opinion, pedagogical translanguaging involves recognizing and affirming the cognitive and social relevance of multilingualism (MacSwan, 2017, 2022).

Data Analysis of the corpus Barbara (CHILDES) has been done by Isabel Silva Colaço (2022). Data Analysis of the corpus Camille (CHILDES) has been done by Laura D'Aurizio, cf. L. D'Aurizio et al. (2023).

#### **Data protection**

The names of all children analyzed for the present study have been anonymized.

Parents and children who are of legal age have been informed in their native language about data usage beyond the life of the project in which they were collected (informed consent)

Objectives and Methods obey DSGVO Basic Regulation of Data protection (27<sup>th</sup> of April 2016). Objectives and likely impact are communicated to parents and their children who have reached legal age.

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