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# Testing children's knowledge of generic null pronouns[1]

## *Testando o conhecimento de crianças sobre pronomes genéricos nulo*

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## ABSTRACT

In this paper, I discuss an experiment conducted with children acquiring Brazilian Portuguese (BP) as their native language. The experiment was designed to test if Brazilian children understand that the null subject in impersonal structures has the generic reading in BP instead of the referential one. The experiment consisted of a Truth-Value Judgement Task (TVJT). The results show that children as young as 4 years of age understand the null subject in impersonals as generic. Based on a study showing that a 2-year-old child acquiring Estonian already produces null impersonals (TORN-LEESIK; VIJA, 2012), it is possible that children acquiring BP correctly assign the generic reading to a null pronoun in impersonal constructions before the age of 4. I propose that this knowledge could be tested in children younger than 4 using the Intermodal Preferential-Looking (IPL) paradigm (GOLINKOFF *et al*.,1987; NAIGLES; TOVAR, 2012), a method more suitable than the TVJT to test children that are very young.

**Keywords:** generic null pronoun, impersonal structures, language acquisition

## RESUMO

Neste artigo, discuto um experimento conduzido com crianças adquirindo o português brasileiro (PB) como língua materna. O objetivo do experimento era testar se crianças brasileiras entendem que o sujeito nulo em estruturas impessoais tem uma leitura genérica no PB, em vez de referencial. O experimento consistiu em uma Tarefa de Julgamento de Valor de Verdade (TJVV). Os resultados mostram que crianças com 4 anos de idade já interpretam o pronome nulo em impessoais como genérico. Baseado em um estudo que mostra que uma criança de dois anos adquirindo o estoniano já produz sujeitos nulos impessoais, é possível supor que crianças adquirindo o PB atribuam corretamente a leitura genérica ao pronome nulo de impessoais antes dos 4 anos. Proponho que esse conhecimento possa ser testado em crianças antes dessa idade usando o Paradigma do Olhar Preferencial, um método mais adequado do que a TJVV para testar crianças muito novas.

**Palavras-chave:** pronome nulo genérico, estruturas impessoais, aquisição da linguagem

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## Introduction

In this paper, I report an experiment using the Truth-Value Judgement Task (TVJT) designed to test if children acquiring Brazilian Portuguese (BP) between the ages of 4 and 7 understand that the null subject in impersonal structures has the generic reading. After discussing the experiment, I outline the design of another experiment, which could be used to test children younger than 4 on the same property discussed here. The experiment I propose uses the Intermodal Preferential-Looking (IPL) paradigm as a method.

There are several types of pro-drop languages. *Radical pro-drop languages,* such as Chinese, Korean and Thai, are characterized by lacking subject-verb agreement. They allow dropping of any argument in the structure, subject or object, in fairly unrestricted circumstances. BP is considered to be a *partial null-subject language*: the null subject is possible under specific and restricted conditions. Partial null-subject languages fall between *consistent null-subject languages*, such as Italian, Spanish, European Portuguese (EP), which allow referential null subjects in any context, and languages that do not allow null-subjects, such as English, German and French. According to Holmberg et al. (2009), for BP, Finnish and Marathi (all partial null-subject languages) the conditions that allow for non-expletive null subjects include:

(1) a. when the subject is a generic pronoun corresponding to English 'one' (or 'you');
b. when the subject is controlled by an argument in a higher clause.

In the experiment to be reported, I tested children's knowledge of (1a), using impersonal structures such as (2a).

(2) a. Nessa escola *e* não pode escovar os dentes depois de comer.
In.this school *e* not can brush:INF the teeth after of eat:INF
'In this school one cannot brush one's teeth after eating.'

Whereas in consistent null-subject languages only the referential reading of the third person pronoun (he/she) is possible in (2a), in partial null-subject languages such as BP, the sentence in (2a) can only be understood as generic: in the place specified by the fronted adverb 'in this school', *one* cannot brush one's teeth after eating. In European Portuguese, a consistent null-subject language, sentence (2a) only allows for the referential reading of the null subject. In order to express the generic reading of the null subject, EP uses a *se* pronoun:

(2) b. Nessa escola não *se* pode escovar os dentes depois de comer.
In.this school not SE can brush:INF the teeth after of eat:INF
'In this school one cannot brush one's teeth after eating.'

I designed the experiment described below in order to see if Brazilian children know the reading of the null pronoun in a sentence like (2a) is generic. The prediction was *if children knew that BP is not a consistent null-subject language, they should reject the referential reading of the null pronoun in a sentence like (2a)*. As will be discussed in more detail in section 5, the experiment does not have the intention to answer whether Brazilian children know they are acquiring a partial null-subject language. It only intends to show if they know that the null subject in sentences like (2a) is generic: this is so because radical pro-drop languages behave in the same way as partial null-subject languages in allowing only the generic reading of the null pronoun in a sentence like (2a).

## 1. Methodology and Materials

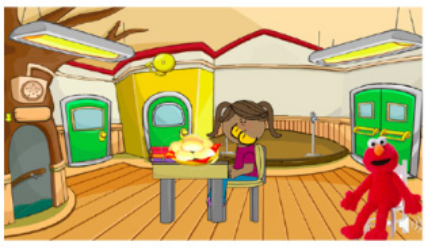
The experiment employed a Truth-Value Judgement Task (TVJT) methodology (CRAIN; MCKEE, 1985). In this task, the child has to provide a binary judgment: whether the statement made by the puppet is true or false. In our case, children heard a sequence of narratives in BP about a school and judged, at the end of each story, if the character Elmo said something that happened in the story (true) or not (false). PowerPoint animations were used and the task took about 15 minutes to be completed. As mentioned before, the objective of this experiment was to see if children acquiring BP understand that the null subject in an impersonal structure has to be generic instead of referential. If they understand that BP is *not* a consistent null-subject language like EP, the null subject would be judged invariantly as generic. See below an example of one of the stories (Figure 1):

**Figure 1**: TVJT experiment

***Slide 1*** Como você já percebeu, essa escola é muito estranha. Uma das regras é que só um dos alunos, o Joaquim, tem que comer sobremesa na hora do lanche ao invés de comida normal.
'As you already noticed, this school is very weird. One of the rules is that just one of the students, Joaquim, has to eat dessert during lunch instead of regular food.'

