

Variable *ne* in the Negative Utterances of French Children and Their Caregivers

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1. Introduction

In standard French, verbs are negated by adding *ne* before the verb and a negative element after (e.g. *pas*, *jamais*, *plus*, *rien*, or *personne*) However, in colloquial speech, speakers frequently drop preverbal *ne* (see Table 1).

Table 1. Examples of French negative sentences

	Standard French	Colloquial French
a. 'I don't know'	<i>Je ne sais pas</i> I neg know not	<i>Je sais pas</i> I know not
b. 'I never smoke'	<i>Je ne fume jamais</i> I neg smoke never	<i>Je fume jamais</i> I smoke never

The variable omission of *ne* in colloquial French is thought to have originated in the 17th Century (Hirschbühler & Labelle, 2004; Martineau & Mongeon, 2003; Palasis, 2015), and have become increasingly common in recent decades (Agren, 1973; Armstrong & Smith, 2002; Ashby 1981, 2001). As a result, the standard form *ne* occurs only rarely in modern colloquial French, with reported ne-retention rates ranging widely from 36.7% to less than 1% in adult speakers, with an average of around 12.7% (Sankoff & Vincent, 1980; Ashby, 1981, 2001; Coveney, 1996; Pooley, 1996; Armstrong, 2002; Berit Hansen & Malderez, 2005).

Despite being rarely attested, ne-retention in colloquial French appears to be conditioned by several factors both internal and external to the language. Among language-internal constraints, ne-retention has been shown to depend on both the preceding subject and the post-verbal negative element. Speakers are most likely to realize *ne* when it is preceded by full NPs, followed by null subjects, followed

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by non-clitic pronouns (*ceci, qui, cela, lui, ça*), followed by clitic pronouns (*je, tu, il(s), elle(s), nous, vous, on, ce*) (Agren, 1973; Armstrong & Smith, 2002; Coveney, 1996; Martineau & Mongeon, 2003). Speakers are also more likely to omit *ne* when the post-verbal negative morpheme is *pas* compared to *jamais, plus, rien*, or *personne* (Armstrong & Smith 2002). Among language-external constraints, *ne*-retention has also been shown to be conditioned by many social factors. For example, *ne* is realized more often by linguistically conservative speakers and may be used to signal higher socio-economic status (Armstrong & Smith, 2002; Coveney, 1996). It is also one of the French variables that most actively participates in style-shifting, with *ne* realized much more frequently in formal contexts (Coveney, 1996).

While a great deal is known about the patterns of *ne*-retention in interadult colloquial French, less attention has been devoted to understanding how children acquire and use this particular sociolinguistic variable in French. One question of interest is whether children's input reflects the same *ne*-retention patterns we observe in speech between French-speaking adults. Given that rates of *ne*-retention are low in adult-to-adult colloquial French, one might expect *ne*-retention rates to be similarly low in child-directed speech. However, another possibility is that the rate of *ne*-retention in children's input is actually *higher* than in adult-to-adult colloquial French. Across many other sociolinguistic variables, caregivers have been shown to increase, or boost, their use of standard forms in their child-directed speech (e.g. Foulkes, Docherty & Watt, 2005; Roberts, 2002; Smith, Durham & Fortune, 2007; Smith, Durham & Richards, 2013). For example, in Tyneside, England, Foulkes and colleagues (2005) found that, while word-medial and word-final prevocalic /t/s are rarely realized as the standard form [t] in interadult speech (~10%), caregivers realize the standard form much more often in their speech to young children (59%). Similarly, in Buckie Scotland, Smith and colleagues (2007) found that, instead of using the local monophthong form, pronouncing the word "house" as "hoose", nearly categorically as they do in interadult speech (thus almost never use the standard pronunciation "house"), parents boosted their use of the standard form to 43% when interacting with their children. Researchers have argued that this boosting is the caregiver's way of facilitating learning (either implicitly or explicitly) of the standard form, particularly when it is rarely attested in colloquial speech. Therefore, *ne* is an ideal test case to examine whether such boosting for a rare standard form will be attested in the morphosyntactic domain.

