Morphosyntactic development and severe parental neglect in 4-year-old French-speaking

children: ELLAN Study.

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Abstract

Language is the most frequently compromised area of development in English-speaking

neglected children, particularly the morphosyntactic component of language. This is very

worrisome given its central role in academic success and social participation. No previous study

has examined the morphosyntactic skills of French-speaking neglected children, despite the

morphological richness of French. This study aimed to fill this gap.

Forty-four neglected (mean age = 48.32 months, SD = .45) and 92 non-neglected (mean

age = 48.07 months, SD = .24) French-speaking children participated. Measures of

morphosyntactic skills were derived from a sample of spontaneous language collected during

standardized semi-structured play and analyzed using Systematic Analysis of Language

Transcripts software. Four morphosyntactic indicators were compared using ANOVAs and

Kolmogorov-Smirnov tests: the mean length of utterances (MLU), verbal inflections, word-level

errors, and omission errors.

The results indicate that 25.6% of the neglected children presented clinically significant

morphosyntactic difficulties, as evidenced by a significantly shorter MLU (M = 5.60, SD = 1.13)

(M = 6.90, SD = 1.30), fewer verbal inflections and more frequent word omission errors

compared to their non-neglected peers.

The results confirm that French-speaking neglected children present many

morphosyntactic difficulties. This study argues for sustained speech-language services for these

children.

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Maltreatment refers to a set of abuses that compromise the safety, health, development and dignity of the child (Child Welfare Information Gateway, 2013). In North America, annually, nearly 400,000 children under the age of five are placed in the care of youth protection services due to maltreatment (Public Health Agency of Canada, 2010; US Department of Health & Human Services, 2017). Of all the forms of maltreatment, parental neglect is the most prevalent in North America (Association des Centres jeunesse du Québec [ACJQ], 2016; Blumenthal, 2015; Public Health Agency of Canada, 2010; US Department of Health & Human Services, 2017).

According to the Youth Protection Act of Quebec (Canada) (2007), neglect occurs when parents do not meet their child's basic physical needs (e.g. not responding to food, clothing, hygiene or housing needs), or needs related to health (e.g. failing to provide the care required for physical or mental health) or education (e.g. failing to provide appropriate supervision or not taking the necessary means to ensure schooling). This definition is very close to that used in the United States, where neglect refers to a parent's failure to act, leading to a serious risk of harm with regard to the security and development of the child (US Department of Health & Human Services, 2017).

In the province of Quebec, parental neglect affects nearly seven out of every thousand children aged 5 or under (Observatoire des tout-petits, 2017). Indeed, being highly dependent on their parents, young children are most at risk of being neglected (Observatoire des tout-petits, 2017). Given the nature of neglect, when parents do not recognize their child's basic needs, this has repercussions on the child's development from an early age, including language development in particular.

Parental Neglect and Language Development

Language is the most frequently affected area of development among neglected children (McDonald, Milne, Knight, & Webster, 2013; Scarborough, Lloyd, & Barth, 2009; Sylvestre, Bussières, & Bouchard, 2016; Sylvestre & Merette, 2010). Nearly one out of two neglected children (41.7%) show significant language difficulties as early as age three (Sylvestre & Mérette, 2010). This prevalence largely exceeds that observed in the general population, which ranges between 10 and 20% (Collisson et al., 2016; Zubrick, Taylor, Rice, & Slegers, 2007).

Among English-speaking neglected children, morphological and syntactic difficulties have been noted in particular (Beeghly & Cicchetti, 1994; Coster, Gersten, Beeghly, & Cicchetti, 1989; Eigsti & Cicchetti, 2004; Fox, Long, & Langois, 1988). Morphological skills refer to the use of units of meaning, or morphemes, to form words or mark grammatical inflections (Bernicot & Bert-Erboul, 2009). Syntactic skills refer to the ability to organize words to form cohesive and coherent utterances (Bernicot & Bert-Erboul, 2009, Storch & Whitehurst, 2002). The morphosyntactic difficulties documented among English-speaking neglected children are evident as early as 2½ years of age, with their utterances showing significantly fewer grammatical inflections and between 0.5 and 0.8 fewer morphemes compared to their non-neglected peers (Beeghly & Cicchetti, 1994, Coster et al., 1989).

