

Quality of interactions in ECE settings and mean length of utterances among 4-year-old neglected children: Results from the ELLAN Study

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Abstract

Language difficulties are frequently characterized by a significantly lower mean length of utterance (MLU) among children experiencing neglect. More opportunities to experience positive interactions, such as in early childhood education (ECE) settings, could help increase these children's MLU. This study aims to examine the relationship between the quality of interactions within the group in ECE settings attended by children experiencing neglect and the presence of difficulties based on MLU (MLU-Ds). Eighteen (18) neglected (age = 48.26 months, SD = 0.37) and 86 non-neglected children (age = 48.07 months, SD = 0.24) participated in this study. To estimate the prevalence of difficulties, the MLU of all the participants was measured using a language sample. The Classroom Assessment Scoring System Pre-K (Pianta, La Paro, & Hamre, 2008) was used to measure the quality of interactions in ECE settings attended by the children experiencing neglect. Behaviour Management ($p = .0072$, adjusted $R^2 = .47$) and Concept Development ($p = .019$, adjusted $R^2 = .15$) are associated with the MLU of the neglected children presenting MLU-Ds. Although not statistically significant, the results obtained for the dimension of Regard for Child Perspectives ($p = .090$, adjusted $R^2 = .12$) raise relevant trends to examine. This study highlights specific dimensions of quality of interactions that are associated with language skills of children experiencing neglect. It also supports the need to continue studies to have a more comprehensive portrait of this association.

Keywords: child neglect; language difficulties; early childhood education settings; quality of interactions, classroom assessment scoring system

Quality of Interactions in ECE Settings and Mean Length of Utterances Difficulties Among 4-Year-Old Neglected Children: Results from the ELLAN Study

Child neglect is defined by a parent's lack of capacity to adequately meet the basic physical, educational, emotional or health needs of his/her child, thereby compromising the child's safety, security and/or development (Quebec Official Publisher, 2020). It is the most prevalent form of maltreatment in North America among children aged 5 and under (Association of Youth Centers of Quebec, 2018; U.S. Department of Health & Human Services, 2017). In the province of Quebec (Canada), the most recent data quantify its prevalence at 9.2 children under 6 years of age per 1000 (Association of Youth Centers of Quebec, 2018).

It is recognized that the same child can be exposed in a co-occurring way to multiple forms of maltreatment (eg., neglect, physical abuse, sexual abuse, psychological maltreatment, etc.) (O'Hara et al., 2015). In Canada, nearly one in five evaluations concludes that there is more than one form of maltreatment (Government of Canada, 2012).

Growing up in a context of neglect means that children may be deprived of warm interactions with their parents from an early age. The interactions that do take place are generally infrequent and unadapted to the children's developmental needs (Di Sante, Sylvestre, Bouchard, & Leblond, 2020; Eigsti & Cicchetti, 2004). It appears that neglect alone is associated with significant consequences for language development and these are not necessarily exacerbated by the addition of other forms of maltreatment exposure (O'Hara et al., 2015). Language development in children occurs through language stimulation adjusted to their developmental level (Poll, 2011). The quantity and especially the quality of the language input produced by parents plays a determining role in language development among children (Hirsh-Pasek et al., 2015). Thus, children's language skills are greatly weakened in the context of neglect (Lum, Powell, Timms, & Snow, 2015; Sylvestre, Bussi res, & Bouchard, 2016).

In fact, language is a highly and frequently compromised sphere of development among children exposed to neglect (McDonald, Milne, Knight, & Webster, 2013; Sylvestre et al., 2016). Nearly one in two (41.7%) have significant language difficulties at age 3 (Sylvestre & Mérette, 2010). This prevalence greatly exceeds that in the general population, which stands at between 10% and 19% (e.g. Collisson et al., 2016). This points to the relevance of examining language development among children experiencing neglect, particularly in light of the dearth of studies on this issue to date (Boyce & Maholmes, 2013).

Child neglect and language development

In typical language development, vocabulary acquisition takes off significantly around the age of 18 months (Daviault, 2011). As their vocabulary increases, children have more and more tools for producing utterances. Along with the increase in vocabulary, the child refines his pronunciation skills (phonology) and becomes better at inflecting and creating new words (morphology). All of these language skills are decisive for the next milestone in language development: the combination of words (Parijsse & Maillart, 2004). Typically, two-word utterances emerge around two years old, whereas full utterances constitute a highlight of language development between the ages of 3 and 5 (Paul & Norbury, 2012; Parijsse & Maillart, 2004). Children's ability to produce complete and grammatically consistent utterances is mainly reflected in the calculation of the mean length of utterances (MLU). MLU is a frequently used indicator in the study of language development in children, including those with language difficulties (Thordardottir, 2016; Thordardottir et al., 2011).

Language difficulties can arise during the development of young children. These difficulties can be apparent in the production and processing of phonology, vocabulary and morphosyntax, as well as in pragmatics (Bishop, Snowling, Thompson, Greenhalg, &

CATALISE-2 consortium, 2017). As suggested by the *Ordre des orthophonistes et audiologistes du Québec* (Canada), the terminology "difficulties", as opposed to "delay or disorder", should be favored for children in whom clinical differences are observed but do not allow a conclusion of developmental language disorder to be drawn at the time of assessment (2018).

Previous studies involving 2½-year-old English-speaking children in a situation of neglect have shown these children to have a lower MLU ($M = 2.11$) compared to their non-neglected peers ($M = 2.77$) (e.g., Beeghly & Cicchetti, 1994). According to Brown's stages (1973) of syntactic development, MLU for 2 ½ year olds ranges from two to three morphemes. In Beeghly and Cicchetti's study (1994), children experiencing neglect are therefore in the low average, while non-neglected peers are in the upper average. A recent study of 4-year-old French-speaking children exposed to neglect found that 25.6% of these children had clinically significant language difficulties based on their MLU (Julien, Sylvestre, Bouchard, & Leblond, 2019). Overall, they displayed morphosyntactical skills similar to those of children as young as 2 (Julien et al., 2019). More specifically, their MLU, calculated in morphemes (MLU_m), appeared to be the most compromised indicator of other morphosyntactic skills, like word-omission errors or verbal inflections (Julien et al., 2019).

The calculation of the MLU_m takes into account all the lexical and grammatical manipulations produced by the child and draws an exhaustive portrait of his/her morphosyntactic skills. Morphemes are the smallest units of meaning used to form words or mark grammatical agreement. For example, the statement in French "je joue dehors" (I play outside) contains three words and four morphemes, namely the pronoun "Je" (1 morpheme), the verb "joue" conjugated in first person singular (1 morpheme) and indicative present (1 morpheme), and the adverb "dehors" (1 morpheme).

The substantial and persistent gap observed between the MLU_m of neglected children and that of non-neglected children is of great concern, given that it is associated with children's subsequent reading and writing skills, which are in turn related to their academic success (Justice, Bowles, Turnbull, & Skibbe, 2009). The ability to orally produce complete and coherent utterances is also central to children's social interactions, as it allows them to convey precise and clear ideas, promoting communication with their peers and with adults (Bouchard, Cloutier, Gravel, & Sutton, 2008).

These findings confirm the importance of identifying ways to mitigate the deleterious effects of child neglect on the language development of young children. Providing children exposed to neglect with other opportunities to enrich their language skills in a stimulating environment appears to be a winning strategy for maximizing their developmental potential (Dinehart, Manfra, Katz, & Hartman, 2012; Hahn et al., 2014). In this regard, given their educational mission, early childhood education (ECE) settings are ideally suited to meet this need (Government of Quebec, 2019). These settings expose children to positive interactions with adults and peers while providing multiple and varied learning opportunities (Hahn et al., 2014). Attending an educational setting does not minimize or replace adequate language stimulation in the family environment but is likely to improve or even compensate for it.

Language development of children experiencing neglect and ECE

Among the constituent parameters of ECE, its quality is recognized to have an influence on children's development, even more so than the type of ECE, or the duration and intensity of attendance (NICHD, 2000; Sabol, Soliday Hong, Pianta, & Burchinal, 2013). Quality of ECE can be assessed through both its structural aspects (e.g., child-per-educator ratio, number of years of experience of educator) and aspects related to the processes underlying the educational actions,

including the quality of the interactions between the educator and the children (Dowsett, Huston, Imes, & Gennetian, 2008). A meta-analysis of nearly 2,500 4½-year-old children concluded that the quality of interactions in ECE settings, measured using the Classroom Assessment Scoring System [CLASS] (Pianta, La Paro, & Hamre, 2008), was the strongest predictor of the level of language development among the children (Sabol et al., 2013). The extent to which children experiencing neglect demonstrate developmental needs with regard to language and the long-term impact of these difficulties on their academic success point to the relevance of examining the relationship between language development and the quality of interactions in ECE settings.