So far, only a few studies have investigated *ne*-retention in child-directed speech and findings have been mixed. Choi (1986) and Culbertson (2010), for example, found that French-speaking caregivers retained *ne* only rarely in speech to their children, at similar rates that have been reported for interadult corpora (Choi 1986¹ reported 8% (p.g. 70) and Culbertson 2010 reported 7.6% (p.g. 95)). On the other hand, Sankoff (2019b) analyzed two French-Canadian child-

¹ Choi 1986 analyzed the caregiver speech of two French mothers and one French-Canadian mother, but they were not analyzed separately.

caregiver dyads — Adele (1;9–2;6) and her mother and Olivier (1;11–4;1) and his father — and found ne-retention rate to be significantly boosted over the interadult level. These parents used *ne* in nearly 20% of all negative utterances to their children — 19.8% (N=49) and 18.4% (N=86) respectively — while French-Canadian adults are reported to retain *ne* only 1% of the time (Sankoff & Vincent, 1980).

Another question of interest with regard to children's input is whether ne-retention in child-directed speech is dependent on the child in some predictable way. For many sociolinguistic variables, researchers have found caregivers' use of the standard form in child-directed speech to depend on the age and/or gender of the child. For example, both Foulkes et al. (2005) and Smith et al. (2007), found that parents used the standard form less as their children grew older, presumably a function of gradually treating their children as equal — or more adult-like — conversational partners. Foulkes et al. (2005) further reported that such parental modulation is more prevalent in speech to girls than in speech to boys, with caregivers using the standard form more often with girls, perhaps out of implicit or explicit motivation to bias female children to the more positively-evaluated variant. Only one study has reported age-dependent pattern in caregivers' speech with regard to *ne*: Sankoff (2019b) found that Olivier's father used much less *ne* as Olivier approached four — consistent with the hypothesis that parents initially boost their use of the standard form, using it less often (and more aligned with rates in interadults speech) as their children grow older (Foulkes et al., 2005; Smith et al., 2007). However, since the study relied on data from only one father, further investigation using a larger and more representative sample and quantitative methods is largely called for.

Our final research question is whether and how French-acquiring children use *ne* in their own productions. To date, only a handful of attestations of *ne* have ever been reported in children's speech, making this aspect of children's acquisition particularly difficult — even impossible — to study quantitatively. While Choi (1986) and Culbertson (2010) did not specifically analyze *ne* in children's early productions, Sankoff's (2019b) reanalysis of Choi's (1986) data confirmed that Adele did not produce *ne* at all during the study (1;9–2;6), despite her adult-like mastery of other negative elements in the grammar. Olivier, on the other hand, did produce *ne* a few times, first at the age of 2;09 and twice (out of 20 negative utterances) in his last recording at age 4 (Sankoff, 2019b). Beyond Sankoff (2019b), to our knowledge, only one additional study has investigated children's production of *ne*, and on a somewhat larger scale. Palasis (2015) reported that ne-realization was extremely rare for children, and did not significantly increase as children grew older (1.2% in children aged 2;4–4;0 and 1.8% in children aged 3;6–4;11). In fact, across the two corpora analyzed, *ne* was so rarely attested (in a total of 20 utterances) that they could not quantify whether ne-retention changed over age.