These difficulties appear to persist up to the age of entry into school. Indeed, Eigsti and Cicchetti (2004) showed that the level of morphosyntactic development among neglected 5-year-olds is, on average, 16 months behind what is expected for their age. This delay is evidenced by utterances featuring less complex syntactic structures and significantly more frequent omissions of the verbal auxiliary, compared to those of non-neglected children of the same age (Eigsti & Cicchetti, 2004). The level of acquisition of the morphosyntactic component of language among

French-speaking neglected children is currently unknown. Compared to English, French has a greater diversity of verbal and gender inflections (Thordardottir, 2005). Thus, it is expected that French-speaking neglected children will experience even more significant morphosyntactic difficulties. Based on the literature available on French-speaking children with language difficulties, grammatical morphology related to verbs and pronouns is likely to be weaker among neglected children compared to their non-neglected peers (Thordardottir & Namazi, 2007). Indeed, as they are exposed to less complex language stimulation compared to their non-neglected peers (Eigsti & Cicchetti, 2004), the mean length of utterances, measured in morphemes (MLU_m), and diversity of verb tenses and modes is likely to be lower among neglected children.

The morphosyntactic difficulties presented by neglected children can lead to other developmental challenges. In fact, morphosyntactic abilities have been shown to be strongly associated with children's reading and writing skills, which, in turn, are related to their present and subsequent academic success (Adams & Bishop, 1990; Durand, Loe, Yeatman, & Feldman, 2013; Bowles, Turnbull, & Skibbe, 2009; Mackie & Dockrell, 2004; Paul & Norbury, 2012; Storch & Whitehurst, 2002).

The morphosyntactic component of language is also central to a child's social interactions, allowing for the transmission of precise and clear ideas, thus promoting communication with peers and significant adults (Bouchard, Cloutier, Gravel, & Sutton, 2008). The frequent omission of words typically characterizing the utterances produced by neglected children interferes with their message and therefore their social participation by causing breakdowns in communication. It can even lead to social rejection and significant difficulties in

adapting to school (Hildyard & Wolfe, 2002; Manly, Lynch, Oshri, Herzog & Wortel, 2013; Norman et al., 2012; Sylvestre et al., 2016).

Despite the fact that parental neglect is the most prevalent form of maltreatment in North America among children under age 5 (ACJQ, 2016; Blumenthal, 2015; Public Health Agency of Canada, 2010; US Department of Health & Human Services, 2016), the language development of neglected children remains under-valued (Boyce & Maholmes, 2013). Yet, the prevalence of language difficulties among neglected children far exceeds that observed among non-neglected children (Sylvestre & Mérette, 2010) and the development of their morphosyntactic skills appears to be strongly compromised, at least among English-speaking children. No previous study on the level of morphosyntactic development of neglected children has been conducted in French despite the significant morphological richness of the French language compared to English (Parisse & Le Normand, 2006, Thordardottir, 2005). There is thus clearly a need for in-depth and specific research among French-speaking neglected children.

Aims of the Study

Based on these findings, the general aim of this study was to examine the level of morphosyntactic development of French-speaking neglected children at age 4. Two specific goals derived from this: 1- to measure the level of morphosyntactic development of a sample of neglected children and compare it to that of a sample of non-neglected peers of the same age; and 2- to quantify the prevalence of morphosyntactic difficulties among the neglected children. The results will help develop knowledge on this subject related to the French language. Moreover, they will help to better target the developmental needs of neglected children and support the development of effective speech-language intervention strategies. Ultimately, this

knowledge may also have indirect effects on the medium and long-term economic and social costs arising from the language difficulties presented by neglected children (Fang, Brown, Florence, & Mercy, 2012).

Method

This cross-sectional study was part of a longitudinal study aiming to identify the personal and environmental determinants of school readiness among neglected children aged 3 to 5 years (Early Longitudinal study on Language and Neglect [ELLAN], Sylvestre, Bouchard, Pauzé, & Mérette, SSHRC: 2014-2019). The longitudinal study, currently underway, involves a sample of 71 neglected children and 99 non-neglected children. These children are met at home every six months by a research assistant to measure their level of language development and personal and environmental characteristics. The data presented in this article were collected at the third measurement time of the longitudinal study, when the children were exactly 4 years old.

Participants

The sample used in the current study derived from the longitudinal study. Our sample includes 44 neglected children (experimental group, 48.32 months, SD = .45) and 92 non-neglected children (comparison group, mean age = 48.07 months, SD = .24) for whom morphosyntactic data were available. The neglected children in our sample were slightly older than their non-neglected peers ($t_{(54.88)}$ = -3.42, p = .001). Since this difference was minimal (a few days' difference in age between the two groups) and had no clinical impact on language skills, the age of the participants was not controlled for in the subsequent analyses. Overall, compared

to the comparison group, the experimental group presented more socio-economic risk factors,

namely, single parenthood, poverty, low education and unemployment.