Despite the importance of the quality of ECE for language development, only two studies have evaluated its effects on children exposed to neglect (Dinehart et al., 2012; Kovan, Mishra, Susman-Stillman, Piescher, & LaLiberte, 2014). These studies showed that enrolment in an accredited ECE program – with accreditation based on structural and process quality criteria – was associated with better receptive and expressive vocabulary among children experiencing neglect between 3 and 4 years of age, compared to their neglected peers attending a non-accredited ECE program (Dinehart et al., 2012). However, these studies relied on an indirect measure of the quality of the structural aspects and processes characterizing the ECE settings, namely accreditation, rather than examining the quality of interactions in these settings, a strong predictive factor of language development. This limits the interpretation of the contribution of the quality of these interactions to the language development of children experiencing neglect.

Kovan et al. (2014) investigated the relationship between the overall quality of ECE settings, the majority of which were center-based, and the level of receptive vocabulary of children exposed to neglect (mean age = 55 months). These authors used Minnesota's (USA) quality rating and improvement system for childcare programs. Only ECE settings with a high-quality score (3 or 4 on a scale of 4) were included in this study. The results show that, over the

course of one year of ECE attendance, the receptive vocabulary of both the neglected children and their non-neglected peers increased significantly. However, the vocabulary of the children experiencing neglect was significantly and persistently delayed compared to that of their non-neglected peers between the beginning and end of the study. Thus, while the receptive vocabulary of the children exposed to neglect improved, it never caught up with that of their peers (Kovan et al., 2014).

Knowledge on the relationship between the quality of ECE and the level of language development among neglected young children is, to date, very limited. The two studies referred to above provide a fragmentary portrait of this relationship (Dinehart et al. 2012; Kovan et al., 2014). First, neither of these studies highlight the specific contribution of the quality of educator-child interactions, as this component was not specifically measured. However, it is precisely this component of ECE that best predicts the subsequent level of language development of young children. Moreover, the only outcome considered was vocabulary, whereas the MLU_m is known to be an accurate and robust predictor of the level of present and subsequent language development (Thordardottir et al., 2011).

Aim of the study

The overall aim of this study was to examine the relationship between the quality of interactions within the group in ECE settings and the MLU_m of the children exposed to neglect, according to whether or not they present with difficulties based on MLU (MLU-Ds). In this study, MLU-Ds refer to a lower MLU than expected in comparison to children of the same age.

Method

This cross-sectional study is part of a longitudinal study aimed at identifying the language-related, personal and environmental determinants of school preparation among children experiencing neglect (Early Longitudinal study on Language and Neglect [ELLAN]). The ELLAN study involves a total sample of 69 neglected children and 99 non-neglected children. The status of neglect was confirmed by psychosocial workers, mainly social workers and psychoeducators who provide evaluation, counselling, preventive action and rehabilitation, from four participating Youth Protection Centers (YPC), whose mission is to ensure the safety and development of maltreated children.

The data presented in this article were collected at the third measurement time of the longitudinal study, when the children were 4 years old ($M_{\text{neglected children}} = 48.26$ months, $SD = 0.37$; $M_{\text{non-neglected children}} = 48.07$ months, $SD = 0.24$). Considering that the current MLU_m norms for 4-year-old French-speaking children are derived from small samples ($n < 30$), non-neglected children were also included in this study as a comparison group for the measurement of language skills. Ethics approval was granted by the ethics ***

Participants

The present study involved 104 participants, including 86 non-neglected children (comparison group) and 18 neglected children (experimental group) (Table 1). Children with a biological condition associated with language difficulties (e.g. deafness) were excluded from the longitudinal study.

The inclusion criteria for the experimental group were: 1) to have a substantiated case for primary case of neglect or serious risk of neglect in the Youth Protection services, 2) to have been exposed to French more than 90% of the time since birth, 3) to be enrolled in a structured ECE setting for a period of at least 50 days in order to have had enough exposure to allow the

effects on language development to be observed (Logan, Piasta, Justice, Schatschneider, & Petrill, 2011). An ECE setting is considered to be structured if it involves a stable attendance schedule and organizes the children's routine around supervised activities. In this study, this referred to ECE settings governed by the ministry of Family (including non-profit childcare centres [*centres de la petite enfance*], subsidized private daycare centres, or home-based childcare services recognized by a coordinating office).

INSERT TABLE 1

Of the cohort of children experiencing neglect that participated at the third measurement time of the ELLAN study (see Figure 1), 13 were lost to follow-up, while 8 (5 families and 3 ECE managers) declined to participate in the current study. Four participants were also excluded because they did not produce the required minimum number of utterances (50), which is considered valid for measuring the morphosyntactic skills of young children (Thordardottir, 2016). Eight other participants were excluded because they did not attend a structured ECE setting. This brought the number of participants in the experimental group down to 18 children, 13 of whom attended a non-profit childcare centre, 3 a subsidized private daycare centre and 2 a home-based childcare service recognized by a coordinating office. A comparative analysis showed that the sociodemographic characteristics of the children exposed to neglect participating in this study ($n = 18$) were not significantly different, with respect to gender, family structure and poverty ($p > .05$), to those of the neglected children in the longitudinal ELLAN cohort who did not participate in the current study ($n = 33$). Risk factors associated with child neglect, including economic poverty and single parenting (Brousseau, Beaudry, Simard, & Charbonneau, 2009), are consistent with the characteristics of the current sample (see Table 1). Indeed, 72.2 % of children experiencing neglect are living in a non intact family. Almost two-thirds of them (62.5 %) are

also living under the poverty threshold. Due to the small sample size, sociodemographic data was only used to describe the sample.

INSERT FIGURE 1

Participants experiencing neglect have, on average, attended an ECE setting for 23.8 months ($SD = 10.1$). The majority (76.5%) attended their ECE setting at least 30 hours weekly. Their educators ($n = 18$, 1 male) had an average of 16.7 years ($SD = 8.5$) of experience in ECE. The educators were not aware of the child's neglected status.

For the comparison group, 86 non-neglected children were recruited from ECE settings. In order to meet the inclusion criteria for the ELLAN study, they had to have had the same level of exposure to French as the children exposed to neglect and could not have received speech-language therapy services prior to the time of entry into the main study. The comparison group is used exclusively to determine the presence of MLU-Ds within the experimental group. The calculation of the MLU within the two groups follows the same methodology.

Measures

MLU_m. To calculate the MLU_m, a sample of spontaneous language was collected during a 15-minute session of standardized, semi-structured play (*Neighbourhood Game*, Sylvestre & Morissette, 1989) in the child's home, involving the child and a research assistant. During this session, the interviewer followed a predetermined scenario to ensure that it was administered in a standardized way, allowing all children the same opportunities to talk. The toys used included a fire station, a house, a gas station, figurines (1 boy, 1 girl, 2 firemen, 1 dog), 3 cars and a fire truck. The play session was video-recorded for later analysis.

Based on the video-recordings, a transcript of 50 utterances per child, starting at the third minute of 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. If the recording did not include 50 utterances starting from the third minute, 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 then used to code the transcripts. The first author and one research assistant took the recommended SALT training program online and then coded the transcripts. The first author coded all the language samples. To verify inter-rater reliability, the research assistant also coded 30 randomly selected transcripts, representing 28% of the total sample. Inter-rater global rating agreement on the MLU_m was 98.6%. The coding differences were resolved by the first author.

Quality of interactions within the group. The quality of interactions within the group in ECE settings was measured using the CLASS Pre-K (Pianta et al., 2008), which includes ten dimensions grouped under three domains: Emotional Support [ES], Classroom Organization [CO] and Instructional Support [IS]. Figure 2 illustrates the set of domains and dimensions of the quality of interactions. CLASS Pre-K accounts for interactions between children and adult-child interactions within the group directly in the ECE settings.

INSERT FIGURE 2

The first domain, ES, refers to positive child-child and child-educator relationships, characterized by smiling, caring, and respect. It also considers the way in which the educator promotes the children's engagement in their learning and meets their needs as well as the extent to which he/she takes their ideas and interests into account. The second domain, CO, focuses on the way in which the educator prevents or redirects disturbing behaviours and maximizes the time dedicated to learning. The variety of learning methods used (e.g. visual, motor, auditory,

kinesthetic) is another dimension of this domain. The third domain, IS, refers to the presence of discussions or activities involving higher-level cognitive skills (e.g. reasoning, predicting, evaluating). The specific feedback given by the educator and the use of scaffolding techniques to promote oral language development also come under this domain.