***Slide 2*** Olha o Bruno. Ele trouxe uma salada pra comer no lanche. Olha, ele está comendo a salada agora.
'Look at Bruno. He brought a salad to eat for lunch. Look, he is eating the salad now.'

***Slide 3*** Mariana trouxe pão de queijo pra comer no almoço. Olha, ela está comendo pão de queijo.
'Mariana brought cheese balls to eat for lunch. Look, she is eating cheese balls.'



***Slide 4*** Olha o Lucas! Ele está comendo macarrão.
'Look at Lucas! He is eating pasta.'

***Slide 5*** Primeiro, o Joaquim colocou um sanduíche na lancheira dele, mas aí ele lembrou da regra de que ele tinha de trazer sobremesa para o almoço. Então ele trouxe um brigadeiro. Olha, ele está comendo um brigadeiro.
'At first, Joaquim put a sandwich in his lunchbox, but then he remembered the rule that he had to bring dessert for lunch, so he brought a brigadeiro instead. Look, he is eating a brigadeiro.'

***Slide 6*** Agora o Elmo vai dizer uma parte da história. Vamos ver se ele prestou atenção ou não.
'Now Elmo is going to tell us a part of the story. Let's see if he paid attention of not.'

***Slide 7*** Nessa escola *e* tem que PRO comer doce na hora do almoco.
In.this school has that eat:INF dessert at time of.the lunch
'In this school one has to eat dessert for lunch.'

**Source**: images assembled by the author[3]

In the story, Joaquim is the possible referential subject. Notice that if the child understands the null subject as referential, (s)he would say that the sentence is *true*, because Joaquim, in fact, had to eat dessert for lunch. If the child understands the null subject as generic, (s)he should say that the test sentence presented in *Slide 7* is *false.* The generic reading of the null subject indicates that it is a property of those that are subject to the rules of the school that they should eat dessert for lunch[4]. However, in the story, this rule was applied to a single character, Joaquim.

The experiment was composed of six test sentences (Table 1), two training items and two fillers, presented randomly between the test sentences. Test sentences were given in two different conditions,

3 Original sources: Jim Henson's Elmo puppet available at https://www.nbcnews.com/dateline/video/elmo-joins-today-for-tell-a-joke-day-and-matt-lauer-breaks-him-up-1025796675794;https://www.amazon.com /Gund-028399758968-25-Elmo/dp/B000EA6YQU; children, food and objects available at https://www.mycutegraphics.com/graphics/graphics.html; waitress, available at https://filacoahuila.com/10725-waiter-waitress-royalty-free-clip-art-customer-demand-cliparts-aaabee/; background, available at https://www.deviantart.com/gamerrainbowshy (accessed on June 2018)

4 If we observe the story that pairs with the test sentence in *Slide 7*, the reading in which the reference of the null subject could be constructed as the specific students from the school (*i.e.* Bruno, Mariana and Lucas) would be pragmatically felicitous. This reading of the null subject is the so-called existential reading and it would be best translated as *they* instead of *one*. However, semantically, the test sentences used in the experiment can be classified as characterizing sentences which have a generic reading, not an existential one. One of the properties of characterizing sentences is that they express a *rule* or a general fact (KRIFKA *et al.* 1995). To illustrate how the test sentences used in the experiment are characterizing sentences, consider, for example, the test sentence presented in *Slide 7.* The sentence expresses a *rule* that holds in the school (students have to eat dessert for lunch). It states that it is a property of those that are subject to the rules of the school that they have to eat dessert for lunch (this happens to be false, given the fact that only Joaquim should eat dessert for lunch).

as shown in Table 1. The different conditions were the type of modal presented in the sentence (*tem que* 'have to' and *não pode* 'cannot'). For half of the test sentences, the expected answer was *true* because the generic reading was *true* in the context; for the other half, the expected answer was *false* because only the referential reading was possible (and this reading is ungrammatical in BP).[5] All the test sentences were null impersonals with a fronted adverb and a deontic modal, as we can see in Table 1. This structure was used because a survey conducted in Bertolino (2017) showed null impersonals following this pattern were highly accepted by native speakers of BP, but the same did not happen with analogous structures without the fronted adverb and/or the deontic modal[6].

**Table 1:** Test sentences

| CONDITION | TEST SENTENCES | EXPECTED ANSWER |
|---|---|---|
| Tem que ('have to') | Nessa escola *e* tem que PRO trazer animal de estimação.<br>In.this school *e* has that bring:INF pets<br>'In this school one has to bring pets.' | T(rue) |
| Tem que | Nessa escola *e* tem que PRO comer doce na hora do almoço.<br>In.this school *e* has that eat:INF dessert in.the time of.the lunch<br>'In this school one has to eat dessert for lunch.' | F(alse) |
| Tem que | Nessa escola *e* tem que PRO brincar dentro da sala de aula.<br>In.this school *e* has that play:INF inside of.the room of class<br>'In this school one has to play in the classroom.' | F |
| Não pode ('cannot') | Nessa escola *e* não pode PRO estudar de manhã.<br>In.this school *e* not can study of morning<br>'In this school one cannot study in the morning.' | F |
| Não pode | Nessa escola *e* não pode PRO escovar os dentes depois de comer.<br>In.this school *e* not can brush:INF the:PL teeth after of eat<br>'In this school one cannot brush one's teeth after eating.' | T |
| Não pode | Nessa escola *e* não pode PRO entregar a lição de casa.<br>In.this school *e* not can turn.in:INF the lesson of home<br>'In this school one cannot turn in the homework.' | T |

**Source:** author

**Table 2:** Training Items and Fillers

5 An anonymous reviewer pointed out that the two conditions combined with the expected answer, which also could be considered a condition, lead to a 2x2 design with four conditions. According to the reviewer, the experiment should have minimally twelve experimental sentences. The experiment reported here only had a total of ten sentences (six test sentences, two training items and two filler items). The number of the sentences used in the experiment were limited by children's attention span. When the pilot was conducted, it was noticed that few children could focus for more than 15 minutes. In the future, though, the experiment could be conducted with more sentences and the same child could be tested on different days.