Table 1

Sociodemographic characteristics (N=136)

	Non-neglected children N=92 n (%)	Neglected children N=44 n (%)	Pearson chi-square	Group effect p-value
Gender (boy)	45 (48.9)	29 (65.9)	2.82	.0934
Single-parent	3 (3.3)	20 (45.5)	34.77	< .001
Living under poverty threshold (Quebec, 2014)	2 (2.2)[a]	18 (52.9)[b]	42.78	< .001
Level of education of principal respondent (< 12 years)	4 (4.3)	24 (54.5)	42.86	< .001
Occupational status of principal respondent (unemployed)	17 (18.9)[c]	19 (52.8)[d]	12.86	< .001

Note. [a] n = 89, [b] n = 34, [c] n = 90, [d] n = 36.

The neglected children were recruited in four urban area youth centers (YCs) in Quebec

City and Montreal (Canada), whose mission is to ensure the protection and well-being of

maltreated children. The status of parental neglect was confirmed by the psychosocial workers in

the participating YCs responsible for monitoring these children and their families. To participate

in the study, the children in the experimental group had to: 1- have been placed in the care of a

YC on grounds of parental neglect or a serious risk of neglect, 2- have been exposed to French

more than 90% of the time since birth, according to parental report, such that their development

was considered comparable to that of unilingual French-speaking children (Pearson, Fernandez,

Lewedeg, & Oller, 1997) and 3- be exactly 4 years of age at the time of data collection. Children

who had lived less than one month with their biological family and those with a medical

condition associated with language difficulties (e.g. deafness) were excluded. Of the 44

neglected children, 27 (61.4%) were living with their biological family, 7 (15.9%) were living

with an extended family member, and 10 (22.7%) were living with a foster family.

The non-neglected children were also recruited in the urban areas of Quebec City and

Montreal (Canada). Participants in this comparison group were exactly the same age and had the

same level of exposure to French as the children in the experimental group and, like their

neglected peers, had not received speech-language pathology services at the time of entry into

the longitudinal study.

Material and procedures

Collection of language sample. The data were collected through a 60-minute in-home

interview with the child and their main parental figure. The researcher completed the

questionnaires with the parent, updating the sociodemographic data collected at the beginning of

the longitudinal study, and then collected the sample of spontaneous language needed to assess

the morphosyntactic component. The sample of spontaneous language was collected through the

Jeu de village (Sylvestre, Di Sante, Julien, Bouchard, & Leblond, submitted). This activity

involves standardized semi-structured play between the child and a research assistant, using

familiar material including a fire station, house, gas station, figurines (a boy, a girl, two firemen,

and a dog), three cars and a fire truck. During this 15-minute period of play, the interviewer

follows a predetermined scenario to ensure that the measure is administered in a standardized

way, providing all participants with the same opportunities to talk. The exchanges during this activity were recorded on video for later analysis.

Measures. The most accurate way to evaluate the level of development of the morphosyntactic component is to analyze a sample of spontaneous language (Costanza-Smith, 2010; Miller, Andriacchi, & Nockerts, 2016; Paul & Norbury, 2012; Rice, Smolik, Perpich, Thompson, Rytting, & Blossom, 2010; Royle & Stine, 2013; Thordardottir, 2015; Thodardottir, 2016). This procedure makes it possible to highlight indicators that are not necessarily solicited in standardized tests, and, above all, shows great ecological validity (Costanza-Smith, 2010; Parisse & Le Normand, 2006; Thordardottir, 2016). Indeed, the language sample collected in this context is very similar to the language used in children's usual communication environment. The analysis of such a sample allows for the calculation of the MLU in morphemes and the diversity of verbal inflections (tenses and moods), which constitute the most robust indicators of the level of morphosyntactic development (Parisse & Le Normand, 2006; Paul & Norbury, 2012; Rice et al., 2010; Thordardottir, 2005).

More precisely, the calculation of the MLU in morphemes takes into account all the lexical and grammatical inflections produced by the child and, in this sense, draws a more complete portrait of language skills than does the MLU calculated in words (Bernicot & Bert-Erboul, 2009). Considering the morphosyntactic richness of French, it is strongly recommended to use other markers of development, such as the number of verbal inflections (tenses and moods) and errors, in order to highlight the variety of skills exhibited by children (Prigent, Parisse, Leclercq, & Maillart, 2015; Thordardottir, 2005). The analysis of these markers identifies precisely the morphosyntactic elements that contribute to the production of longer sentences among French-speaking children (Prigent et al., 2015).