The quality of interactions within the group is measured for four 30-minute observation cycles, for a total duration of two hours per each of the 18 ECE settings. Each cycle includes 20 minutes of observation and 10 minutes of coding. In the current study, all observations were carried out by a certified observer to ensure reliability of the coding (Pianta et al., 2008). In order to preserve the ecological nature of the observation, no particular instructions were given by the research team to the educators, who were told to plan their day as usual. The course of the observation period was therefore entirely determined by the educators, according to their typical planning. Nevertheless, contexts can influence the quality of interactions between children and between children and the educator (Torr & Pham, 2016). This point is raised in the discussion.

During the cycles of observation, a score on a Likert scale ranging from 1 to 7 is assigned to each dimension. Scores of 1 and 2 correspond to a low level of quality, 3, 4 and 5 to a medium level of quality and 6 and 7 to a high level of quality. The convergent validity of the CLASS Pre-K is considered high for the ES ($\alpha = 0.83-0.89$), CO ($\alpha = 0.77-0.89$) and IS ($\alpha = 0.83-0.85$) domains (Hamre, Pianta, Mashburn, & Downer, 2007).

The current study involved a total of 72 observation cycles (4 per each of the 18 ECE settings). Observation focused on six different interaction contexts, the most common of which were free play ($n = 20$) and large group activities ($n = 15$). The other contexts were meals and snacks ($n = 14$), daily routines ($n = 11$), outdoor games ($n = 10$) and small group activities ($n = 2$).

Socio-demographic characteristics of the child and his/her family. A socio-demographic questionnaire administered as part of the ELLAN study collected personal information about the child (e.g. birth weight, number of months of ECE attendance), and his/her family (e.g. family income, parents' level of education). The proportion of participants living below the poverty threshold was based on data for 2014, the year the socio-demographic data were collected. The poverty threshold refers to a deprivation index based on the total before-tax income available for the number of people living in the same household (Statistics Canada, 2019).

Procedures

The characteristics of the child and his/her family were collected at the first measurement time of the ELLAN study, during a 60-minute visit to the family home. These data were then updated at the third measurement time, during another home visit. At this time, a research assistant also collected the sample of spontaneous language using the *Neighbourhood Game* activity. Parents received financial compensation and the children received a gift.

At the third measurement time, the research assistant also completed a consent form with the parents, asking for permission to contact their child's educator. The latter was then contacted, informed about the current study and invited to participate. If the educator agreed to participate, an appointment was made to carry out the observation in the ECE setting according to his/her availability. The consent form was signed by the educator and the observer prior to the observation cycles. The quality of interactions within the group was observed during a single morning visit to each ECE setting.

Statistical analysis

To estimate the prevalence of MLU-Ds among the children experiencing neglect, the data on the MLU_m were analyzed using a generalized ANOVA. Visual inspection of the distributions confirmed the use of gamma distribution rather than normal distribution based on the quality of the fit indicators (SPSS 24, proc GENLIN, distribution = gamma, link = log). The rationale for using Glass's delta, as opposed to Cohen's d, is based on the fact that the standard deviations of the distributions under study are different, as it is the case in this study. Glass's delta can be interpreted as Cohen's d (Hedges, 1983).

The proportion of neglected and non-neglected children with MLU-Ds, based on the MLU_m , was calculated using the bootstrap method (Efron & Tibshirani, 1993). This method determines at 95% certainty the confidence interval (CI) of a parameter, in this case the 10th percentile. This parameter, derived from the comparison group, was used as a threshold to identify the presence of MLU-Ds among the children exposed to neglect and their non-neglected peers. The 10th percentile represents a clinical threshold frequently used by speech-language pathologists to demonstrate clinically significant difficulties (Thordardottir et al., 2011).

Three subgroups of children were formed using the bootstrap method (see Table 2): (1) those with a typical development (TD), whose MLU_m was beyond the upper bound of the 10th percentile CI (9 neglected and 72 non-neglected), (2) those in the middle zone, whose MLU_m was between the lower and upper bounds of the 10th percentile CI (3 neglected and 10 non-neglected), inclusively, and (3) those with MLU-Ds, whose MLU_m was below the lower bound of the 10th percentile CI (6 neglected and 4 non-neglected). Identifying participants belonging to the middle zone, for whom it was impossible to say with certainty whether they presented with TD or MLU-Ds, ensured that the prevalence of MLU-Ds was not overestimated. A chi-square test was then used to determine whether there were differences in the proportions of neglected and non-neglected children in each sub-group (TD, middle zone, MLU-Ds).

In order to examine whether the relationship between the quality of interactions and the MLU_m of the children experiencing neglect differed according to the presence of TD or MLU-Ds, preliminary analyses involving independent sample t-tests were conducted. This step helped to determine whether the level of quality of the interactions within the group was similar between the ECE settings of the children experiencing neglect with TD and those with MLU-Ds. Then, linear regression analysis was performed using Potthoff's technique (1966). It should be noted that this analysis excluded children in the middle zone, bringing the sample to 15 participants, 9 of whom with TD and 6 with MLU-Ds.

Potthoff's technique first calculates the slope of the regression line for each subgroup to determine whether it is statistically different from zero ($p \leq .05$), and whether the adjusted R^2 indicates an appreciable effect size. The next step examines whether the slopes are statistically different from one another. In principle, when none of the slopes are significantly different from zero, the analysis stops. In this case, however, the slope comparison was carried out given the very small samples (9 with TD and 6 with MLU-Ds). The slope equality test thus included more degrees of freedom and, consequently, more statistical power.

Results

Prevalence of MLU-Ds in the children experiencing neglect

The results confirmed that the MLU_m of this sample of children exposed to neglect was significantly lower ($M = 5.41$, $SD = 1.06$) than that of their non-neglected peers ($M = 6.90$, $SD = 1.30$) [$\chi^2_{(1, 104)} = 27.68$, $p < .001$, *Glass' Δ* = 1.15]. The bootstrap analysis showed that the 95% CI of the 10th percentile of the MLU_m was between 4.81 and 5.68. Thus, children with an MLU_m lower than 4.81 were considered to present with MLU-Ds, those with an MLU_m between 4.81 and 5.68

(included) were assigned to the middle zone, and those with an MLU_m greater than 5.68 were considered to present with TD.

Table 2 shows that the proportion of children experiencing neglect with MLU-Ds was more than seven times that of the non-neglected children, $\chi^2_{(1, 104)} = 10.98, p < .001$. The proportions of neglected and non-neglected children with TD also differed significantly, $\chi^2_{(1, 104)} = 7.97, p < .01$. The vast majority of non-neglected children present with TD (83.7%) in comparison to only half of the children exposed to neglect presenting with TD (50.0%). No difference was observed between neglected and non-neglected children in the middle zone, $\chi^2_{(1, 104)} = 0.038, p > .05$. If we withdraw children from the middle zone in the neglected and non-neglected groups, there is a significant lower risk of presenting with MLU-Ds if the child is not exposed to neglect (odds ratio [OR] = 0.083, 95% CI = 0.02-0.35). Also, the relative risk of presenting with TD is significantly higher if the child is not exposed to neglect (relative risk [RR] = 1.58, 95% CI = 1.04-2.40).

INSERT TABLE 2

Relationship between MLU_m of the children experiencing neglect and the quality of interactions

The quality of interactions within the group in ECE settings attended by this sample of children experiencing neglect is reported in Table 3. The ES domain showed a high level of quality ($M = 6.01, SD = 0.44$), the CO domain showed a medium-high level of quality ($M = 5.73, SD = 0.53$) and the IS domain showed a low level of quality ($M = 2.64, SD = 0.47$).

INSERT TABLE 3

Considering the small sample sizes for each group ($n = 9$ TD and 6 MLU-Ds), comparison of means analyzes would be largely underpowered. However, a visual analysis of the quality levels of interactions for each domain and dimension reveals an important similarity between the ECEs of children with TD and those with MLU-Ds (see means in Table 4). Potthoff's suite of

analyses tested whether the relationship between the MLU_m of the children exposed to neglect and the quality of interactions related to the various domains and dimensions of the CLASS Pre-K differed according to whether these children presented with TD or MLU-Ds. Table 4 presents the results of these analyses for the domains and dimensions of the CLASS Pre-K. Due to small sample sizes, the following statistical analyzes are intended to be exploratory in order to produce initial data concerning the relationship under study.

INSERT TABLE 4

Emotional Support. The first step of Potthoff's technique showed that the regression slopes between the MLU_m and the four dimensions of ES were not significantly different from zero, for either the children experiencing neglect with MLU-Ds or those with TD. Nevertheless, the relationship followed the expected pattern between the MLU_m of the children experiencing neglect with MLU-Ds and Regard for Child Perspectives. Although not significant ($p = .090$), this result suggests a trend that a larger sample size could validate that neglected children with MLU-Ds could benefit from high-quality of Regard for Child Perspectives, whereas it could not have any effect on the TD sub-group. Figure 3 illustrates the comparison of regression slopes by subgroup (TD and MLU-Ds).