To summarize, in the present study, we focus on the patterns of French ne-retention in children's language input and in their own production. This variable is of particular interest because the rare attestation of the standard form makes it

an ideal test case for parents boosting behavior in the morphosyntactic domain, and also allows us to observe children's acquisition of a variant with scarce positive evidence. While a small number of studies have investigated *ne*-retention in children and their language input, many aspects of *ne* acquisition remain unclear. In the present study, we seek to address these open questions by investigating *ne* on a larger scale corpus analysis consisting of 14 French families across 6 different CHILDES corpora, with recordings of children as young as 1 year and up to 8 years. Our first aim is to understand the nature of *ne* in children's language input by asking 1) whether *ne* is rare in child directed-speech (as it is in interadult colloquial French), 2) whether caregivers show significant boosting of the standard *ne* form in speech to their children (either in general or dependent their child's age or gender). Our second aim is to provide a quantitative analysis of the acquisition pattern of the *ne* variable by children — the first of its kind to our knowledge — specifically asking 3) at what age children begin to show variable use of *ne*, and 4) whether *ne* production differs by child's gender and how it changes over age.

2. Method

To address these research questions, we analyzed day-to-day speech of 14 monolingual French children (8 boys and 6 girls) and their caregivers selected from six French corpora in the CHILDES database (Bassano & Mendes-Maillochon, 1994; Champaud, 1994; Demuth & Tremblay, 2008; MacWhinney, 2000; Morgenstern & Parisse, 2012; Plunkett, 2002; Suppes, Smith & Leveillé, 1973; Yamaguchi, 2012). To capture a representative sample of French-learning children's everyday language experience, we selected only corpora recorded in French homes while families engaged in natural conversation. Further, we selected only families whose children had at least one recording beyond age 2;05. In a preliminary analysis of the Paris corpus, we found 2;05 to be the average age at which children first produced *ne*. All corpora analyzed are described in Table 2, arranged by year of recording.

Table 2. Corpora Analyzed

Corpus	Age Range	Region	Recording Year	N Children
Leveille	2;01-3;03	Paris	1971-1972	1
Champaud	1;09-3;05	Paris	1988-1989	1
York (Anne)	1;10-3;05	Paris	1997-1998	1
Lyon	0;11-4;00	Lyon	2002-2005	4
Paris	0;10-8;01	Paris	2005-2008	6
Yamaguchi	1;03-4;03	Paris	2006-2009	1
Total				14

To extract the negative utterances from each corpus, we used a regular expression pattern match targeting post-verbal *pas*. We focused on *pas* in the current analysis because it is the most common negator in French and is the first expression of clausal negation children acquire after the anaphoric negator “non” (no) (Dimroth, 2010), leaving other negative elements like *personne*, *jamais*, *plus*, *que*, etc. for future work.

After extraction, we manually checked each utterance for errors and removed any non-alternating contexts in which it is impossible to realize *ne*. After this manual cleaning, 24222 negative utterances remained, 6887 of which were uttered by children themselves. We coded these negative utterances for corpus region, corpus decade, speaker id, speaker type (caregiver or child), child id, child age, child gender, and whether *ne* was realized or not.

To determine the rate of *ne*-realization in caregivers and children and factors constraining their patterns of use, we built separate logistic mixed-effect regression models for child and caregiver utterances using the *lme4* package (Bates et al., 2015) in R (R Core Team, 2021). In each model, we predicted whether *ne* was realized by child age (in months, scaled and centered), and child gender, corpus region (Paris vs Lyon) and corpus decade (an ordinal category with four levels: 1970s, 1980s, 1990s and 2000s) as fixed effects with random by-child intercepts and random slopes for child age.

To test whether a caregiver’s rate of *ne*-retention impacted their child’s patterns of use, we built two additional simple linear regression models. In one model, we used the caregiver’s average *ne*-retention before their child’s first attestation (log transformed) to predict the age at which their child first produced *ne*. In another model, we used the caregiver’s average *ne*-retention rate (log transformed) to predict the child’s average *ne*-retention rate (log transformed).