The MLU in morphemes and number of verbal inflections were thus complemented by a comparative analysis of the word-level (words, morphemes) and omission (words) errors made by the children. Word-level errors correspond to the incorrect use of a word or morpheme in the utterance. Specifically, they include 1) inappropriate lexical choices, 2) inappropriate pronoun choices related to gender or the use of an immature form that is no longer expected at age 4 (e.g. "moi" instead of "je"), 3) inappropriate agreement, either verbal or number agreement, 4) inappropriate gender agreement and, lastly, 5) overgeneralization errors related to verbal inflections or the creation of a new word from the root of a word. Errors of omission, for their part, refer to the absence of a word in an utterance, for example the omission of the pronoun, verb, article, or complement (Thordardottir, 2005).

Coding. A transcript of 50 utterances per child, starting at the third minute of the recording, was drawn up by research assistants, who were language sciences or psychology students. The first three minutes were excluded to allow the child to get comfortable in the play activity. An analysis of 50 utterances is considered valid for measuring the morphosyntactic skills of young children (Logan, Piasta, Justice, Schatschneider, & Petrill, 2011; Miller et al., 2016; Paul & Norbury 2012). If the recording did not include 50 utterances starting from the third minute of play, the transcription was started earlier and continued until a sample of 50 utterances was achieved.

A coding protocol, based on the guidelines for Systematic Analysis of Language Transcripts (SALT) software (Miller, 2012) and including procedures for French set out by Thordardottir (2005), was used to code the spontaneous language samples. The use of computer software reduces the risk of errors related to coding and ensures consistency in the calculation of indicators (Miller et al., 2016). The first author and one research assistant, a linguistics student,

took the recommended SALT training program online and then coded the transcripts. The first

author coded all the language samples. To verify interrater reliability, the research assistant also

coded 30 randomly selected language samples, representing 22% of the total sample. Interrater

agreement was above 96% for all the morphosyntactic indicators. The coding differences were

resolved by the first author.

A total of 5 neglected children and 6 non-neglected children were excluded from the

analysis because they did not produce the minimum of 50 utterances allowing for a valid analysis

of their morphosyntactic skills. The final sample thus consisted of 125 participants (39 neglected

and 86 non-neglected children). The difference in proportions between neglected and non-

neglected children who did not produce 50 utterances during the *Jeu de village* (11.4% vs. 6.5%)

was not significant (χ^2 (1, N = 136) = .40, p = .53). The excluded children did not differ with

regard to gender or age ($\chi^2_{(1, 11)}$ = .16, p = .69).

Statistical Analysis

To address the first goal of the study, the level of morphosyntactic development of the

neglected children was compared to that of the non-neglected children, using ANOVAs and

Kolmogorov-Smirnov tests. Specifically, data on the MLU_m and verbal inflections (tenses and

moods) were analyzed using a generalized ANOVA model because the fit quality indicators

were better for a Gamma than for a normal model (SPSS 24, proc GENLIN; distribution =

gamma, link = log). Visual inspection of the distributions confirmed this choice. In addition,

because the shape of the distributions appeared to be different between the groups, non-

parametric Kolmogorov-Smirnov tests (KS test) were used to compare the groups with regard to

the number of word-level and omission errors made. The dependent variables were analyzed

separately because the GENLIN procedure does not allow for MANOVAs. In this case, effect sizes were calculated using the Glass delta (Hedges & Olkin, 1983). The standard deviations for the group of non-neglected children were used to standardize differences in means.

To meet the second goal, the proportion of children in each group whose MLU in morphemes was under the 10th percentile below the mean for the non-neglected children was calculated using the bootstrap method (Efron & Tibshrirani, 1993). It is recognized that when the MLU_m falls below developmental expectations between the ages of 4 and 5 years, there is a higher risk that children, as assessed by a speech-language pathologist, will present a developmental language disorder (DLD) rather than typical development (TD) (Thordardottir et al., 2011). The MLU_m appears to be a sensitive marker of a possible DLD and, as such, is important when studying the level of language development of young children.

The 10th percentile represents a clinical threshold used by speech-language pathologists to demonstrate clinically significant difficulties (Thordardottir et al., 2011). The 95% confidence interval (CI) was used to form three subgroups. These were: (1) children presenting TD, i.e. whose scores were above the upper limit of the 10th percentile CI, (2) children in the intermediate zone, i.e. whose scores were between the lower and upper limits of the 10th percentile CI, and (3) children presenting morphosyntactic difficulties, i.e. whose scores were under the lower limit of the 10th percentile CI. It is impossible to say with certainty whether participants in the intermediate subgroup presented morphosyntactic difficulties or TD. This method thus helps to avoid overestimating the prevalence of difficulties presented by the participants. A chi-square test was then used to determine whether there were differences in the proportions of neglected and non-neglected children in each subgroup (TD, intermediate, difficulties).