INSERT FIGURE 3

Classroom Organization. The first step of Potthoff's technique revealed that there was no significant relationship between the MLU_m of the children experiencing neglect with TD or MLU-Ds and Productivity or Instructional Learning Formats. However, the regression slope associated with Behaviour Management was marginally different from zero for the children experiencing neglect with MLU-Ds ($p = .079$). The second step of Potthoff's technique showed that the regression slopes differed significantly from one another for this same dimension ($p = .0072$). More specifically, a moderately positive relationship (adjusted $R^2 = .47$) was found

between the MLU_m of the children exposed to neglect with MLU-Ds and Behaviour Management, whereas this relationship was not significant for those with TD. Thus, the quality of interactions related to Behaviour Management in the group tended to have a different influence on the MLU_m of the children, depending on whether they presented with TD or MLU-Ds.

Instructional Support. The first step of Potthoff's technique revealed that the regression slopes were not different from zero, for either the children experiencing neglect with TD or those with MLU-Ds, for the three dimensions of Instructional Support (IS). However, the results show that the slopes for these two subgroups significantly differed for the Concept Development dimension ($p = .019$). Since the slope coefficients associated with the subgroup of children experiencing neglect with MLU-Ds are negative ($CD = -.23$), the result suggests a negative relationship between the MLU_m of the children exposed to neglect with MLU-Ds and the quality of Concept Development.

Discussion

The goals of this study were, first, to establish the prevalence of MLU-Ds in a group of 4-year-old French-speaking children experiencing neglect, based on the MLU_m and, second, to examine the relationship between their MLU_m and the quality of interactions within the group in ECE settings according to the presence or absence of MLU-Ds.

Prevalence of MLU-Ds in the children experiencing neglect. The prevalence of MLU-Ds among our sample of children exposed to neglect (33.3%) was more than seven times higher than that among the non-neglected children (4.7%), which is an alarming gap. It should be recalled that in the present study, the presence of MLU-Ds is established as a function of the MLU_m of the participants. It is recognized that when the MLU_m falls below developmental expectations between the ages of 4½ and 6 years, there is a higher risk that a speech-language

therapist diagnoses a developmental language disorder (Thordardottir et al., 2011). The fact that MLU-Ds are so common among children experiencing neglect is therefore very worrying with regard to their further language development.

The context of child neglect hindering language development may explain this high prevalence. Indeed, considering that children exposed to neglect are exposed to less well adapted language stimulation as well as less complex syntactic structures compared to non-neglected children (Eigsti & Cicchetti 2004), the enrichment of the morphosyntactic complexity of their utterances may be diminished compared to non-neglected children.

Quality of interactions and the MLU_m. The results show that no domain of the quality of interactions within the group, measured using CLASS Pre-K, was associated with the MLU_m of the children experiencing neglect with TD. This can be explained by the fact that the language skills that contribute to lengthening utterances are already consolidated by the age of 4 in children with typical language development (Parisse & Maillart, 2004). In fact, at this age, the extent of vocabulary, phonological skills and the diversity of grammatical manipulations, such as verbal inflections, are sufficiently developed that the child's utterances are comparable to those produced by adults (Parisse & Maillart, 2004). Thus, since the MLU_m of the children exposed to neglect with TD was consistent with developmental expectations, it can be assumed that adult support, through high quality interactions within the group in an ECE setting, may no longer have exerted a significant influence on their MLU_m. On the other hand, it is also possible to assume that no relationship was observed between the MLU_m of these children experiencing neglect with TD and the quality of interactions related to IS because of the low scores obtained in all three dimensions of this domain.

It seems that the quality of interactions exerts a differentiated effect on children experiencing neglect with MLU-Ds. First, a non-significant positive trend emerged between the

MLU_m of the children exposed to neglect with MLU-Ds and Regard for Child Perspectives, a dimension within the domain of ES. This result suggests that in a small sample of children exposed to neglect, the MLU_m of those with MLU-Ds tended to be higher in the presence of an educator who encouraged the children to participate, demonstrated flexibility in planning, took the children's ideas into account and allowed them to express themselves freely.

This trend is in line with the findings of other studies showing child-initiated conversations to be associated with greater vocabulary size, a higher number of word combinations and more frequent exchanges with peers and adults (eg. Cabell, Justice, McGinty, DeCoster, & Forston, 2015). When the children's point of view is taken into account, such as in choosing an activity or a topic of conversation, this creates a communication context that is meaningful to them, providing greater opportunities for them to speak or pay attention to sentences produced by peers and educators (Cabell et al., 2015). The children are exposed to a variety of syntactic structures and grammatical manipulations, to which they tend to pay more attention since the activity is of interest to them. This thus points to the importance of taking the children's perspective into account when it comes to enhancing not only their morphosyntactic skills, but their overall language development.

The exploratory analysis also suggested that the higher the quality of interactions related to Behaviour Management, the higher the MLU_m of the children experiencing neglect with MLU-Ds. It is possible that when an educator expresses his/her expectations of the children, anticipates disturbing behaviours and highlights positive behaviours (eg., helping out a friend, sharing material), children then know what is expected of them and what they should focus on (Pianta et al., 2008). This context increases positive and appropriate behaviors in young children, which allows them to be more receptive to learning opportunities and to exchanging with peers and adults (Dobbs-Oates, Kaderavek, Guo, & Justice, 2011). The Behavior Management dimension

had previously been identified as significantly associated with the emergent literacy skills of preschool children, but not with language development (receptive vocabulary; Dobbes-Oates et al., 2011).

Being exposed to higher quality interactions related to Concept Development appeared to have the opposite effect. More precisely, it was observed that higher levels of quality for this dimension of the CLASS Pre-K was associated with a lower MLU_m among the children exposed to neglect with MLU -Ds. This implies that the morphosyntactic skills of these children were lower in a context where the educator is scaffolding higher-level of cognitive skills (e.g. reasoning) or making connections with the child's previous experiences. These results appear counterintuitive.

It is important to highlight the low level of quality observed for the dimension of Concept Development (1.99), which may reflect a lack of learning opportunities in our sample of ECE settings attended by children exposed to neglect. The number and quality of learning opportunities provided is crucial for language development (Poll, 2011). The minimal level of quality in the IS domain (3.25/7) required to observe gains in language skills among young children (Burchinal et al., 2016) was achieved in only two of the eighteen ECEs included in this study. This result may explain, at least in part, why there was no positive relationship between the quality of interactions related to these dimensions of IS and the MLU_m of the children experiencing neglect with MLU -Ds.

Beyond the minimum threshold, it is relevant to ponder the negative relationship between the quality of interactions related to the dimensions of IS and the MLU_m of the children exposed to neglect with MLU -Ds. First, are the scaffolding strategies measured under the Concept Development dimension intended for these children? It has been documented that the use of language support strategies is more common among children presenting typically developing

language skills than among those with difficulties (Cabell & Downer, 2011). Despite this use of support strategies, if they are not intended for children experiencing neglect with MLU-Ds, the MLU_m of the latter will not benefit from them. Moreover, the specific use of these strategies with individual children is not reflected when the quality of interactions is measured using the CLASS Pre-K.

Second, are these strategies adjusted to the developmental level of children exposed to neglect with MLU-Ds? Researchers have suggested that 4-year-old French-speaking children experiencing neglect show a level of morphosyntactic skills comparable to that of children as young as age 2 (Julien et al., 2019). The use of scaffolding strategies, for example, that elicit higher-level language skills (e.g. reasoning, planning an action, making connections with previous learning) can be adapted to the group as a whole, but possibly not to the level of development of a neglected child with MLU-Ds more specifically. This thus suggests that a level of stimulation that was too high for the language level of the children experiencing neglect in our sample may have had a negative effect on the MLU_m of these children.

Limitations and strengths of the study

Despite the significant contribution of this exploratory study in scientific and clinical terms, some limitations should be discussed. First, this study involved a small sample of children exposed to neglect, which has the effect of decreasing its statistical power. Most of the results are not significant after adjusting for family-wise error rate. A larger sample might validate the trends observed, particularly in relation to the Regard for Child Perspectives and Concept Development dimensions. Considering that the recruitment and attrition of this population constitute major challenges for research (Bartlett, Kotake, Fauth, & Easterbrooks, 2017; Kinard, 2001), this article contributes significantly by providing a first glimpse into the relationships examined.

Furthermore, significant results emerge despite the small sample of the current study, which are likely to remain significant in context of a larger sample. A larger sample could also confirm the statistical trends observed in this study, or even identify others in the associations between MLU and dimensions of quality of interactions.