6 The explanation for why null impersonals with a fronted adverb and a deontic modal are more acceptable than their counterparts lacking these elements goes beyond the scope of this paper. But it can be said that the fronted adverb is satisfying the requirement to have [Spec, TP] filled (CHOMSKY, 1981, 1982). The null impersonal pronoun is unable to satisfy this requirement, if we adopt the approach that it is a φP pronoun which stays in [Spec, *v*P] (HOLMBERG, 2005). The deontic modal, on the other hand, functions as an overt marker of genericity in the sense that its presence helps us establish that the statement that follows it has a deontic modal base: it describes a world in which a rule holds (see DAHL, 1975; HEIM, 1982 and PAPAFRAGOU, 1996 on the link between genericity and modality).

| **TRAINING ITEMS** | **EXPECTED ANSWER** |
|---|---|
| O Joaquim não disse a palavra dinossauro.<br>The Joaquim not say:PAST the word dinosaur<br>'Joaquim did not say the word dinosaur.' | T(rue) |
| O Joaquim coloriu o carrinho de amarelo.<br>The Joaquim paint:PAST the little.car of yellow<br>'Joaquim painted the car yellow.' | F(alse) |
| **FILLERS** | **EXPECTED ANSWER** |
| O Joaquim levou uma banana nanica pra escola.<br>The Joaquim take:PAST a banana dwarf to school<br>'Joaquim brought a dwarf banana to school.' | F |
| O Joaquim foi de Homem Aranha pra escola.<br>The Joquim go:PAST of man spider to school<br>'Joaquim went to school wearing a Spiderman costume.' | T |

**Source:** author

Notice that the two deontic modals used in the test sentences were *tem que* ('have to') and *não pode* ('cannot'). Some valid criticism could be made regarding this choice. First of all, the modal with the negation (*não pode*) should have been avoided since the negation might introduce processing difficulties for the child. Also, it could be argued that as *não pode* is preceded by a negator and *tem que* does not have it, one cannot say that the test sentences are testing equally the same thing (*i.e.* the test sentences do not have two modals, but a modal (*tem que*) and a modal preceded by negation (*não pode*)).

There is a reason why the negation was added to the modal *poder,* though. The modal *tem que* very clearly denotes obligation and imposition (COMPARINI, 2008), while *poder* by itself is very often associated with the epistemic reading, but when preceded by negation, *poder* can be used as a "strong restrictor", a modal that imposes a prohibition (or a rule) and it is, therefore, clearly deontic. Another modal that has a deontic reading is *dever* (must). Nevertheless, this modal can have an epistemic reading in some contexts (see (3) below, in which the modal expresses "possibility"):

(3) ... e nessa hora... é que eu percebi que o que tinha... era uma coisa assim de de de::… uma mistura de sentimento que **devia** ter uma ligação com ciúme... porque eu nunca fui ciumenta... (COMPARINI (2008: 41))

… and at this moment… it was when I noticed what was happening… it was something like… a mix of feelings that **must** have an association with jealousy… because I was never jealous…

In sum, I chose to use *poder* with the negator because (i) it would be problematic to use *poder* by itself, without the negation, since the modal would probably be interpreted as epistemic by the participants; (ii) the other modal that could be used as deontic, namely *dever*, is ambiguous between the epistemic and the deontic reading.[7]

## 3. Participants

I interviewed forty-two monolingual children acquiring BP as their native language. They ranged in age from 4;0 to 7;10 (mean age = 5;8). The children were recruited in a variety of places: "Museu da Imaginação" (museum), children's bookstores, activity centers ("Grapali Brinquedoteca", "Terra do Nunca Brinquedoteca" and "Play Space")[8]. All children were attending pre-school or elementary school. For analysis purposes, children were divided into four groups by age (each group had 10 children): 4;0 to 4;11 years of age, 5;0 to 5;11 years of age, 6;0 to 6;11 years of age and 7;0 to 7;11 years of age. Fifteen adults were tested as well.[9]

## 4. Results

The total number of children interviewed, including the ones that had to be excluded from the analysis, is forty-two. The number of children included in the analysis was forty. One child was excluded because he was too old (8-year-old). Another one (4-year-old) was excluded because he did not want to answer the questions. Children who answered the training items wrongly were corrected until they demonstrated they understood the experiment. Filler items were answered as expected by the children who were included. The results for each age group are presented in the graphs below. Each graph provides the percentage of responses that matched the expected answers for each test-item (in the order they were presented in Table 1, above):

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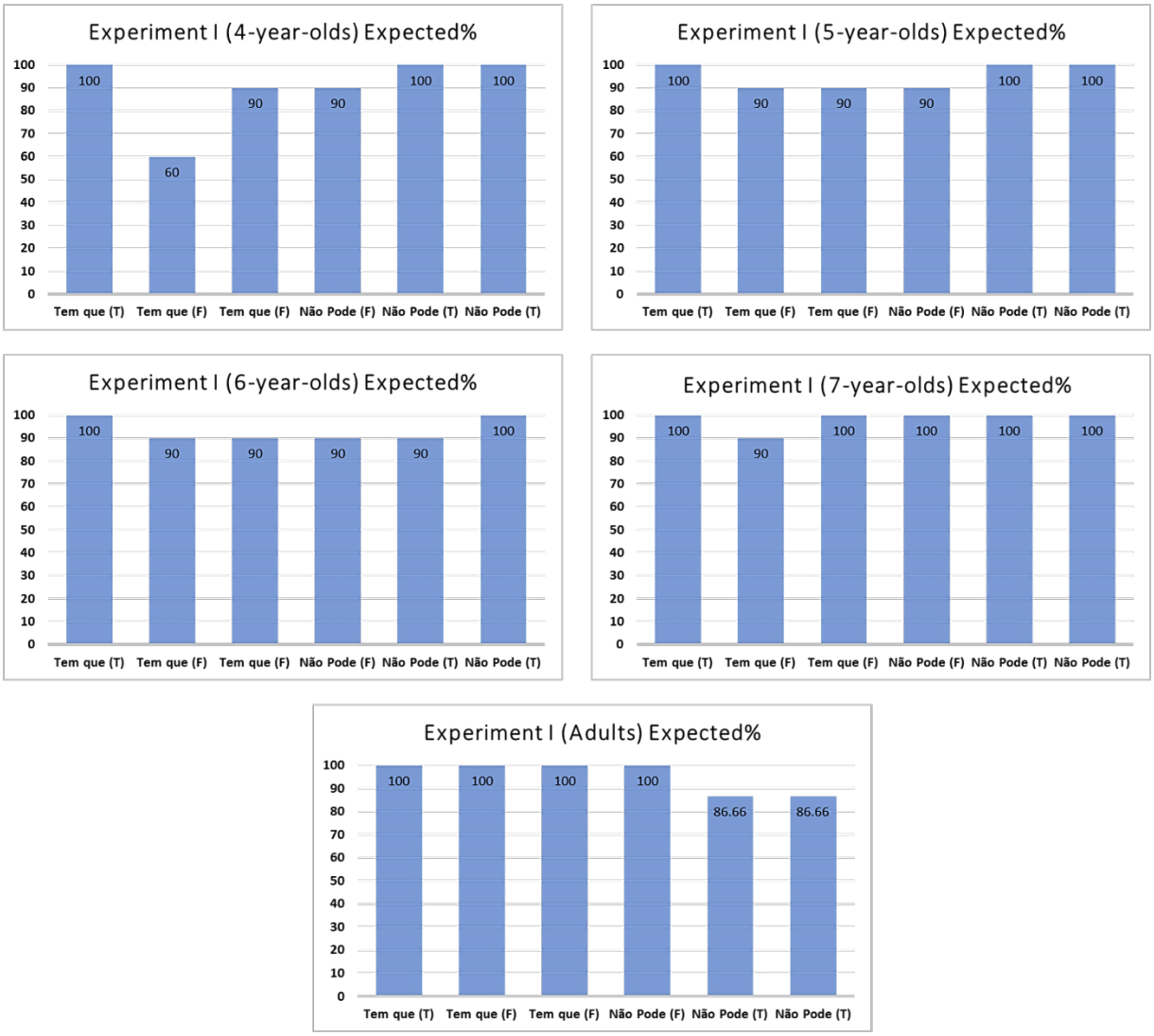
7 Lunguinho (2014) studied the spontaneous speech of two children between 1;02 and 4;11 years of age. He found that the modal *dever* in the children's grammar only expresses epistemic modality. This is another reason why it would have been problematic to use *dever* in the test sentences as a deontic modal.