Results

Level of Morphosyntactic Development

The results for the different indicators of the morphosyntactic component are reported in Table 2. The ANOVAs and KS tests indicated that the neglected children presented a significantly lower level of morphosyntactic development than their non-neglected peers, for all indicators except the number of word-level errors, for which the difference between the groups approached the significance level but did not reach it ($Z = 1.101$, $p = .059$). Effect sizes were medium to large (Glass' Δ = .6 to 1). The effect sizes were particularly large for the MLU_m (Glass 'Δ = 1, $p < .001$), followed by the frequency of omission errors (Glass' Δ = .93, $p = .006$) and the number of verbal inflections (Glass' Δ = .6, $p = .002$). Comparative analyses were also conducted to assess gender differences in the subsample of neglected children. No significant differences were found between neglected girls and boys for any of the morphosyntactic indicators measured in the study (p > .05).

Table 2

Comparison of level of morphosyntactic development of neglected and non-neglected children (N=125)

	Non-neglected children N=86		Neglected children N=39		GEE ANOVA Group effect (p-value)	Effect size (Glass' Δ)
	M (*SD*)	Range	*M* (*SD*)	Range		
MLU (morphemes)	6.90 (1.30)	3.88-10.74	5.60 (1.13)	3.52-7.82	< .001	1.00
Number of verbal inflections	5.28 (1.28)	2-8	4.51 (1.28)	2-8	.002	0.60
Word-level errors	2.24 (2.23)	0-12	3.67 (2.81)	0-10	.059	NA
Omission errors	3.57 (3.01)	0-14	6.38 (4.14)	0-17	.006	0.93

Table 3 shows that, overall, the neglected children produced significantly fewer verbal inflections than the non-neglected children (Glass' $\Delta = .7$, $p < .001$). A detailed analysis of verb tenses shows that the neglected children produced the present indicative ($Z = 1.273$, $p = .041$, $\Delta = .53$) and the periphrastic future ($Z = 1.271$, $p = .033$, $\Delta = .4$) less often than their non-neglected peers. The results were close to the significance level for the present perfect ($Z = 1.0585$, $p = .077$) and imperfect ($Z = .975$, $p = .069$) tenses. As for verb moods, the neglected children produced the imperative significantly more often than the non-neglected children ($Z = 1.365$, $p = .013$, $\Delta = .75$).

Table 3

Comparison of the number of verbal inflections (tenses and moods) produced by neglected and non-neglected children (N=125)

	Non-neglected children N=86		Neglected children N=39		GEE ANOVA Group effect (p-value)	Effect size (Glass' Δ)
	M (*SD*)	Range	*M* (*SD*)	Range		
Tenses						
Indicative present	27.95 (7.17)	12-47	24.13 (6.62)	10-35	.041	.53
Periphrastic future	5.87 (3.54)	0-15	4.44 (3.87)	0-15	.033	.4
Present perfect	3.07 (2.17)	0-10	2.46 (2.40)	0-11	.077	NA
Imperfect	1.48 (2.75)	0-15	0.49 (.97)	0-5	.069	NA
Simple past	.20 (.57)	0-3	.10 (.38)	0-2	.586	NA
Past perfect	.15 (.62)	0-5	.05 (.22)	0-1	.553	NA
Mood						
Imperative	3.38 (2.15)	0-12	5.00 (3.85)	0-13	.013	.75
Subjunctive	1.06 (1.37)	0-5	.49 (.76)	0-3	.106	NA

Conditional	.28 (.64)	0-3	.15 (.67)	0-4	.116	NA
Present participle	.02 (.15)	0-1	0	0	.567	NA
Past participle	.01 (.11)	0-1	.08 (.35)	0-2	.229	NA
Total	43.50 (8.72)	22-61	37.38 (9.02)	17-53	< .001	.7

The first part of Table 4 shows that the number of word-level errors averaged 2.24 (*SD* = 2.23) for the non-neglected children and 3.67 (*SD* = 2.81) for the neglected children. The mean difference in the total score was not statistically significant, however it approached the significance level (*p* = .059), suggesting that, overall, neglected children may have made more errors of use than their non-neglected peers. A detailed analysis by type of word-level error showed significant differences between the two groups of children in the number of both lexical errors (*Z* = 1.294, *p* = .01, Δ = .68), that is, inaccuracy in the choice of vocabulary, and verbal or number agreement errors (*Z* = 1.027, *p* = .047, Δ = .48). The results also show a trend in the number of overgeneralization errors by group (*Z* = .542, *p* = .056).

