

Measuring Quality in Two Early Childhood Education Contexts: Centre-Based Childcare and Four-Year-Old Preschool

Maude Roy-Vallières¹, Annie Charron², Nathalie Bigras² and Lise Lemay²

¹ Faculté des sciences de l'éducation, Université Laval, Québec, Canada

² Faculté des sciences de l'éducation, Université du Québec à Montréal, Montréal, Canada

Correspondence: Maude Roy-Vallières, Université Laval, Faculté des sciences de l'éducation, Québec, QC, G1V 0A6, Canada.

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Abstract

The quality of early childhood experiences is crucial to a child's development and educational success. Yet few early childhood education and care services in the world today offer a consistently high level of educational quality. In particular, educational quality depends on the context's characteristics. The aim of this study was therefore to measure and compare the educational quality experienced in two distinct educational contexts, located in Quebec: early childhood centres and 4-year-old preschools. Results of the study indicate that there are very few significant differences between these two educational contexts in terms of interaction quality and pedagogical orientations quality, while variables related to structural quality vary greatly. Correlational and regression analyses carried out separately on each educational context show that few variables are predictive of interaction quality levels, suggesting that other variables, notably related to pedagogical orientations quality, would better explain variations in adult-child interactions predictive of child development. These results have implications for initial training curriculum aimed towards adults working in early childcare and for future directions in research on educational quality, including rethinking the importance of pedagogical orientations and structures in the ecosystemic model of quality.

Keywords: educational quality, pre-kindergarten, early childhood education services, mixed methods

1. Introduction

Early childhood, which refers to the developmental period between the ages of 0 and 5, has long been recognized as crucial to children's educational success and future adult life (April et al., 2018; Simard et al., 2018). This is due to the significant changes initiated in the brains of young children. During the first 1,000 days of life, numerous neuronal connections, namely pathways between neurons to share information, are established, which are then pruned according to the rich, varied and stimulating life experiences to which the child is subjected (Tooley et al., 2021).

Between the ages of 0 and 5, educational experiences take place in the family and community environment, as well as in early childhood education and care services offered in many countries. With their growing accessibility, more and more children are spending most of their day in these educational contexts. Indeed, in 2016, the Organisation for Economic Cooperation and Development (OECD) estimated that over 80% of 3- to 5-year-old children attended an early childhood education and care service, varying by country (see Figure 1; OECD, 2016). Specifically, in Quebec, Canada, more than 80% of children 0- to 5-year-old spend between 7 and 9 hours a day in early childhood education and care services (Groleau & Aranibar Zaballos, 2022). In the wake of this trend, several researchers aimed to explore whether attending an early childhood education and care service was beneficial for young children's development.

A recent meta-analysis by Van Huizen and Plantenga (2018), focusing on the effects of universal early childcare education programs, has provided some answers to this question. Their analyses estimated the impact of these programs on numerous indicators of child development, including motor, socio-emotional, mental (concentration) and regulatory abilities, as well as cognitive outcomes in numeracy, oral and written language. The results of this meta-analysis showed that the effects were rather mixed, with one third of programs associated with significantly beneficial effects on developmental indicators, one sixth showing significantly negative effects, and most

revealing no significant effect at all. However, among the educational programs' characteristics considered in this meta-analysis, Van Huizen and Plantenga (2018) raised that early childhood education and care service quality was systematically correlated with benefits for children's development.