8 All children were recruited in the city of São Paulo, Southeast Region of Brazil.

9 Socioeconomic status was not a variable taken into account in this study. That is, no information about the socioeconomic background of children was collected. As the presence of generic null subjects in BP is taken to be the result of a parametric option (precisely, a negative setting of the D in T and φ-dependent parameters, as Holmberg (2010) proposes), the prediction is that this grammatical property is not subject to sociolinguistic variation. This prediction needs to be investigated in the future, though.

**Graph 1:** Percentage of expected answers by each age group (N = 10, for each child group bar chart; N = 15, for the adult bar chart)



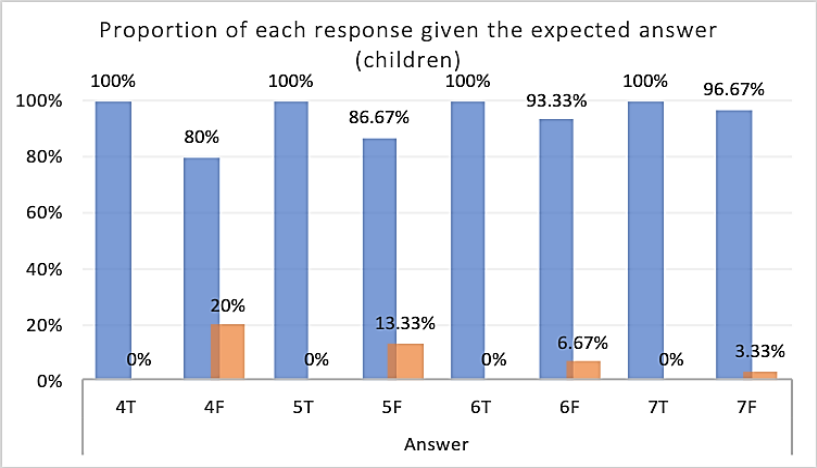

**Source:** author

As the graphs suggest, children behaved adult-like (supplying more than 85% of expected answers for each item), with the exception of 4-year-olds on the second item with *tem que*. Notice, though, that this happened only for one item, and that the group performance was adult-like otherwise. It could be argued that the reason the rate of expected answers was only 60% for this particular test sentence was because it was the first 'false' test sentence which was presented to the children. They had to exclude, for the first time in the test, the referential reading of the null subject. For 4-year-olds, false test sentences could be the hardest items in the whole experiment and these sentences could have caused them some confusion in their first judgement[10]. In fact, the statistical analysis shows an

10 As an anonymous reviewer observed, the high proportion of incorrect answers for the first false item of the experiment could be avoided by (a) randomizing the test items or (b) having multiple test lists, in which the items would be presented in a different order across participants.

effect of the answer (whether it was true or false); children were more likely to give the wrong answer when the expected answer was false (Wilcoxon test: $Z = 2.78$, $p < 0.01$), as can be visualized in the following bar chart (Graph 2). The y-axis quantifies the proportion of true and false answers that were given by the children. The x-axis contains the ages (4-, 5-, 6- and 7-year-olds) and an indication of the expected answer (F(alse) or T(rue)). As we can see, mistakes were *only* made when the expected answer was F (mistakes are indicated by orange, while correct responses are indicated by blue) for all age groups.

**Graph 2:** Bar chart showing an effect of the answer type (children)




**Source:** author

A non-parametric Friedman test of differences among repeated measures was conducted to see if there is a difference between the children's age groups and between conditions. Children were not compared to adults, since the level of accuracy of 7- and 6-year-olds was already adult-like, with a percentage of unexpected answers of only 3% for the second group and 1.6% for the first group. The results of the Kruskal-Wallis show there is no significant difference between any age group (Chi-square = 0.734, p = 0.8651). In other words, in general, all the groups of children provided expected answers and there is no significant difference between them. No difference between the conditions *tem que* and *não pode* was found either (Friedman Test: Chi-square = 3.00, p = 0.083).

## 5. Discussion

Readers might be concerned children performed well in the experiment not because they have the knowledge that in BP the null subject of impersonals should be generic, but because the referential subject was not salient enough. In our stories the character "Joaquim" was always the possible referential subject. If it was the case this character was not salient enough in the stories, children would have no choice but to choose the generic reading: the one that would always be the

expected answer. Therefore, a failure in the methodology would explain why children performed well in the experiment.