Table 4

Comparison of the number of word-level and omission errors made by neglected and non-neglected children (N=125)

	Non-neglected children N=86		Neglected children N=39		GEE ANOVA Group effect (p-value)	Effect size (Glass' Δ)
	M (*SD*)	Range	*M* (*SD*)	Range		
Word-level errors						
Lexical	.73 (1.00)	0-4	1.41 (1.31)	0-5	.01	.68
Pronoun	.64 (1.26)	0-5	.92 (1.33)	0-5	.119	NA
Verbal or number	.45 (1.01)	0-9	.97 (1.34)	0-5	.047	.48

Gender	.29 (.72)	0-5	.36 (.63)	0-2	.529	NA
Overgeneralization	.13 (.40)	0-2	0	0	.056	NA
Total	2.24 (2.23)	0-12	3.67 (2.81)	0-10	.059	NA
Omission errors						
Personal pronoun	1.42 (1.98)	0-12	2.77 (3.0)	0-11	.023	.68
Relative pronoun (que/qui)	.65 (1.03)	0-5	.87 (1.34)	0-6	.312	NA
Word (other)	.41 (.56)	0-2	.72 (1.1)	0-5	.246	NA
Verb	.33 (.56)	0-2	.38 (0.71)	0-2	.450	NA
Article	.27 (.73)	0-5	.69 (1.13)	0-6	.005	.58
Complement	.22 (.56)	0-4	.46 (.76)	0-3	.108	NA
Verbal auxiliary	.16 (.43)	0-2	.31 (.61)	0-2	.302	NA
Preposition	.12 (.32)	0-1	.18 (.39)	0-1	.401	NA
Total	3.57 (3.01)	0-14	6.38 (4.14)	0-17	.006	0.93

The second part of Table 4 shows that the neglected children omitted significantly more words than their non-neglected peers ($Z = 1.69$, $p = .001$, $\Delta = .93$). More specifically, pronouns were the most common omission in both groups, but this error was even more frequent among the neglected children than among their non-neglected peers ($Z = 1.26$, $p = .023$, $\Delta = .68$). Articles were also omitted more often by the neglected children ($Z = 1.294$, $p = .005$, $\Delta = .58$).

Prevalence of Morphosyntactic Difficulties

The bootstraping estimate found that the 95% confidence interval of the 10th percentile of the MLU in morphemes ranged between 4.81 and 5.68. Thus, children whose MLU_m was

under 4.81 were classified in the "difficulties" subgroup, children whose MLU_m was between 4.81 and 5.68 were classified in the "intermediate" subgroup, and children whose MLU_m was above 5.68 were classified in the "TD" subgroup.

The proportion of neglected children in the "difficulties" subgroup was significantly higher than that of non-neglected children ($\chi^2_{(1, 125)} = 9.87$, $p < .01$) (Table 5). There was also a significant difference between the proportion of neglected and non-neglected children presenting TD ($\chi^2_{(1, 125)} = 11.05$, $p < .001$). No significant difference was found between the proportion of each group of children in the "intermediate" subgroup ($\chi^2_{(1, 125)} = 1.07$, $p > .05$).

The prevalence of difficulties ($\chi^2_{(1, 31)} = 1.27$, $p = .26$) and TD ($\chi^2_{(1, 31)} = 0.80$, $p = .37$) did not differ between the neglected children living under the poverty threshold and those living above it. Since poverty thus did not appear to increase the risk of presenting such difficulties among our sub-sample of neglected children, and given that poverty is highly associated with parental neglect (Brousseau, Beaudry, Simard, & Charbonneau, 2009), socio-economic status was not controlled for in our analyses.

Table 5

Proportion of neglected and non-neglected children in each subgroup (N=125)

	Non-neglected children N=86 n (%)	Neglected children N=39 n (%)	Pearson chi-square	Group effect p-value
Difficulties ($MLU_m < 4.81$)	4 (4.7)	10 (25.6)	9.87	.002
Intermediate zone (MLU_m [4.81-5.68])	10 (11.6)	8 (20.5)	1.07	.3
Typical development ($MLU_m > 5.68$)	72 (83.7)	21 (53.8)	11.05	< .001

Discussion

The aims of this study were, first, to measure the level of morphosyntactic development of a sample of neglected children and compare it to that of a sample of same-aged non-neglected peers, and second, to quantify the prevalence of morphosyntactic difficulties among these neglected children.