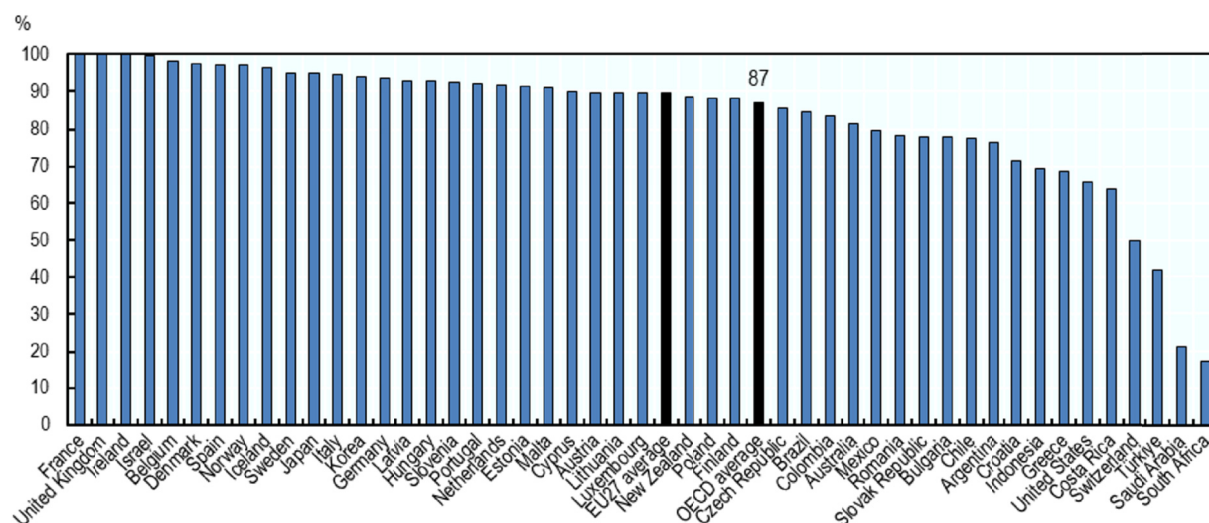


Figure 1. Enrolment rates in early childhood education and care services and primary education, 3- to 5-year-olds (OECD, 2016)

1.1 Defining Educational Quality in Early Childhood Education and Care Services

The “educational quality” notion is generally used to qualify educational systems or programs’ potential to foster children’s well-being and overall development (Lokken et al., 2018; Slot, 2018). While there is, to date, no universal definition of educational quality (OECD, 2015), positivist early childcare researchers define the quality notion using three main elements: (1) structural quality, which concerns aspects of early childhood education and care services typically regulated by laws such as adult training or group size (Bigras et al., 2020; Ishimine et al., 2010; Ruopp, 1979); (2) process quality, namely the interactions that take place between the child, material, activities offered and other people, either the adult or peers (Bigras et al., 2020); and (3) pedagogical orientations quality, a recently defined element that addresses adults’ beliefs about their professional role, educational values, epistemological beliefs and attitudes towards educational themes, learning objectives and pedagogical approaches (Anders, 2015). In addition, in a meta-analysis focusing specifically on structural and process variables, Sabol et al. (2013) showed that it was the quality of adult-child interactions, a component of process quality, that demonstrated the strongest links with measures of child development. Interaction quality is therefore the most relevant variable to measure to estimate the impact of attending a specific type of early childhood education and care service on child development, without having to carry out costly longitudinal studies.

Assessing educational quality, however, is not simply a matter of considering these elements in isolation, since they are interrelated and influence each other. The ecosystemic model of educational quality (Figure 2; Bigras et al., 2020), based on Bronfenbrenner’s (1979) ecological perspective, illustrates the complexity of the child’s early childhood education and care service experience through interlocking systems, placing the child in its centre. Five interrelated systems shape the educational quality and influence the child’s development: the *ontosystem*, comprising the child’s personal characteristics; the *microsystem*, encompassing the family environment and prekindergarten services; the *mesosystem*, integrating the relationships between the family and external agents (educators, researchers, community centres, etc.); the *exosystem*, which refers to family policies, childcare legislation and socio-economic context; and the *macrosystem*, which concerns the culture, values and ideologies relating to the educational quality of childcare environments. Finally, the *chronosystem* represents the changes that are made to the various systems over time, representing the evolution of society.