Nevertheless, it doesn't seem to be the case that "Joaquim", the possible referential subject, was not salient enough in the stories. In all the stories, Joaquim was the last character to appear and be mentioned before the slide in which Elmo is about to say the test sentence. That was the case even for the fillers and training items (in these items, Joaquim was mentioned in the sentence itself, as we can see in Table 2). Besides that, Joaquim was salient because he was either the only character that would be the exception to a general rule, or the only character to which a rule would apply. Going back to Table 1, for the impersonal sentence translated into English as, "In this school one has to bring pets", Joaquim is the only one in the school that does not bring a pet. For the sentence, "In this school one has to eat dessert for lunch", Joaquim is the only student that has to eat dessert for lunch, while all the other students eat regular food. In the story, for the sentence, "In this school one has to play in the classroom", while all students play outside, Joaquim is required to play in the classroom. For "In this school one cannot study in the morning" all students are required to study in the morning, while Joaquim has to take a nap during the daytime. In the story, for the sentence, "In this school one cannot brush one's teeth after eating", the students receive a weird recommendation from a dentist that they shouldn't brush their teeth after eating, but Joaquim, who has big teeth, is the only student that has to brush his teeth after eating[11]. Finally, in "In this school one cannot turn in homework", while all the children are not required to turn in their homework assignments, Joaquim is the only one who is required to do that. In sum, Joaquim is salient enough in the context: not only does he appear and is mentioned in all the slides that precede the test sentence, but he is also the most noticeable character in the stories due to his deviance to the general rules or to the fact that the rules only apply to him, sometimes.[12]

Not being aware of any other confounding factor that could explain why children performed well in this experiment, it can be concluded that children as young as 4 years old reject the referential reading of null subjects in impersonal sentences in BP, suggesting that they already know that they

11 The rules presented in the stories from the experiment were explained to the child to be absurd and inappropriate if applied to the real world before I started each test. The effect was that the stories would sound amusing to the children and they did not seem bored while watching them. Sometimes children would request me to play the stories over again to them.

12 An anonymous reviewer observed Joaquim is no longer the most salient discursive topic when the test sentences are uttered by Elmo, as they are preceded by the referential expression *uma parte da história* 'a part of the story' (*agora o Elmo vai dizer uma parte da história…* 'now Elmo is going to tell us a part of the story'). This topic shift could make it difficult for participants to recover Joaquim as a possible referent for the null pronoun. It is a question, though, whether this topic shift really happens, since differently than 'Joaquim', 'a part of the story' is [- animate] and cannot serve as a referent for the null subject in the test sentences which always describe rules applied to human beings.

are *not* acquiring a consistent null-subject language.

Now I turn to the discussion of whether or not we can conclude that 4-year-olds already know that they are acquiring a partial null-subject language. This conclusion cannot be extracted from this experiment, since radical pro-drop languages (languages without overt verbal agreement) allow only the generic reading of the null subject in sentences equivalent to the ones in the experiment reported here. In the following sentence in Chinese (4), a radical pro-drop language, the subject is null and it can only have the generic reading, the referential reading being impossible[13] (see also HOLMBERG; PHIMSAWAT, 2005, for Thai):

(4) Zai zhe-ge xuexiao, *e* chi fan yihou *e* bu neng shua ya.
At this-CL school, *e* eat meal after *e* not can brush teeth
'In this school one cannot brush one's teeth after eating.'

It can be drawn from the experiment that children as young as 4 years old already know that the null subject in a structure like (2a), repeated here in (5), has the generic reading. Therefore, Brazilian children *know they are not acquiring a consistent null-subject language,* since in consistent null-subject languages such as EP, the null subject in (5) necessarily has the referential reading.

(5) Nessa escola *e* não pode escovar os dentes depois de comer.
In.this school *e* not can brush:INF the teeth after of eat:INF
'In this school one cannot brush one's teeth after eating.'

## 6 Future research

### 6.1 Early knowledge of null impersonals: the case of Estonian

In this section I propose a new experiment to test the same knowledge in younger children. Before discussing the new experiment, I would like to explain why it is worthwhile to test the knowledge that children younger than 4 have regarding null impersonals. The motivation for this new experiment is the study by Torn-Leesik and Vija (2012). The authors show that a child acquiring Estonian (a partial-null subject language like BP) uses null impersonals with the generic reading quite early, at the age of 2. This fact opens the possibility that children acquiring BP also demonstrate knowledge of impersonal pronouns before the age of 4.[14]

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13 I am indebted to Shengyun Gu and Margaret Chui Yi Lee for the Chinese data.

14 A longitudinal study on null impersonal constructions in BP also needs to be conducted in the future. To my knowledge, there is no study specifically addressing the acquisition of null impersonal construction in BP, although there are longitudinal studies conducted on the acquisition of null subjects in BP in general (SIMÕES 1999; MAGALHÃES, 2006).

Torn-Leesik and Vija (2012) present a longitudinal study on the acquisition of Estonian impersonals in the speech of one child: Andreas, age 1;7 to 3;1 (CHILDES database)[15]. Estonian is reported to be a partial null-subject language, at least in its spoken form (HOLMBERG, 2016: 366). Estonian impersonals can be formed either with transitive or intransitive verbs, with unaccusatives and modals (TORN, 2002; TORN-LEESIK, 2007, 2009). Notice in the examples below in (6) that Estonian impersonal sentences have no overt subject, which makes this study interesting for our purposes, since the impersonal structures that we are studying in BP also have a null subject.

In Estonian, impersonal structures are marked in the following way: in the present tense, the suffix *-(d/t)akse* on the verb (6a) indicates that the voice in the construction is impersonal. In the past tense, the suffix *-d/ti* marks impersonality on the verb (6b). In the present perfect, the impersonal is formed by the third person present form of the auxiliary *olema* ('to be') and the *-tud* participle marker on the main verb (6c). The past perfect is formed in a similar way to the present perfect, the only difference being that the auxiliary *olema* is in the third person past form (6d)[16]:

(6) a. Loetakse raamatuid.
read:IMP:PRES books:PART
'One reads books.'

b. Loeti raamatuid.
read:IMP:PAST books:PART
'One read books.'

c. On loetud raamatuid.
be:PRES:3 read:PASS:PTC books:PART
'One has read books.'

d. Oli loetud raamatuid.
be:PAST:3 read:PASS:PTC books:PART
'One had read books.'