Second, almost half of the contexts in which the quality of interactions was observed involved large group activities or outdoor play (35/72). These contexts are considered less conducive to supporting language skills than small group contexts wherein verbal exchanges are more common (Torr & Pham, 2016). In large group activities, the educator speaks to several children at a time, and topics often relate to the "here and now," which restricts, for example, the kind of back-and-forth conversation with individual children or the use of past or future verb tenses that can help increase children's MLU_m . These exchanges are therefore less likely to increase the children's MLU_m because the children are not personally engaged in a conversation (Torr & Pham, 2016). In small group activities, it is easier for the educator to engage in multiple loops of conversation, provide feedback tailored to each child's level of development, and add information to the children's utterances, thereby enriching their language skills (Torr & Pham, 2016). Studying the quality of interactions in various observation contexts could help explore the hypothesis that the quality of IS is higher in small groups, and determine whether this proves to be beneficial for the MLU_m of children exposed to neglect.

Thirdly, economic poverty is a common risk factor for families experiencing neglect (Brousseau et al., 2009). Considering this, it would be difficult to study the language skills of children experiencing neglect by isolating such socioeconomic status (SES) conditions, because the sample under study would no longer be representative of the children and families under study. It would have been possible to choose a comparison group composed of families sharing similar low SES. In the current study, the comparison group is used exclusively to determine the

presence of MLU-Ds within the experimental group. Some research studies (e.g. Fox, Long, & Langlois, 1988) have been conducted with such samples and concluded that the language skills of neglected children are compromised over-and-above those of non-neglected children from similar socioeconomic backgrounds.

Finally, the CLASS Pre-K was used to observe the quality of interactions within the group, which presents limitations in terms of studying the distinctive practices of educators with regard to providing language stimulation for a specific child (Burchinal et al., 2016). Indeed, it does not reflect the quality of language support provided to an individual level rather than a room level. More specific measures would be needed to better understand the relationship between the support of language development among children experiencing neglect and their MLU_m . To address this limitation, a study of language stimulation techniques used with each child, such as reformulating, asking questions and producing extensions, should be considered (Burchinal et al., 2016). It is well documented that these techniques help lengthen young children's utterances (e.g. Roberts & Kaiser, 2011). Furthermore, it is recognized that parent-child interactions are highly influential in the language development of young children (Hirsh-Pasek et al., 2015). Thus, a measurement of the quality of these interactions would make it possible to link more precisely with the child's language difficulties.

Clinical implications

This study suggests that the relationship between the MLU of children exposed to neglect and the quality of interactions within the group varies depending on the presence or absence of MLU-Ds. The trends observed in this study suggest that neglected children with MLU-Ds would benefit particularly from an ECE setting characterized by high quality interactions within the group for the ES domain. Moreover, quality related to the dimensions of IS is likely to be

negatively associated with these children's language skills. These findings, added to the fact that these children have been exposed to great adversity from an early age, underline the importance of high quality ECE settings developed precisely to better understand and meet all their developmental needs, including in the area of language skills (Kovan et al., 2014, Merritt & Klein, 2015). ECE settings are currently designed to support the overall development of all children. This acknowledges the importance of recognizing and encouraging ongoing collaboration between speech-language pathologists and nonclinicians, such as early childhood educators (National Institute of Excellence in Health and Social Services of Quebec [NIEHSS], 2017). This close collaboration is reflected in the intervention offered by the educator, who receives support and supervision from a professional. The interventions carried out by the educator therefore aim to supporting communication and language development for all children, as well as more targeted services for clients at risk of language difficulties (NIEHSS, 2017), such as children experiencing neglect.

In addition to the educational activities carried out daily by the educator in ECE settings, the great language needs of these children highlighted in this study justify the importance and the relevance of speech-language pathologists in youth protection services. However, children exposed to neglect remain poorly served by the health and social services network. We recognize that economic poverty is a high prevalence risk factor for families experiencing neglect, as are many other risk factors such as low education or poor social support (Brousseau et al., 2009). This comorbidity, coupled with the many risk factors present in child neglect situations, poses challenges in identifying the best methods to reach these families. It is essential that these services be improved and focus on enhancing resources around families experiencing neglect by involving multiple agencies (e.g., early childhood education services, child protection services)

and delivering interventions in the living environments, for example (Vézina, Sylvestre, Beaulieu, & Déry, 2017).

Although the professional development of educators was not the subject of this study, the associations observed tend to encourage the opportunities for collaboration between educators and speech-language pathologists. For example, a meta-analysis recently demonstrated that professional development of educators, which can be supported by speech-language pathologists, enhanced language-related educational practices (Markussen-Brown, Juhl, Piasta, Bleses, Højen, & Justice, 2017). In order for this improvement to be reflected in children's language skills, efforts devoted to professional development must be on-going and regular (Markussen-Brown et al., 2017).

Conclusion

The prevalence of MLU-Ds among the children exposed to neglect in this study is of extreme concern, being up to seven times higher than that among the non-neglected children. This study also took an innovative look at the relationship between the MLU_m of children experiencing neglect – a valid indicator of highly disrupted language development in these children – and the quality of interactions within the group in ECE settings. The many suggested associations observed between the MLU_m and the level of quality of the interactions suggest that further studies are needed to deepen our understanding of this relationship.

References

- Association of Youth Centers of Quebec. (2018). *La cause des enfants tatouée sur le coeur* [The cause of children tattooed on the heart]. Retrieved from https://www.cisss-at.gouv.qc.ca/wp-content/uploads/2018/10/2018_Bilan_DPJ.pdf
- Bartlett, J. D., Kotake, C., Fauth, R., & Easterbrooks, M. A. (2017). Intergenerational transmission of child abuse and neglect: Do maltreatment type, perpetrator, and substantiation status matter? *Child Abuse & Neglect*, 63, 84-94.
<https://doi.org/10.1016/j.chiabu.2016.11.021>
- Beeghly, M. & Cicchetti, D. (1994). Child maltreatment, attachment, and the self system: Emergence of an internal state lexicon in toddlers at high social risk. *Development and Psychopathology*, 6, 5-30.
- Bishop, D. V. M., Snowling, M. J., Thompson, P. A., Greenhalg, T., & CATALISE-2 consortium (2017). Phase 2 of CATALISE: a multinational and multidisciplinary Delphi consensus study of problems with language development: Terminology. *The Journal of Child Psychology and Psychiatry*, 58(10), 1068-1080. <https://doi.org/10.1111/jcpp.1272>
- Bouchard, C., Cloutier, R., Gravel, F., & Sutton, A. (2008). The role of language skills in perceived prosociality in kindergarten boys and girls. *European Journal of Developmental Psychology*, 5(3), 338-357. <https://doi.org/10.1080/17405620600823744>
- Boyce, C. A., & Maholmes, V. (2013). Attention to the neglected: prospects for research on child neglect for the next decade. *Child Maltreatment*, 18(1), 65-68.
<https://doi.org/10.1177/1077559513480426>

- Brousseau, M., M. Beaudry, M. Simard et C. Charbonneau (2009). *Le « Projet famille » en contexte de négligence : Développement et expérimentation d'une intervention familiale*. Québec : Centre jeunesse de Québec – Institut universitaire.
- Brown, R. (1973). *A first language: The early stages*. London: George Allen & Unwin.
- Burchinal, M., Xue, Y., Auger, A., Tien, H., Mashburn, A., ... Tarullo, L. (2016). III. Testing for quality thresholds and features in early care and education. *Quality Thresholds, Features, and Dosage in Early Care and Education: Secondary Data Analyses of Child Outcomes*, 81(2), 46-63. <https://doi.org/10.1111/mono.12238>
- Cabell, S.Q. & Downer, J.T. (2011). Improving Preschoolers' Language and Literacy Skills Through Web-Mediated Professional Development. *Professional Development*, 14(4), 316-322. <https://doi.org/10.1080/15240754.2011.613130>
- Cabell, S. Q., Justice, L. M., McGinty, A. S., DeCoster, J., & Forston, L. D. (2015). Teacher–child conversations in preschool classrooms: Contributions to children's vocabulary development. *Early Childhood Research Quarterly*, 30(A), 80-92. <https://doi.org/10.1016/j.ecresq.2014.09.004>
- Collisson, B. A., Graham, S. A., Preston, J. L., Rose, M. S., McDonald, S., & Tough, S. (2016). Risk and Protective Factors for Late Talking: An Epidemiologic Investigation. *Journal of Pediatrics*, 172, 168-174 e161. <https://doi.org/10.1016/j.jpeds.2016.02.020>
- Daviault, D. (2011). *L'émergence et le développement du langage chez l'enfant* [The emergence and development of language in children]. Montreal : Cheneliere.
- Di Sante, M., Sylvestre, A., Bouchard, C., & Leblond, J. (2020). Parental behaviors associated with the level of pragmatic language ability among 42-month-old neglected children. *Child Abuse and Neglect*, 104. doi: 10.1016/j.chiabu.2020.104482