3. Results

3.1. Region and decade of recording

Consistent with reports of regional differences in *ne* usage in inter-adult speech (Ashby, 2001; Armstrong & Smith, 2002; Coveney, 1996; Pooley, 1996), region of recording was a significant predictor of *ne*-realization in both our caregiver and child models. Both caregivers and children in Paris were significantly more likely to realize *ne* than those in Lyon (Caregivers: $\beta=0.672$, $SE=0.336$, $p=0.045$; Child: $\beta=0.850$, $SE=0.344$, $p=0.013$). In contrast, despite reports of the rapid decline of *ne* usage in interadult speech in recent decades (Ashby, 1981, 2001; Armstrong & Smith 2002), we did not find a decreasing trend in *ne*-realization by decade in our child or caregiver model.

We want to emphasize that one should interpret our observed differences in region and decade with caution, given the large individual differences among caregivers in our sample, even in the same corpus. To cite a dramatic example, though both Julie and Theophile’s parents are middle-class Parisians in their thirties in the early 2000s, Julie’s parents realized *ne* 33.99% of the time, whereas Theophile’s parents realized *ne* only 3.5% of the time. Indeed, these individual

differences coupled with the over-representation of data sampled from Paris in the early 2000s may have skewed any apparent-time or regional differences we might otherwise observe in the population.

3.2. Rate of *ne*-realization by children and their caregivers

We turn next to the rate of *ne*-realization by children and their caregivers. We hypothesized that *ne* would be rare in child-directed speech, given that *ne* is reported to be rare among adult speakers of colloquial French (Sankoff & Vincent, 1980; Ashby, 1981, 2001; Coveney, 1996; Pooley, 1996; Armstrong, 2002; Berit Hansen & Malderez, 2005) and in small samples of child-directed speech by French-speaking mothers (Choi (1986): 3 mothers, 8%; Culbertson (2010): 5 mothers, 7.6%). Further, we hypothesized that *ne* would be similarly (or even more) rare in children's own productions, given that there have been only 23 attestations of *ne* ever reported in children's negative utterances (3 in Sankoff's (2019b) analysis of Olivier and 20 in Palasis (2015)'s analysis of two corpora).

Table 3 shows the overall rate of *ne*-retention for all children and their caregivers in our sample, arranged by corpus and caregiver retention rate. For caregivers, the average rate of *ne*-retention was relatively low (mean=8.49%), though the range among individuals was quite wide. Julie's caregivers realized *ne* most often, in 243 of 715 negative utterances (33.99%) while Anais's caregivers realized *ne* the least, in just 46 of 2636 negative utterances (3.00%). Results from our logistic mixed-effect model confirm our observations: *ne* is rarely attested in speech to young children. Our caregiver model has a significant negative intercept, indicating the log odds of *ne*-realization are significantly lower than chance (50%) among caregivers in our sample ($\beta=-1.873$, $SE=0.453$, $p<0.001$). Our results are consistent with the low rates of *ne*-realization reported by Choi (1986) and Culbertson (2010), lending further support to the notion that *ne* occurs only rarely in child-directed speech.

Table 3. Use of *ne* in negative utterances (*neg*) by each child and their caregivers, arranged by corpus. Asterisk (*) indicates the first negative occurs in the child's first available recording.

Child	Gender	Age range	Age of first		Child ne		Caregivers ne		
			neg	ne	ne/neg	%	ne/neg	%	
Leville									
Phillippe	M	2;01-3;03	2;01	2;02	11/806	1.36	104/1389	7.49	
Champaud									
Gregoire	M	1;09-3;05	1;09*	2;05	2/153	1.31	52/188	27.66	
York									
Anne	F	1;10-3;05	1;10*	1;11	3/567	0.53	17/434	3.92	
Lyon									
Marie	F	1;00-4;00	1;00*	2;05	9/554	1.63	294/2026	14.51	
Nathan	M	1;00-3;00	1;10	2;06	3/152	1.97	83/1582	5.25	
Theotime	M	0;11-3;00	1;04	2;04	3/397	0.76	78/1857	4.20	
Anais	F	1;00-3;00	1;11	2;09	1/364	0.55	49/2636	3.00	
Paris									
Julie	F	0;10-8;01	1;11	2;06	24/262	9.16	243/715	33.99	
Antoine	M	1;00-6;03	1;06	2;05	38/612	6.21	179/1552	11.53	
Anae	F	1;04-5;10	1;04*	2;04	23/606	3.80	135/1209	11.17	
Leonard	M	1;08-3;02	1;08*	2;04	4/232	1.72	52/643	8.08	
Madeleine	F	1;00-6;11	1;07	2;04	47/1031	4.56	74/1099	6.73	
Theophile	M	1;00-4;11	2;02	2;11	9/662	1.36	64/1827	3.50	
Yamaguchi									
Adrien	M	1;03-4;03	2;08	2;10	11/489	2.25	47/1178	3.99	
Mean of all children			1;08	2;05		2.73%		8.49%	