(TORN-LEESIK; VIJA, 2012: 252)

15 CHILDES (Child Language Data Exchange System) http://childes.psy.cmu.edu/

16 The following is a list of abbreviations which appear in (6) and (7): IMP impersonal, ILL illative, PART partitive, PASS passive, PRES present, PTC particle, 3 third person.

The use of null impersonals in Estonian with the generic interpretation was found very early in the speech of Andreas. Consistent adult-like use of the construction starts at the age of 2;3 and it progresses until the last age analyzed (3;1), although Andreas sometimes has slight problems in using the correct verb stem, as we can see from the example below:

(7) siis nätsutakse [*] [= nätsutatakse] ja siis pannakse prügikasti.
then chew:IMP:PRES and then put:IMP:PRES bin:ILL
'then one chews it and then puts it in the bin.' (Andreas, 2;8)
(TORN-LEESIK; VIJA, 2012, p.262)

It might be the case that null impersonals were acquired early by Andreas due to particularities in the language: according to Viitso (1998), null impersonals are considered to be basic constructions in Estonian. It does not seem, though, that the same is true for BP. According to the adult data reported by Assis (2017), the generic null pronoun is being replaced by the generic pronoun *você*, which suggests that null impersonals are not a "basic construction" in BP and therefore they may not be as salient in the input as null impersonals in Estonian are.

Testing null impersonals in 3- and 2-year-olds acquiring BP is important because it would show whether (i) the early acquisition of null impersonals in Estonian is a language-particular phenomenon or (ii) it is a more general pattern that can be seen across different languages allowing generic null pronouns. Also, since the study in Estonian had only one participant, it would be important to test the acquisition of impersonals with a group of children.

### 6.2 An IPL experiment

The TVJT is not an appropriate method to test children younger than 3;0 (BLUME; LUST, 2017). Even when this age restriction is adopted by studies, younger children exhibit more acceptance of false scenarios and 'yes bias' (EISELE; LUST, 1996). As argued by Blume and Lust (2017: 148), the TVJT requires complex cognitive computation by participants. The child participating in a TVJT experiment must perform the following cognitive tasks: (i) (s)he must listen to a story and interpret it; (ii) (s)he must hear the test sentence and relate it to a relevant part of the story just told; (iii) (s)he must judge whether the test sentence is true or false. Relating the test sentence to a relevant part of the story (*i.e.* step (ii)) can be challenging to young children: we can imagine the scenario in which the child says that the test sentence is *false* even when it is *true*, because it does not match a certain part of the story the child perceived as relevant.[17] Also, when asking the child to judge whether the test

17 Take as an example the test sentence "In this school one has to bring pets". The sentence was true, because the

sentence is true or not we need to rely on the child's sense of "truth" (*i.e.* the correspondence between a situation and what is said).

There is another type of TVJT in which no story is told to the child: pictures are presented, and the child has to judge whether a sentence is true or not given the pictures. This version of the TVJT is simpler than the dynamic version of the task with a story, in the sense that the child does not need to listen to a story and interpret it. Children still must relate the test sentence to a relevant part of the picture depending on the complexity of the image (*i.e.* step (ii)). In this version of the TVJT, we still have to rely on the child's sense of "truth" (*i.e.* step (iii)).

As I intend to test 3- and 2-year-olds, there is the need to use a method more suitable to young children. The Intermodal Preferential Looking (IPL) paradigm[18] is a method that does not demand any verbal response, acting-out or pointing by children, which makes it suitable to assess language comprehension of very young children (as young as 9 months) (NAIGLES; TOVAR, 2012). Besides having the advantage that the child is not asked to give any explicit response to the experimenter, the IPL paradigm does not require the child to perform any of the complex cognitive tasks just described. First of all, as we will see below (Figure 2), the child does not have to listen to a story and interpret it (*i.e.* step (i)) during an IPL experiment. The IPL paradigm also does not run into the same issues of relevance of information as the TVJT (*i.e.* step (ii)), as the child does not have to choose a part of a story or image to judge whether it is true or not. Most importantly, the IPL does not rely on the child's notion of "truth" and in her/his judgement (*i.e.* step (iii)): the child does not have to judge whether a sentence is true or false, (s)he just has to look at the clip that matches the test sentence. For these reasons, the IPL paradigm is arguably a simpler task than the TVJT and thus more appropriate to test children who are below the age of four.

The first version of the IPL paradigm was created by Golinkoff *et al*. (1987) and the version of the IPL I present here is based on Naigles and Tovar (2012). In the IPL paradigm, children watch side-by-side video clips while a camera records their eye-movements. The clips appear in series starting with a non-directing audio (for control purposes), and then with a test audio that should match only one of the videos. A screen with a blinking red light appears between stimuli to hold children's attention. If the child wants to sit on the parent's lap, the parent cannot have auditory or visual access to the stimuli. In order to not influence the child's choice, the parent listens to music on a mp3 player while watching the video.

After the data is collected, children's eye movements are coded offline by coders who are blind to the conditions. The basic prediction is that children who have the linguistic knowledge about the

students in the school had to bring pets after the first day of school. However, a child who stays fixated on the events that occurred on the f*irst day of school* might say that the sentence is false instead of true, because no one had to bring pets on the first day of class.

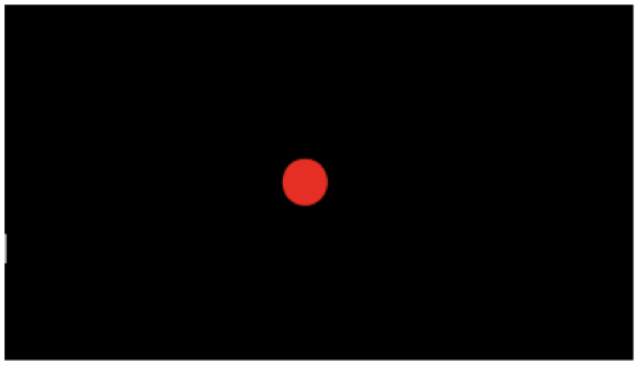
18 As an anonymous reviewer pointed out, the IPL is a method that has been used in Brazil by two research groups: LAPAL (PUC-Rio) and NEALP (UFJF).

construction being tested will look more quickly and longer at the video that matches the test audio.