- Dinehart, L. H., Manfra, L., Katz, L. F., & Hartman, S. C. (2012). Associations between center-based care accreditation status and the early educational outcomes of children in the child welfare system. *Children and Youth Services Review*, 34(5), 1072-1080.
<https://doi.org/10.1016/j.childyouth.2012.02.012>
- Dobbs-Oates, J., Kaderavek, J. N., Guo, Y., & Justice, L. M. (2011). Effective behavior management in preschool classrooms and children's task orientation: Enhancing emergent literacy and language development. *Early Childhood Research Quarterly*, 26(4), 420–429. <https://doi-org.acces.bibl.ulaval.ca/10.1016/j.ecresq.2011.02.003>
- Dowsett, C. J., Huston, A. C., Imes, A. E., & Gennetian, L. (2008). Structural and process features in three types of child care for children from high and low income families. *Early Childhood Research Quarterly*, 23(1), 69-93. <https://doi.org/10.1016/j.ecresq.2007.06.003>
- Efron, B. & Tibshirani, R.J. (1993). *An introduction to the bootstrap*. New York: Chapman and Hall.
- Eigsti, I.-M. & Cicchetti, D. (2004). The impact of child maltreatment on expressive syntax at 60 months. *Developmental Science*, 7(1), 88-102.
- Fox, L., Long, S.H., & Langlois, A. (1988). Patterns of language comprehension deficit in abused and neglected children. *Journal of Speech and Hearing Disorders*, 53, 239-244
- Government of Canada. (2012, July). *Child Maltreatment in Canada*.
<https://www.canada.ca/en/public-health/services/health-promotion/stop-family-violence/prevention-resource-centre/children/child-maltreatment-canada.html#End>
- Government of Quebec. (2019, September). *Accueillir la petite enfance: programme éducatif pour les services de garde du Québec* (publication n° 9782550838609).
https://www.mfa.gouv.qc.ca/fr/publication/Documents/programme_educatif.pdf

- Hahn, R.A., Rammohan, V., Truman, B.I., Milstein, B., Johnson, R.L., ... & Abraido-Lanza, A.F. (2014). Effects of Full-Day Kindergarten on the Long-Term Health Prospects of Children in Low-Income and Racial/Ethnic-Minority Populations: A Community Guide Systematic Review. *American Journal of Preventive Medicine*, 46(3), 312-323.
<https://doi.org/10.1016/j.amepre.2013.12.003>
- Hamre, B. K., Pianta, R., Mashburn, A. J., & Downer, J. (2007). Building a Science of Classrooms: Application of the CLASS Framework in over 4,000 U.S. Early Childhood and Elementary Classrooms. *Foundation for Child Development*, 30, 3-35.
- Hedges, L.V. & Olkin, I. (1983). Regression models in research synthesis. *American Statistician*, 37, 137-140.
- Hirsh-Pasek, K., Adamson, L. B., Bakeman, R., Owen, M. T., Golinkoff, R. M., Pace, A., . . . Suma, K. (2015). The Contribution of Early Communication Quality to Low-Income Children's Language Success. *Psychological Science*, 26(7), 1071-1083.
<https://doi.org/10.1177/0956797615581493>
- Julien, C., Sylvestre, A., Bouchard, C., & Leblond, J. (2019). Morphosyntactic development and severe parental neglect in 4-year-old French-speaking children: ELLAN study. *Child Maltreatment*, 24(3), 254-264.
- Justice, L.M., Bowles, R.P., Turnbull, K.L.P., & Skibbe, L.E. (2009). School readiness among children with varying histories of language difficulties. *Developmental Psychology*, 45(2), 460-476.
- Kinard, E. M. (2001). Recruiting participants for child abuse research: what does it take? *Journal of Family Violence*, 16(3), 219-236. <https://doi.org/10.1023/A:1011170914965>
- Kovan, N., Mishra, S., Susman-Stillman, A., Piescher, K. N., & LaLiberte, T. (2014). Differences in the early care and education needs of young children involved in child protection.

- Children and Youth Services Review*, 46, 139-145.
<https://doi.org/10.1016/j.chilyouth.2014.07.017>
- Logan, J. A. R., Piasta, S. B., Justice, L. M., Schatschneider, C., & Petrill, S. (2011). Children's Attendance Rates and Quality of Teacher-Child Interactions in At-Risk Preschool Classrooms: Contribution to Children's Expressive Language Growth. *Child & Youth Care Forum*, 40(6), 457-477. <https://doi.org/10.1007/s10566-011-9142-x>
- Lum, J., Powell, M., Timms, L. & Snow, P. (2015). A meta-analysis of case-control studies investigating language in maltreated children. *Journal of Speech, Language and Hearing Research*, 58, 961-976. https://doi.org/10.1044/2015_JSLHR-L-14-0056
- Markussen-Brown, J., Juhl, C. B., Piasta, S. B., Bleses, D., Højen, A., & Justice, L. M. (2017). The effects of language- and literacy-focused professional development on early educators and children: A best-evidence meta-analysis. *Early Childhood Research Quarterly*, 38, 97–115. <https://doi.org/10.1016/j.ecresq.2016.07.002>
- McDonald, J. L., Milne, S., Knight, J., & Webster, V. (2013). Developmental and behavioural characteristics of children enrolled in a child protection pre-school. *Journal of Paediatrics and Child Health*, 49(2), E142-146. <https://doi.org/10.1111/jpc.12029>
- Merritt, D. H., & Klein, S. (2015). Do early care and education services improve language development for maltreated children? Evidence from a national child welfare sample. *Child Abuse and Neglect*, 39, 185-196. <https://doi.org/10.1016/j.chiabu.2014.10.011>
- Miller, J. F. (2012). Systematic Analysis of Language Transcripts [Software]. Retrieved from <http://www.saltsoftware.com>
- NICHD Early Child Care Research Network. (2000). The Relation of Child Care to Cognitive and Language Development. *Child Development*, 71(4), 960-980.

- National Institute of Excellence in Health and Social Services of Quebec. (2017). *Organization of the continuum and provision of services to children aged 2 to 9 years with specific language impairment*. Retrieved from https://www.inesss.qc.ca/fileadmin/doc/INESSS/Rapports/ServicesSociaux/Trouble_dev_langue_AVIS.pdf
- O'Hara, M., Legano, L., Homel, P., Walker-Descartes, I., Rojas, M., & Laraque, D. (2015). Children neglected: Where cumulative risk theory fails. *Child Abuse and Neglect*, 45, 1-8. <https://doi.org/10.1016/j.chiabu.2015.03.007>
- Ordre des orthophonistes et audiologistes du Québec. (2018). *Le trouble développemental du langage : Pour les professionnels de la santé et de l'éducation*. [Developmental language disorder : For health and education professionals] https://www.ooaq.qc.ca/media/a4qnqckc/ooaq_depliant_tdl_professionnels_pour-web_-oct2018.pdf
- Parisse, C., & Maillart, C. (2004). Développement morphosyntaxique des enfants ayant des troubles de développement du langage : des données francophones [Morphosyntactic development among children with developmental language disorder : data for French]. *Enfance*, 56(1), 21-35.
- Paul, R. & Norbury, C.F. (2012). *Language Disorders from Infancy through Adolescence: Listening, Speaking, Reading, Writing and Communicating* (4th edition). Saint-Louis, MO : Elsevier
- Pianta, R. C., La Paro, K. M. et Hamre, B. K. (2008). *Classroom Assessment Scoring System (Pre-K)*. Baltimore, MD: Paul H. Brookes Publishing co.

Poll, G. H. (2011). Increasing the Odds: Applying Emergentist Theory in Language Intervention.

Language, Speech, and Hearing Services in Schools, 42, 580-591.

<https://doi.org/10.1044/0161-1461>

Potthoff, R.F. (1966). *Statistical aspects of the problem of biases in psychological tests*. Chapel

Hill, NC: University of North Carolina at Chapel Hill, Department of Statistics.

Roberts, M. Y. & Kaiser, A. P. (2011). The Effectiveness of Parent-Implemented Language

Interventions: A Meta-Analysis. *American Journal of Speech-Language Pathology*, 20,

180-199. [https://doi.org/10.1044/1058-0360\(2011/10-0055\)](https://doi.org/10.1044/1058-0360(2011/10-0055))

Sabol, T. J., Hong, S. L. S., Pianta, R., & Burchinal, M. (2013). Can Rating Pre-K Programs

Predict Children's Learning? *Science*, 341, 845-846.