Overall, the neglected children showed significantly lower morphosyntactic skills than their non-neglected peers for three of the four indicators studied (MLU in morphemes, verbal inflections [tenses and moods] and omission errors, but not total number of word-level errors). For the latter indicator, the mean difference approached the significance threshold ($p = .059$), suggesting that the neglected children also tended to make more frequent word-level errors. Notably, the prevalence of morphosyntactic difficulties among the neglected children, based on the MLU_m, was more than five times (25.6%) that among the non-neglected children (4.7%). A detailed analysis of the morphosyntactic difficulties presented by the neglected children indicated a lag in morphosyntactic maturity among these children. This lag translated into a level of skills similar to that of children up to two years younger. Presenting such major clinical difficulties at age 4, a pivotal age in the development of the morphosyntactic component of language, is very alarming. Typically, the language systems that contribute to the production of longer sentences have stabilized by 4 years of age (Parisse & Maillart, 2004). This makes the difficulties identified at this age all the more worrying.

The prevalence found in our study appears lower than that reported by Sylvestre and Mérette (2010), where 41.7% of 3-year-old French-speaking neglected children presented language difficulties. To determine whether language difficulties were present, these researchers used the Rossetti Infant-Toddler Language Scale (ITLS; Rossetti, 2001), which provides an

overall measure of the level of development of the child's expressive and receptive language. It is therefore not a specific measure of morphosyntax, which makes their results difficult to compare with ours. In addition, Sylvestre and Mérette's study focused on the language development of younger children (18 to 36 months). There is great interindividual variability in the language development of children aged 3 and under. As developmental gaps are more pronounced at this age, there is a risk of overestimating the prevalence of language difficulties. On the other hand, the prevalence of difficulties quantified at age 4, when language systems have stabilized, is more reliable. This makes the magnitude of the prevalence found in our study all the more alarming.

The context of parental neglect hindering language development may explain this high prevalence. Indeed, given that neglected children are exposed to unhealthy interactions as well as language stimulation that is less well adapted to their developmental level and less complex syntactic structures compared to non-neglected children (DePanfilis 2006, Eigsti & Cicchetti 2004; Lacharité, Éthier, & Nolin, 2006), the morphosyntactic complexity of their utterances is likely to be less well developed than that of non-neglected children.

Of all the indicators of morphosyntactic development used, the neglected children's MLU_m was the most compromised. Indeed, the MLU_m of the neglected children was significantly lower than that of the non-neglected children of the same age, as shown by the effect size (Glass' $\Delta = 1$, $p < .001$). This converges with the findings of studies conducted among English-speaking neglected children at 2½ and 5 years of age (Beeghly & Cicchetti, 1994; Coster et al., 1989; Eigsti & Cicchetti, 2004). The current study allows us to go further in interpreting the morphosyntactic indicators that contribute to lowering the MLU_m of neglected children compared to that of non-neglected children.

The quantitative reduction in the length of the neglected children's utterances can be explained by the limited number of verbal inflections they produced as well as the word-level and omission errors they made. A detailed analysis of verbal inflections brought out a significant difference between the two groups of children with regard to the present indicative and periphrastic future, both of which were used less often by the neglected children. The low occurrence of future tenses among the neglected children can be explained by the lack of high-level cognitive skills required to represent and anticipate future events (Parisse & Morgenstern, 2012). Indeed, the use of this verb tense is necessary when a child must demonstrate high-level cognitive skills, such as in the formulation of hypotheses or predictions. These skills are also frequently used in various activities in the daily life of young children, for example when reading a story or participating in a group discussion. These elements reinforce the relevance of supporting the morphosyntactic skills of neglected children.

The imperative was the only verbal mood produced more often by the neglected children than by their non-neglected peers. According to the typical acquisition sequence of the language, this tense corresponds to one of the first forms mastered by young children, at approximately age 2 (Parisse & Morgenstern, 2012). Its formal simplicity partly explains this early acquisition. The fact that it refers to the here and now and performs a simple function, such as the formulation of a request, also explains its use by children in the early phases of language development. It is thus very useful for young children. The fact that neglected children still largely use it suggests that their level of language development is similar to that of much younger children.