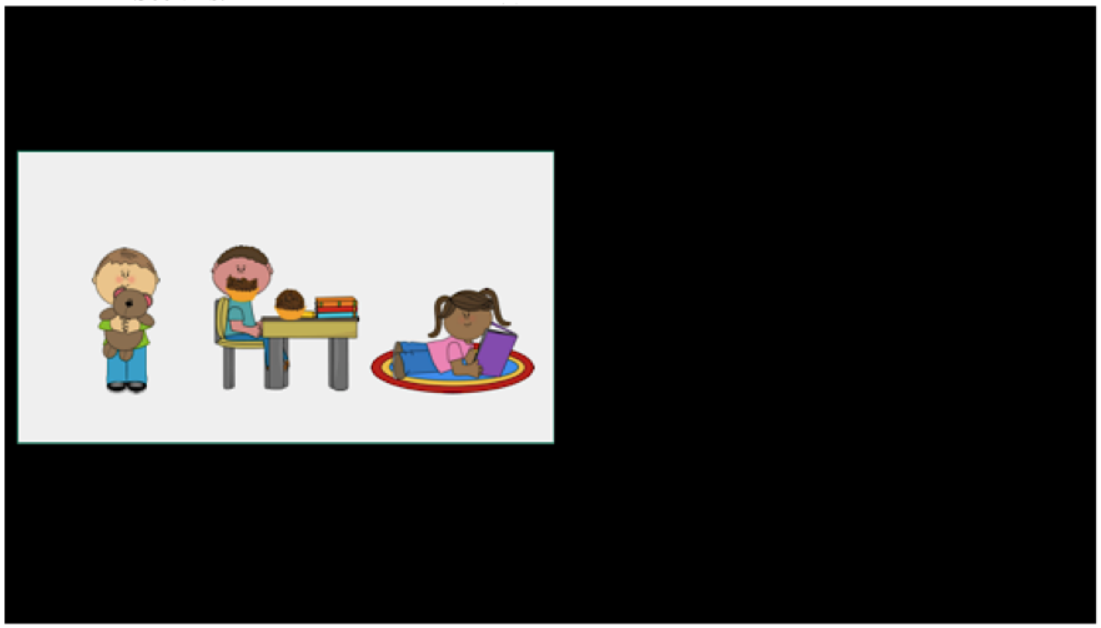
The objective of this experiment is the same as in the one previously reported: to see if children acquiring BP understand that the null subject in an impersonal structure has to be generic instead of referential, with the difference that with the IPL experiment we will be able to test much younger children. If children understand BP is *not* a consistent null-subject language, they should look more quickly and longer at the clip compatible with the generic reading of the pronoun (showing a collective of people performing the action described in the impersonal sentence) than at the clip compatible with the referential reading of the pronoun (showing a single individual performing the action described in the impersonal sentence). Ideally, we should use test sentences very similar to the ones used in the TVJT, in order to obtain comparable results in both tasks. Figure 2 shows an example on how the IPL experiment would work:

**Figure 2**: IPL Experiment

***Screen 1:*** Ó, olha!
'Oh look!'

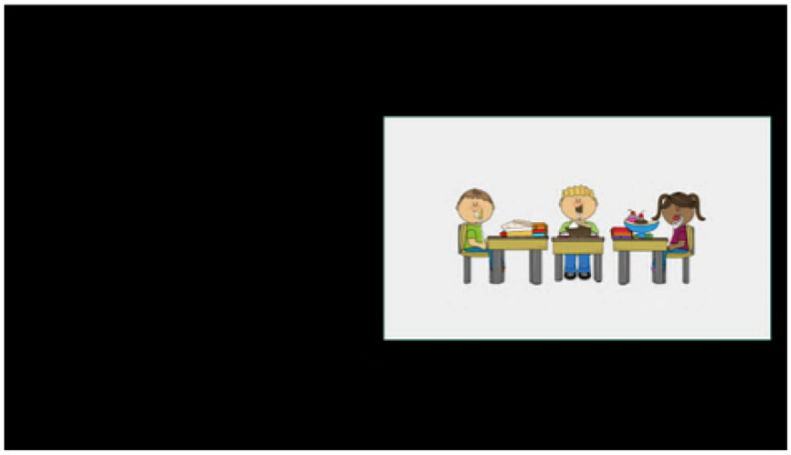


***Screen 2:*** Veja isso.
'See this.'



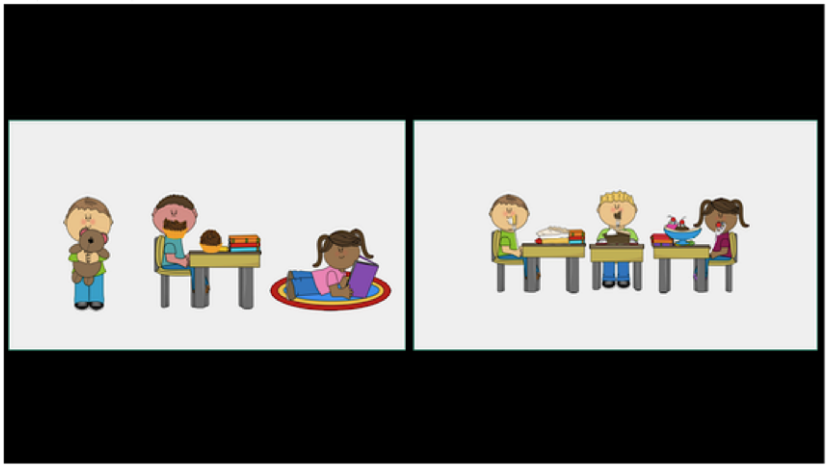
***Screen 3:*** Ó, olha agora!
'Oh, look now!'