For children, we found the average rate of *ne*-realization to be even lower than their caregivers (mean = 2.73%). Among the children in our sample, Julie realized *ne* most often, in 24 of her 262 (9.16%) negative utterances, while Anne realized *ne* the least, in just 3 of her 567 (0.53%) negative utterances. As in our caregiver model, our child model revealed a significant negative intercept, indicating that that log odds of *ne*-realization were significantly lower than chance (50%) in children's productions ($\beta=-4.403$, $SE=0.446$, $p<0.001$). We can also observe from Table 3 that children retained *ne* less often than their caregivers on average (mean difference = 7.72%), and no child retained *ne* more often than their caregivers.

3.3. Acquisition of variable *ne* by age and gender

Beyond the average *ne*-retention rate in children and their caregivers, we also asked whether children's acquisition of *ne* differed by child age or gender. While previous reports of children's *ne*-retention has been limited — neither Sankoff (2019) nor Palasis (2015) had sufficient data to analyze the developmental trajectory of *ne* in children — researchers have found age- and gender-dependent patterns in children's acquisition of other sociolinguistic variables. For example, many researchers agree that, while children can produce variable forms from a young age, they may not show adult-like knowledge of the constraints governing this variation until they are older (e.g. Labov, 1989; Miller, 2013; Roberts, 1994, 1997; Shin, 2016; Smith et al., 2007, 2013). Further, for some variables, female children are more likely to use standard variants than their male peers (Fischer, 1958; Purcell, 1984; Roberts, 1997; Romaine, 1978).

We begin by describing the age at which children in our sample first produce *ne* in negative utterances. As shown in Table 3, on average, children produce their first negative utterance at 1 year, 8 months. However, children produce their first *ne* nine months after producing their first negative sentence (mean age = 2;05) on average. Annie is the first to realize *ne* in a negative sentence at 1 year, 11 months (e.g., *Ils n' entendent pas*. 'They can't hear.'), while Theophile is the last, at 2 years, 11 months (e.g. *(Je) n' ai pas fait encore*. 'I haven't done it yet'). Taken together, these observations suggest that children begin producing negative sentences around 1 year, 8 months, but do not produce the standard form, *ne*, until sometime between 2 to 3 years of age.

While children do not initially produce *ne* in negative sentences, their *ne*-retention is indeed age-dependent. In our child model, child age is a significant predictor of *ne*-retention ($\beta=0.621$, $SE=0.102$, $p<0.001$). As shown in Figure 1, *ne* is unattested in the youngest children, but approaches the adult level of *ne*-retention as the children grow older. Gender, on the other hand, was not a significant predictor of *ne*-retention in our child model. Male children are no less likely to realize *ne* than their female peers ($\beta=-0.241$, $SE=0.260$, $p=0.354$).