Omission errors, which also contributed to lowering the children's MLU_m, were previously highlighted by Eigsti & Cicchetti (2004) among 5-year-old English-speaking neglected children. These researchers showed that the verbal auxiliary was often omitted by the

children in their sample. However, our results show that compound verb tenses, especially the periphrastic future, were produced less often by the neglected children than the non-neglected children in our sample. If compound verb tenses are produced less often, the risk of omitting the verbal auxiliary will also be reduced. In our study, it was the omission of the subject and determinant that stood out. These errors translate into a telegraphic style of utterances usually seen in children who are just beginning to combine words, at approximately age 2 (Thordardottir, 2005).

Lexical errors, resulting in an inappropriate choice of words, were also made very often by the neglected children. This tendency was also seen in Coster et al.'s study (1989) showing that neglected children, on average 31 months old, produced fewer different words in a spontaneous language sample than their non-neglected peers of the same age. While this type of error does not affect the MLU, it leads to inaccuracies of meaning and thus undermines the coherence of utterances. The tendency to make lexical errors can be explained by a limited vocabulary. A developed vocabulary gives children additional tools to construct complete and precise utterances (Bates & Goodman, 1999). It is therefore possible that neglected children have an insufficient expressive vocabulary to convey their message accurately. Further studies are needed to clarify the effects of the interdependence between various language components among neglected children, for example, how a better vocabulary contributes to the production of longer utterances (Devescovi, Caselli, Marchione, Pasqualetti, Reilly, & Bates, 2005).

Clinical implications

The knowledge produced by our study on the morphosyntactic skills of neglected children argues in favor of enhanced speech-language services for these children. In Quebec,

parenting groups generally represent the gateway to speech-language services in the public network. These groups aim to improve parenting skills in the area of language stimulation and parent-child interactions. However, as shown by a recent report by the National Institute of Excellence in Health and Social Services of Quebec (INESSS, 2017), speech-language services are not designed in an optimal way to reach these children. Indeed, the participation of neglectful parents in this type of activity is lower than that of non-neglectful parents (Avellar & Supplee, 2013; Poissant, 2014).

To counter the effects of this lack of attendance, language-therapy services have, in recent years, been offered to families whose child is cared for by a YC. These services are delivered by two of the 17 YCs in Quebec, namely the Quebec City and Montreal university-affiliated institutes. Nevertheless, despite this facilitating context, encouraging neglectful parents to take up the language-therapy services offered to their children remains a major challenge.

Thus, neglected children receive individualized speech-language pathology services much less often than their non-neglected peers. It is suggested that the current speech-language services, based on parenting skills, be enhanced by incorporating sustained and individual interventions based on the developmental needs of neglected children, as recommended in the context of best practices in speech-language pathology (American Speech-Language-Hearing Association, 2008). This strategy is essential to help reduce the long-term consequences of neglect on children's overall language development as well as the effectiveness of interventions.

Study limitations

Despite its many methodological strengths, this study has some limitations that should be discussed. First of all, the cross-sectional study design did not make it possible to account for the

age of onset or the evolution of morphosyntactic difficulties. Longitudinal studies in a French-speaking context are needed to address these issues. Also, despite the fact that the study design was appropriate for the stated goals, it did not allow for a better understanding of the risk factors related to parental neglect or the language skills of young neglected children. For example, the fact of whether the children lived with their biological family or a foster family was not controlled for in our study. This may have led to a confusion bias in the study of the relationship between parental neglect and the language difficulties of the children.

In addition, other components of language that were not measured in this study, including vocabulary level, may explain the quantitative reduction in the length of utterances produced by the neglected children compared to the non-neglected children. A more comprehensive study including measures of all the language skills of children would shed light on the interdependence between various language components.

Conclusion

This is the first study to provide a detailed description of the level of development of the morphosyntactic component of language among French-speaking neglected children. To our knowledge, it is also the first study to have assessed the prevalence of these difficulties in this subgroup of the population. Our results converge with those obtained by other groups of researchers who have studied the language of English-speaking neglected children between 2½ and 5 years of age, focussing on the MLU (Beeghly & Cicchetti, 1994; Coster et al., 1989; Eigsti & Cicchetti, 2004; Fox et al., 1988) and omission errors (Eigsti & Cicchetti, 2004). Our results complement these, providing more in-depth knowledge on the verbal inflections produced and types of word-level and omission errors made by French-speaking neglected children. Children's

morphosyntactic skills are involved in their overall development. In light of the portrait of morphosyntactic difficulties presented by the neglected children in this study, further research appears essential in order to fully understand the challenges of helping neglected children develop the morphosyntactic component of their language.

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