***Screen 4:*** Veja aqui.
'See here.'

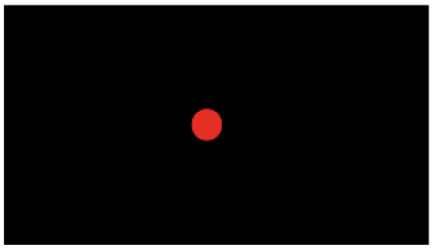


***Screen 5:*** Ei, olha aqui!
'Hey, look here!'

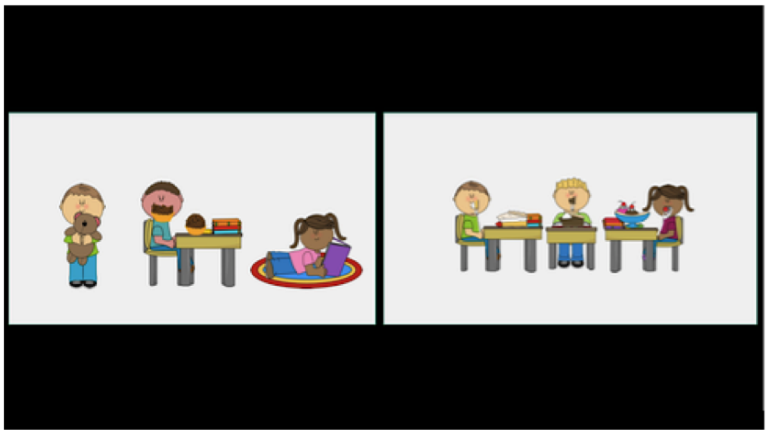
***Screen 6:*** A gente pode ver os dois!
'We can see both!'



***Screen 7:*** Nessa escola *e* tem que PRO comer doce.
In.this school has that eat:INF dessert
'In this school one has to eat dessert.'



***Screen 8:*** Nessa escola *e* tem que PRO comer doce.
In.this school has that eat:INF dessert
'In this school one has to eat dessert.'



*Source: author*

**Source:** author, on children and objects available at:
https://www.mycutegraphics.com/graphics/graphics.html

The first four screens are paired with a familiarization audio with the clips alternating between right and left. Besides having the function to familiarize the child with the experiment, the first four screens also teach the child how the experiment will work, making her/him look to the direction in which the clip appears. *Screen 6* corresponds to the baseline trial: here the test stimulus is presented for the first time, but it is not paired with the test-sentence: it is paired with a non-directing audio instead. The function of the baseline trial is to show whether the child has any visual preference for either stimulus. When analyzing the data, we can tell with the baseline trial whether the results are due to a visual bias or linguistic knowledge. In *Screen 7*, the child hears the test sentence for the first time without the visual stimulus (with a red blinking light). In *Screen 8*, the test sentence is paired with the test stimulus. If the child knows that the referential reading of the pronoun is blocked in BP, the child will look more quickly and longer at the clip that shows "students in general" eating dessert (generic reading) than at the clip showing just one student eating dessert (referential reading).

In contrast to the TVJT task presented previously, the images prepared for the IPL task intend to be simple, not distracting for 2- and 3-year-olds from the main point: choose whether or not the null subject can have the referential reading. This is why the images are presented in a white background. Another important point is that, in order to avoid the preference for one particular screen over another, we keep the number of characters constant in both screens and randomize the target side.

**Concluding Remarks**

In the present paper, I discussed results of an experiment conducted with children acquiring BP as their native language, from the age of 4;0 to 7;0. The experiment used the TVJT as a method. My objective was to see (i) if children knew that the null subject in an impersonal construction has the generic reading in BP and also (ii) if children would rule out the referential reading of the null pronoun, not available for native speaker adults of BP in the constructions tested.

The results of this experiment show that children acquiring BP as young as 4 years of age correctly assign the generic reading to the null subject in impersonal sentences and rule out the referential reading of the null subject. With these results, I concluded that 4-year-olds already know BP is *not* a consistent null subject language. I then discussed if we could conclude that all 4-year-olds already know that BP is a partial null-subject language. As we expect children would exhibit the same performance if they thought they were acquiring a radical pro-drop language (*i.e.* rejecting the referential reading of the null subject in the constructions tested and allowing the generic reading of the null subject), this conclusion cannot be extracted from this experiment. It can only be concluded that 4-year-olds acquiring BP already know they are *not* acquiring a consistent null-subject language such as EP.[19]

Based on the fact that the age of acquisition of null impersonal constructions is reported to be 2 years old in Estonian (TORN-LEESIK; VIJA, 2012), I proposed an experiment using the Intermodal Preferential-Looking (IPL) paradigm to test 2- and 3-year-olds acquiring BP. This experiment has the potential to show whether (i) null generic pronouns in Estonian are acquired early because impersonal

19 As an anonymous reviewer observed, a more complete study on the acquisition of impersonal structures in BP should take into account the existential reading of the null pronoun in the language, not only the generic one. As Carvalho (2019) discusses, sentences such as *Naquela loja vendeu café por muito tempo* ('Someone sold coffee in that store for quite some time') have an existential reading in BP, that is, they have the interpretation that a non-specified person sold coffee in a certain store. Existential impersonals with a null subject are possible in BP, a partial null-subject language, but not in consistent null-subject languages such as EP. Therefore, it would be relevant to conduct a study seeing how children acquiring BP interpret existential impersonals. In the study presented here, impersonals could not be interpreted as existential, due to the presence of the deontic modal and the law-like background present in all the test sentences and their stories (see note 4).

is regarded as a basic construction in Estonian or (ii) null generic pronouns are acquired early across different languages.

If it can be demonstrated that children acquiring BP have a very early knowledge of null impersonals, as happens in Estonian, we can ask how children attain this knowledge. How could we explain the early knowledge of generic pronouns? How do children learn that a certain pronoun can express an abstract property such as genericity? If 2-year-olds already have this sophisticated knowledge, could it not be the case that all children start out with a grammar which allows generic null subjects and blocks referential ones whenever generic null subjects are possible?[20] If children start out with a grammar that allows generic pronouns, that would implicate that children acquiring consistent null-subject languages incorrectly assign the generic reading to the null subject at some point (as if they were acquiring a radical or partial null-subject language) and later shift to a consistent null-subject grammar in which the null subject has the referential reading. How about children acquiring non-null-subject languages such as English or Swedish? Do they, at some point in their development, allow generic null subjects? In order to test the hypothesis that children start out with a grammar that allows generic null subjects it would be interesting to conduct the IPL experiment proposed in section 6 with children acquiring consistent and non-null-subject languages, in addition to conducting it with children acquiring partial null-subject languages such as BP.

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20 A similar question is asked by Gelman *et al*. (2008) regarding generic NPs (*e.g. birds lay eggs*): generic expressions are a challenging problem for the child, since they are abstract (*i.e.* one cannot point to kinds, only to instances of a kind). Gelman *et al*. (2008) propose that generic NPs are the default form and non-generic NPs need to be learned by the child.

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