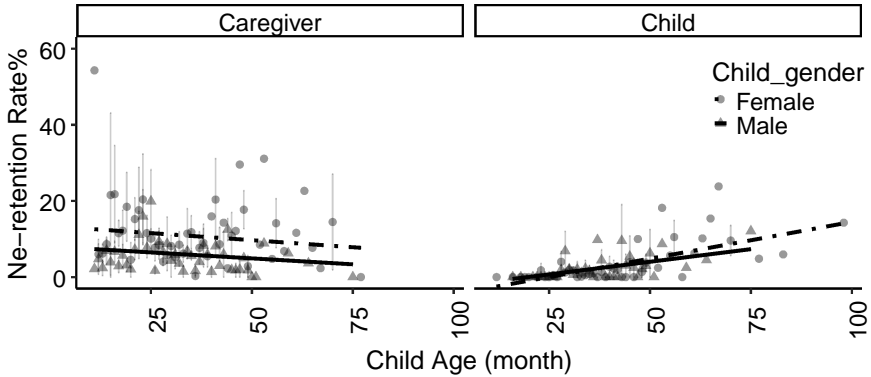


Figure 1. Average ne-retention rate for caregivers and children by child age in months and child gender. Error bars reflect standard error.²

3.4. The role of the input on the acquisition of variable *ne*

To investigate the role of children’s input on their acquisition of *ne*, we first ask whether caregivers bias their children toward *ne*-realization early in the acquisition process. Previous studies have demonstrated that caregivers tend to boost their use of the standard form in child-directed speech when their children are young, then gradually reduce usage as their children age (Foulkes et al., 2005; Smith et al., 2007). Researchers have hypothesized that such boosting may have a facilitative effect on the acquisition of (otherwise rarely attested) standard forms. However, while preliminary evidence suggests a similar age-dependent pattern for *ne*-realization in child-directed French — Sankoff (2019b) reported that Olivier’s father realized *ne* less often as Olivier approached age four — we found no such pattern in our sample of child-directed speech. In our caregiver model, child age was not a significant predictor of *ne*-realization ($\beta=-0.070$, $SE=0.109$, $p=0.521$), indicating that caregivers in our sample did not boost their *ne*-realization rate when their children were young (or otherwise adjust their *ne* usage based on their child’s age, see Figure 1).

Next, we investigated another property of the input commonly reported in the developmental sociolinguistic literature: gender-dependence. Recall from section 3.3 that we did not find children’s *ne*-retention to differ by gender. However, for many sociolinguistic variables, researchers have found that the input itself differs by child gender, with caregivers using more positively-evaluated variants with girls than boys (e.g. Foulkes et al., 2005). For *ne*, however, we found no such pattern. In our caregiver model, child gender was not a significant predictor of *ne*-realization in caregivers ($\beta=-0.436$, $SE=0.346$, $p=0.204$), suggesting that caregivers do not use more *ne* with girls than boys.

² We are aware that the first datapoint at 11 months for caregivers is very high. However, it is within 3 standard deviations of the mean *ne*-retention rate and therefore not excluded.

Finally, while we did not find any age- or gender-dependent patterns in our sample of child-directed speech, we did find that children are very sensitive to the input from their caregivers. As shown in Figure 2 (left), we found that caregivers with the highest *ne*-retention rate had children who produced *ne* the earliest ($\beta = -2.100$, $SE = 0.728$, $p = 0.014$). By the same token, as shown in Figure 2 (right), caregivers with the highest *ne*-retention had children who produced more *ne* overall ($\beta = 0.771$, $SE = 0.285$, $p = 0.019$). Taken together, these results indicate that children are indeed sensitive to the *ne* in their input — caregivers who use more *ne* have children who produce *ne* earlier and at higher rates — but caregivers do not tailor their *ne*-retention rate to their child's age or gender.