Statistics Canada. (2019, November 15th). *Enquête canadienne sur le revenu 2012-2017*

[Canadian Income Survey 2012-2017]. Adapted by Institut de la statistique du Québec.

[https://www.stat.gouv.qc.ca/statistiques/conditions-vie-societe/revenu/faible-](https://www.stat.gouv.qc.ca/statistiques/conditions-vie-societe/revenu/faible-revenu/mod1_hh_1_6_6_0_.htm)

[revenu/mod1_hh_1_6_6_0_.htm](https://www.stat.gouv.qc.ca/statistiques/conditions-vie-societe/revenu/faible-revenu/mod1_hh_1_6_6_0_.htm)

Sylvestre, A., Bussi res,  .-L., & Bouchard, C. (2016). Language Problems Among Abused and

Neglected Children. *Child Maltreatment*, 21(1), 47-58.

<https://doi.org/10.1177/1077559515616703>

Sylvestre, A., & M rette, C. (2010). Language delay in severely neglected children: A cumulative

or specific effect of risk factors? *Child Abuse & Neglect*, 34(6), 414-428.

<https://doi.org/10.1016/j.chiabu.2009.10.003>

Sylvestre, A. & Morissette, A. (1989). Jeu de Village :  valuation des intentions de

communication chez les enfants d' ge pr scolaire [Neighbourhood Game: measuring

Communicative intents in preschool-aged children]. Unpublished document.

- Thordardottir, E. T. (2005). Early lexical and syntactic development in Quebec French and English: implications for cross-linguistic and bilingual assessment. *International Journal of Language & Communication Disorders*, 40(3), 243-278.
<https://doi.org/10.1080/13682820410001729655>
- Thordardottir, E. T. (2016). Long versus short language samples: A clinical procedure for French language assessment. *Canadian Journal of Speech-Language Pathology and Audiology*, 40(3), 176-197.
- Thordardottir, E. T., Kehayia, E., Mazer, B., Lessard, N., Majnemer, A., ... , Chilingaryan, G. (2011). Sensitivity and specificity of French language and processing measures for the identification of primary language impairment at age 5. *Journal of Speech, Language and Hearing Research*, 54, 580-597. [https://doi.org/10.1044/1092-4388\(2010/09-0196\)](https://doi.org/10.1044/1092-4388(2010/09-0196))
- Torr, J. & Pham, L. (2016). Educator talk in long day care nurseries: How context shapes meaning. *Early Childhood Education Journal*, 44, 245-254.
<https://doi.org/10.1007/s10643-015-0705-6>
- U.S. Department of Health & Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau. (2017). *Child Maltreatment 2015*. Retrieved from <http://www.acf.hhs.gov/programs/cb/research-data-technology/statistics-research/child-maltreatment>.
- Vézina, M., Sylvestre, A., Beaulieu, K., & Déry, É. (2017). *Un système de services et de soutien intégrés en orthophonie pour des enfants issus de familles vulnérables : expérimentation et mesure des effets* [Integrated speech-language services for vulnerable children : pilot study and impact measure]. Québec, Québec : Université Laval.

Table 1*Sociodemographic characteristics (N=104)*

	Neglected children % (N)	Non-neglected children % (N)	Pearson's chi-square	p-value
Gender (male)	77.8 (14/18)	48.8 (42/86)	3.92	.048
Non-intact family	72.2 (13/18)	9.5 (8/84)	31.91	< .001
Living under poverty threshold (Québec, 2014)	62.5 (10/16)	2.4 (2/83)	40.01	< .001

Table 2*Comparison of the prevalence of MLU-Ds in neglected and non-neglected children (N=104)*

	Neglected children % (N)	Non-neglected children % (N)	Pearson chi-square	p-value
Difficulties (MLU _{morphemes} < 4.81)	33.3 (6/18)	4.7 (4/86)	10.98	< .001
Middle zone (MLU _{morphemes} [4.81-5.68])	16.7 (3/18)	11.6 (10/86)	0.04	.85
Typical development (MLU _{morphemes} > 5.68)	50.0 (9/18)	83.7 (72/86)	10.98	.0048

Note. MLU-D = difficulties based on mean length of utterances**Table 3***Level of quality of interactions in ECE settings attended by neglected children (N=18)*

Domains and dimensions	M (SD)	Range
Emotional Support	6.01 (.44)	4.81-6.75
Positive Climate	5.96 (.61)	4.50-6.75
Negative Climate	1.61 (.71)	1.00-3.25
Teacher Sensitivity	5.94 (.61)	4.50-7.00
Regard for Child Perspectives	5.74 (.60)	4.75-6.75
Classroom Organization	5.73 (.53)	4.17-6.50
Behaviour Management	5.71 (.83)	4.00-7.00
Productivity	6.38 (.58)	4.50-7.00
Instructional Learning Formats	5.11 (.64)	4.00-6.25
Instructional Support	2.64 (.47)	1.58-3.33
Concept Development	1.99 (.58)	1.00-3.25
Quality of Feedback	2.85 (.53)	2.00-4.00
Language Modeling	3.10 (.67)	1.75-4.25

Table 4

Summary of analysis between MLU_m of neglected children and dimensions of quality of interactions in ECE settings performed with Potthoff's technique (N=15)

Domains and dimensions		MLU-D (N=6)	TD (N=9)
Emotional Support			
Positive Climate	Mean	6.04	6.08
	Slope	.28	-.18
	p (slope $\neq 0$)	.69	.30
	Adjusted R^2	-.19	.030
	p (MLU-D's slope \neq TD)	.38	
	Adjusted R^2 MLU-D / Adjusted R^2 TD	-6.33	
Negative Climate	Mean	1.42	1.72
	Slope	-.54	.16
	p (slope $\neq 0$)	.30	.15
	Adjusted R^2	.073	.16
	p (MLU-D's slope \neq TD)	.41	
	Adjusted R^2 MLU-D / Adjusted R^2 TD	.45	
Teacher Sensitivity	Mean	5.96	6.12
	Slope	.52	.35
	p (slope $\neq 0$)	.14	.22
	Adjusted R^2	.33	.091
	p (MLU-D's slope \neq TD)	.64	
	Adjusted R^2 MLU-D / Adjusted R^2 TD	3.60	
Regard for Child Perspectives	Mean	5.88	5.72
	Slope	.51	.0023
	p (slope $\neq 0$)	.26	.99
	Adjusted R^2	.12	-.14
	p (MLU-D's slope \neq TD)	.090	
	Adjusted R^2 MLU-D / Adjusted R^2 TD	-.85	
Classroom Organization			
Behaviour Management	Mean	5.96	5.58
	Slope	.75	-.15
	p (slope $\neq 0$)	.079	.18
	Adjusted R^2	.47	.14
	p (MLU-D's slope \neq TD)	.0072	

	Adjusted R ² MLU-D / Adjusted R ² TD	3.43	
Productivity	Mean	6.38	6.53
	Slope	.15	.26
	<i>p</i> (slope ≠ 0)	.87	.24
	Adjusted R ²	-.24	.074
	<i>p</i> (MLU-D's slope ≠ TD)	.87	
	Adjusted R ² MLU-D / Adjusted R ² TD	-3.24	
Instructional Learning Formats	Mean	5.29	5.11
	Slope	.22	-.068
	<i>p</i> (slope ≠ 0)	.57	.67
	Adjusted R ²	-.14	-.11
	<i>p</i> (MLU-D's slope ≠ TD)	.43	
	Adjusted R ² MLU-D / Adjusted R ² TD	1.28	
Instructional Support			
Concept Development	Mean	2.00	2.11
	Slope	-.23	.16
	<i>p</i> (slope ≠ 0)	.58	.39
	Adjusted R ²	-.15	-.019
	<i>p</i> (MLU-D's slope ≠ TD)	.019	
	Adjusted R ² MLU-D / Adjusted R ² TD	7.90	
Quality of Feedback	Mean	2.86	2.92
	Slope	-.50	-.030
	<i>p</i> (slope ≠ 0)	.56	.85
	Adjusted R ²	-.14	-.14
	<i>p</i> (MLU-D's slope ≠ TD)	.077	
	Adjusted R ² MLU-D / Adjusted R ² TD	.99	
Language Modeling	Mean	3.29	3.11
	Slope	.71	.17
	<i>p</i> (slope ≠ 0)	.10	.23
	Adjusted R ²	.41	.086
	<i>p</i> (MLU-D's slope ≠ TD)	.17	
	Adjusted R ² MLU-D / Adjusted R ² TD	4.73	

Note. MLU-D = difficulties based on mean length of utterances, TD = typical development