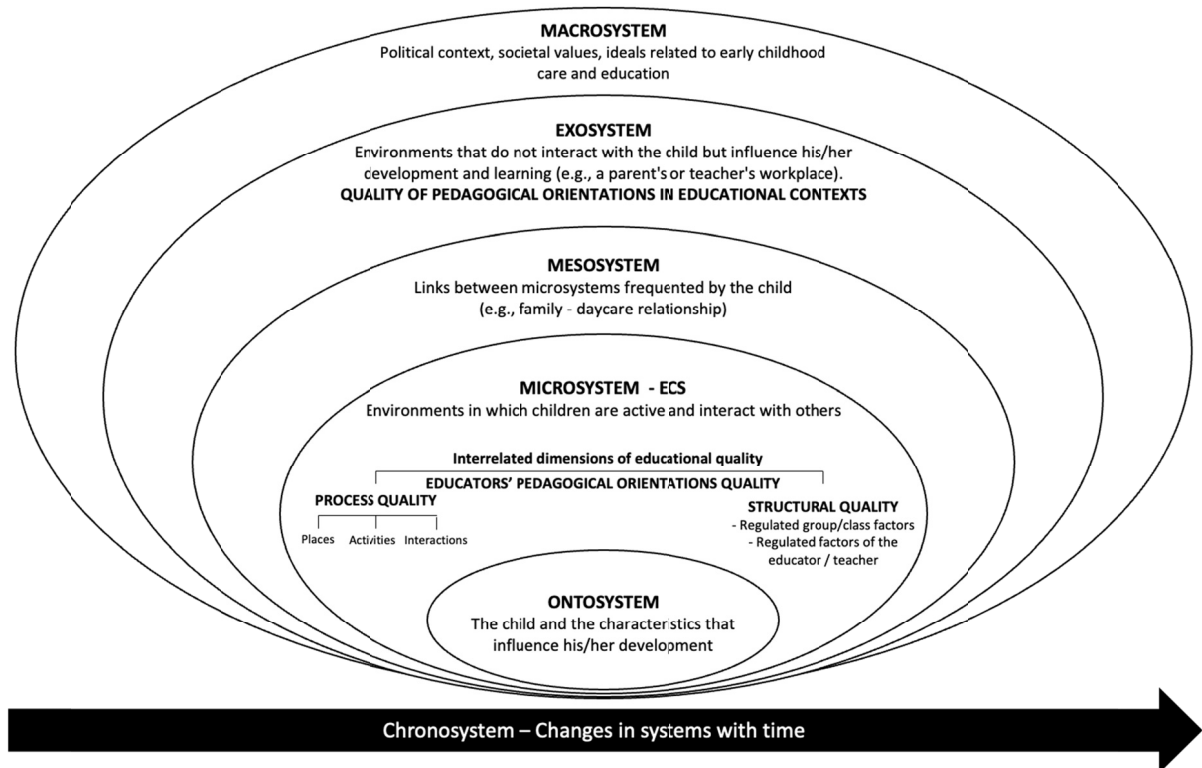


Figure 2. Ecosystemic model of educational quality (Free translation; Bigras et al., 2020)

It should be noted that the components found in the microsystem have a greater impact on child development, since they are in direct contact with the child (Bigras et al., 2020). Educational quality's three elements can also be found within the microsystem, following a degree of hierarchy. More specifically, Figure 3 shows that structural quality and pedagogical orientations quality affect experiences that make up process quality, i.e., they change the nature, type, or variety of these experiences for children. For example, a larger number of children in the group means less time for the adult to interact with each of them. It is thus possible to understand why interactions quality, more proximal to the child, acts and predicts his or her development and educational success to a greater extent, whereas structural variables and those of more distal pedagogical orientations act rather indirectly through their impact on process quality.

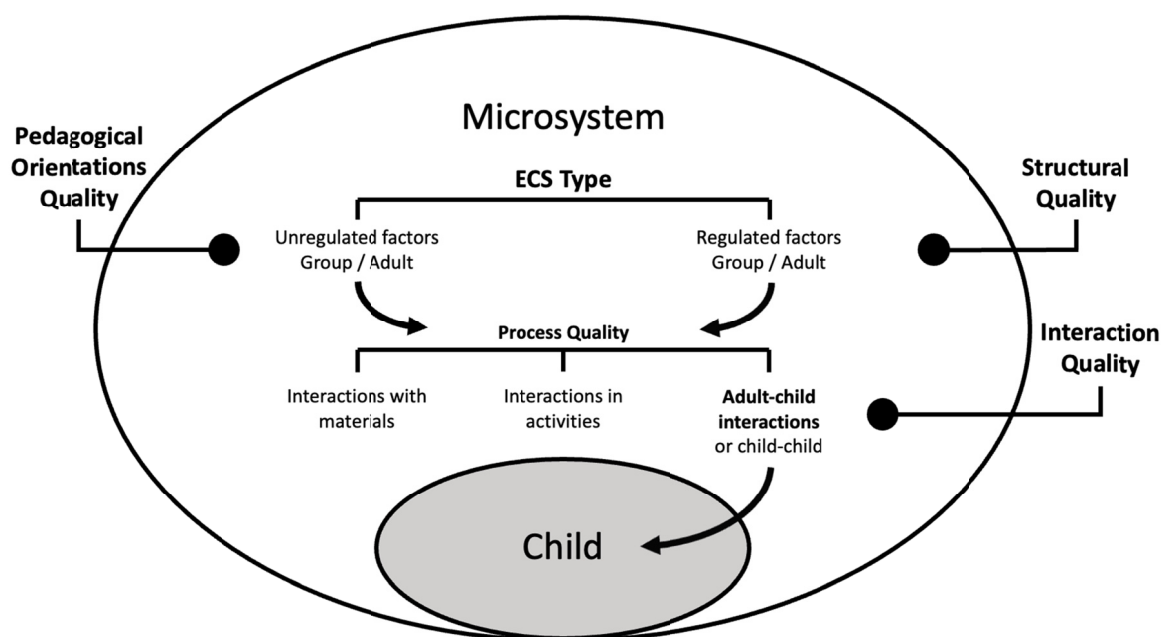


Figure 3. Hierarchical representation within the microsystem

Considering this nexus of effects, changing the parameters of one of the elements of educational quality could result in higher or lower levels of global educational quality. In fact, a study by Vermeer et al. (2016) showed that the quality of educational services varied greatly from one country to another, depending in particular on the educational contexts observed. Some countries, such as France or the United States, offer preschool-type educational contexts between the ages of 3 and 5, which can sometimes give rise to a pre-primary approach. This educational approach is characterized by adult-led activities including formal transmission of knowledge (Anders, 2015), with a prioritization of academic learning such as reading and writing. Other countries, such as Sweden, opt instead for early childhood education and care services up to age 7, which tend to favour a social pedagogy approach. This approach emphasizes children's autonomy, learning in a playful context (Wall et al., 2015) and a focus on the child and his or her overall development (Edwards, 2021).