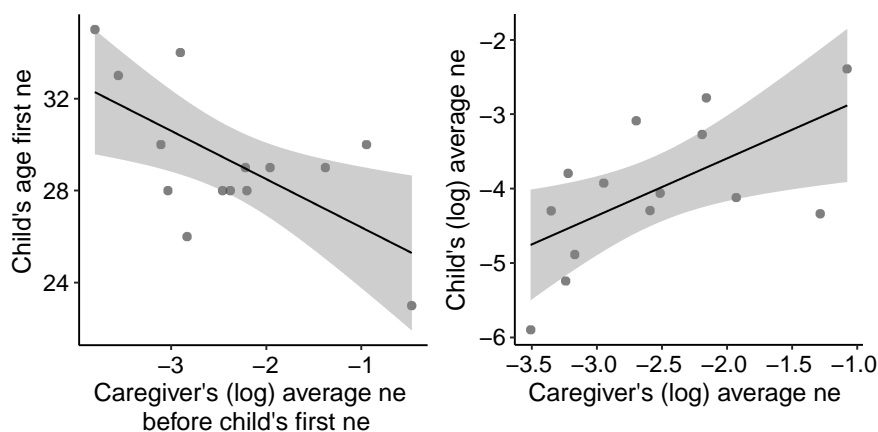


Figure 2. Caregiver's average *ne*-retention before their child's first attestation (log transformed) predicts the age at which their child produced *ne* (left). Caregiver's average *ne*-retention rate (log transformed) predicts their child's average *ne*-retention rate (log transformed).

4. General Discussion

With a corpus analysis of 14 French learning children and their caregivers, we investigated the use of variable *ne* in children's language input and early production. In this section, we return to the four research questions outlined in the introduction and discuss our results in the broader context of children's acquisition of linguistic variation.

First, our results show that, in general, *ne* is as rare in child-directed speech as it is in interadult colloquial French. On average, caregivers in our sample realized *ne* in 8.49% of their child-directed negative utterances, which corroborates previous reports of child-directed speech based on smaller samples (Choi, 1986: 8%; Culbertson, 2010: 7.6%) and is similar to many recent reports of interadult speech (Sankoff & Vincent, 1980; Ashby, 1981, 2001; Coveney, 1996; Pooley, 1996; Armstrong, 2002; Berit Hansen & Malderez, 2005). Recall that this similarity was not guaranteed: many previous studies have observed that

caregivers boost their use of standard variants in speech to their children (e.g., Foulks et al., 2005; Smith et al., 2007). On the same variable, Sankoff (2019) found evidence of such boosting for *ne* among Canadian French speaking families: Adele and Olivier's parents used *ne* in nearly 20% of their negative utterances — dramatically more often than Canadian French interadult speech (1%). In our current dataset, however, although there are also individual caregivers with higher *ne*-retention rate (e.g. Julie's mother: 33.99%), most caregivers in our dataset realize *ne* rarely, at a rate comparable to what's reported for inter-adult speech.

Therefore, with regard to our second question, we did not find evidence that caregivers boost their use of *ne* in child-directed speech compared to interadult speech. Importantly, however, we compared caregivers' speech with previous reports of *ne*-realization in interadult speech — a completely different sample of speakers, who are likely to differ in many ways (geographical region, age, socioeconomic status, method of data collection, etc). While this is the best available comparison to date, future studies would ideally compare child-directed and adult-directed speech in the *same* speakers. Another possible explanation for why we did not observe the boosting as Sankoff did in Canadian French is that there might be a stronger or more distinct prestige associated with the standard form *ne* in Canadian French. Perhaps parents would be most likely to engage in such boosting to bias their children towards the positively reliable when its positive social evaluation is salient (or when the non-standard variant is stigmatized).

Beyond general boosting of the standard form, we also did not find evidence that caregivers' *ne*-realization was dependent on child age or gender. For other sociolinguistic variables, research suggests that parents boost their use of the standard form when their children are young (Foulkes et al., 2005, Smith et al 2007) and use more socially-favored variants with girls than boys (Foulkes et al., 2005). While Sankoff (2019) found evidence of an age-dependent pattern for *ne* specifically — Olivier's father used *ne* less often as Olivier grew up — we found that neither child age nor gender reliably predicted caregivers' use of *ne* in our bigger sample. One explanation for this difference could be regional: Olivier and his father spoke Canadian French, a dialect for which *ne*-retention is reported to be exceptionally low (1%). Perhaps caregiver boosting is employed most often (or is most necessary for acquisition) under circumstances when a variant is extremely rare.