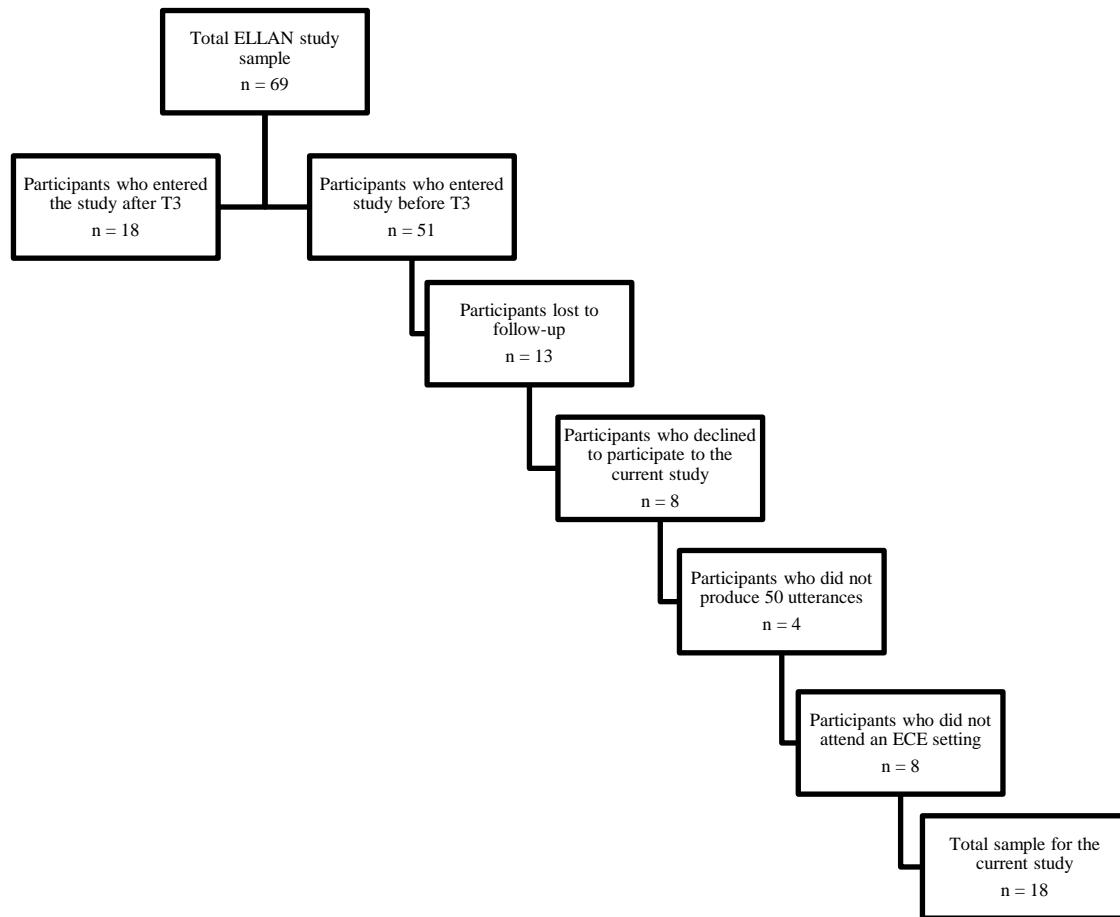


Figure 1. Participants flow chart

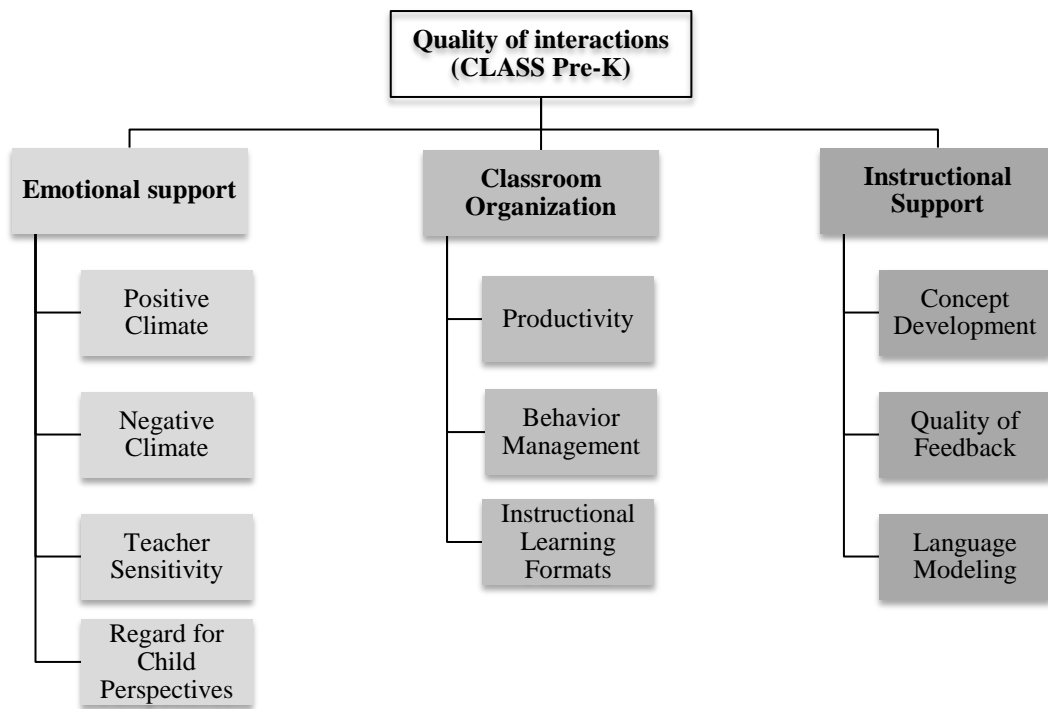


Figure 2. Domains and dimensions of the quality of interactions in the group (adapted from Pianta et al., 2008)

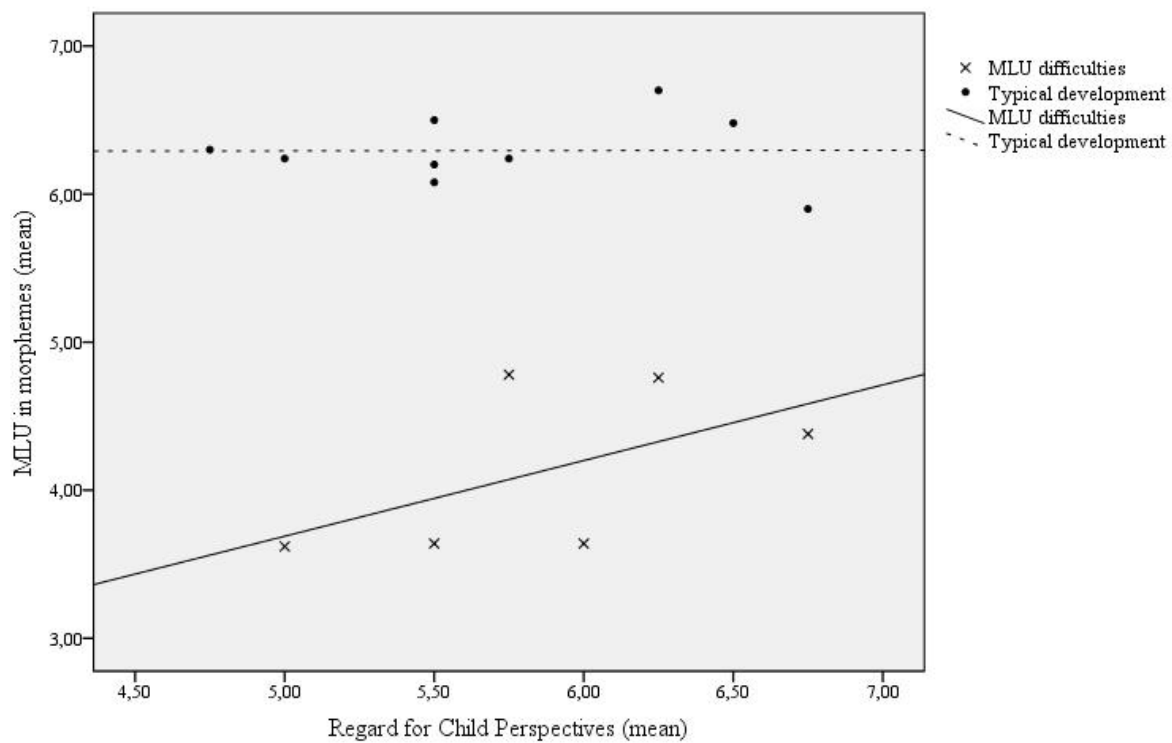


Figure 3. Comparison of regression slopes (MLU-D vs TD) for the dimension of Regard for Child Perspectives