Third, turning to children's production, our results suggest that children first produce *ne* as they approach age two (mean age = 2;05), an average of 9 months after their first clausal negation with *pas*. The delay is not surprising, given previous findings that children acquire "optional" or variably realized morphemes later than obligatory morphemes. Marrero and Aguirre (2003), for example, found that children acquiring Spanish dialects with variable /s/ lenition first produced the overt plural marker when they were age 3;0, over a year later than children acquiring the non-leniting dialects. Similarly, Miller and Schmitt (2012) found that children acquiring a leniting variety of Spanish take longer to associate a

plural interpretation with the presence of a plural marker than children acquiring a non-leniting variety.

Lastly, we found that children use *ne* more often as they grow older, but they have not yet matched their parents' rate of realization (2.73% vs 8.49%) in the age range we analyzed. No significant gender difference was detected with regard to production of *ne*. The age-dependent increase in *ne*-realization could indicate that children's grammar with regard to *ne* is still different from adults', but, notably, age-dependent increase was reported for Canadian-French speaking adults as well (Sankoff, 2019a). The same speaker of Canadian French, who was interviewed 24 years apart, increased his *ne*-realization from 0.5% at age 22 to 4.5% at age 45. Sankoff (2019a) noted that, while speakers likely internalize the probabilistic nature of *ne* as children, such protracted age dependence might indicate an evolving understanding of the social meaning of the variant, and/or a speaker refraining from using a variant until they have reached the appropriate age and status. While we did not code the social context of each negative utterance in our sample, it is reasonable to assume that children have fewer stylistically appropriate occasions to employ the standard variant. For example, while parents have many occasions to teach or discipline their children — a social context that invites the more formal *ne* — children likely have many fewer such opportunities. Indeed, a closer examination of children's mastery of the social constraints on *ne*-realization is called for. In future work, we plan to specifically analyze the topic and context (e.g. school vs play vs discipline etc.) of children's negative utterances to determine whether children control the social constraints on *ne* and from what age.

One caveat of our current analysis on the rate of *ne* is that, since we constrained our analysis to negative utterances containing post-verbal *pas*, it is possible that we have underestimated the true rate of *ne*-retention in both children and their caregivers because *pas* (among all post-verbal negative elements) is the most likely to trigger *ne* omission (Armstrong & Smith, 2002). While our analysis offers an important first step in characterizing the nature of *ne* in child-directed speech and children's own productions, a more comprehensive analysis including all post-verbal negative elements is a much needed next step.

While we have provided a quantitative analysis of the rates of *ne* in French children and their caregivers and their interaction with children's age and gender, we have not addressed whether their *ne* production is governed by the same linguistic-internal (post-verbal negative element, the grammatical category of the preceding subject) and linguistic-external constraints (social context of the conversation, socioeconomic status) observed in interadult speech. There is some initial evidence to suggest that caregivers do obey these same constraints in speech to their children (Culbertson, 2010; Sankoff, 2019b), but these studies relied on relatively small datasets (Culbertson, 2010: 5 mothers; Sankoff, 2019b: one father) and leave much room for future work to corroborate and expand these findings. On the other hand, whether children's *ne* production is governed by these constraints has remained completely unexplored because of the limited attestation of *ne* in previous literature. Therefore, a larger sample of French-speaking caregivers and children like ours would allow us to paint a more nuanced

picture of 1) whether caregivers obey these same sociolinguistic constraints on ne-retention in their child-directed speech and whether the conditioning pattern of these constraints change with the child's age or depend on the child's gender and 2) how these constraints develop in the French-acquiring child. This is precisely what we plan to do in our future investigation.

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