However, it is difficult to estimate which of these educational contexts is more supportive of high levels of educational quality. Indeed, as they are typically used in different countries, one can hardly isolate the influence of a specific educational context on observed quality levels with regard to a specific social, political, cultural or economic system. It is therefore difficult to draw conclusions about the educational quality offered in these contexts, valuing diverse practices, by making cross-country comparisons. Despite this, given that the study by Hamre et al. (2014) showed that few early childhood education and care services around the world managed to offer consistently high levels of educational quality, it is imperative to assess how educational quality is operationalized in educational contexts to ensure the development of children's full potential, all around the world. This study therefore aimed to compare how educational quality is expressed in two distinct educational contexts, but evolving within the same culture (Quebec, Canada), thus eliminating the need to take contextual variables into account when comparing educational quality (Slot, 2018).

1.2 Quebec's Early Childcare Services

Quebec's pre-kindergarten services offer a rich field of research for achieving this goal. In Quebec, 4-year-olds have access to a variety of educational contexts where they are exposed to varied structural and contextual characteristics. In addition, the 2012 and 2017 preschool children development surveys (Institut de la statistique du Québec, 2012; Simard et al., 2018) revealed that just over a quarter of Quebec children were vulnerable, with an upward trend, on at least one aspect of their overall development, whether motor, social, affective, cognitive or communicational. These surveys underline the need to assess educational quality in settings offered to Quebec children, in order to draw up recommendations that can be useful both in Quebec and internationally.

It seems relevant to compare 4-year-old preschools with Quebec's early childcare centres (ECC). In addition to

both being required to provide an educational program (Ministère de la Famille, 2019; Ministère de l'Éducation, 2021), structural conditions in ECC prove rather stable from one facility to the next compared to other services (e.g., private daycares or family settings), while being more similar to those of 4-year-old preschools. It should also be noted that both settings are subsidized by a Quebec government ministry, helping limit the influence of other variables, such as profit generation, on operations.

Finally, while it's true that ECC have in the past catered to a higher proportion of four-year-olds when compared to 4-year-old preschools, a proportion of 19.4% versus 4.1% in 2017 (Institut de la statistique du Québec, 2019), the *Enquête québécoise sur l'accessibilité et l'utilisation des services de garde* noted that, in 2021, nearly a third of parents planned to use 4-year-old preschools when their child reached the appropriate age (Institut de la statistique du Québec, 2022). This suggests a growing interest in 4-year-old preschools on the part of Quebec parents. Furthermore, although located in the same Quebec cultural context and presenting similarities, these two types of early childhood education and care services present different structural and contextual characteristics.

Evidence from the literature on educational approaches in 4-year-old preschools and ECC suggest that they are respectively not totally in line with the pre-primary approach nor the social pedagogy approach. In other words, the educational approach experimented with in these two educational contexts lies on a continuum from social pedagogy to the pre-primary, incorporating elements of one or the other. For example, although the educational program for 4-year-old preschools prioritizes the child's overall development and the value of play for learning (Ministère de l'Éducation, 2021), April et al. (2018) observed that some practitioners adopted an interventionist attitude, emphasizing the gaps to be filled rather than overall development. Thus, rather than attempting to qualify educational approaches, it is more relevant to focus directly on the quality of the educational contexts in which these approaches are put in place, which represents a more proximal indicator of 4-year-olds' experience.

1.3 Educational Quality Indicators in ECC and 4-Year-Old Preschools

The literature already provides some clues as to the structural quality of 4-year-old preschools and ECC. First, in Quebec, there is a clearer distinction between 4-year-old preschools and other early childhood education and care services, being a more recent addition to the early child education and care landscape (Fédération autonome de l'enseignement (FAE), 2020), and coming under the Ministry of Education rather than the Ministry of Family. Service organization in 4-year-old preschools, although it may differ from one teacher to another, is similar to that of elementary school. Classes of up to 17 4-year-olds are taught by teachers who generally hold a bachelor's degree in preschool and elementary education (Gouvernement du Québec, 2020).

Depending on the number of children in the class and the financial and human resources available, these teachers are sometimes accompanied by an assistant for a few hours a day, whose role is to help children's integration in the classroom, support their development and collaborate with the teacher. The 4-year-old preschool classes are integrated into elementary schools, meaning that the children attending are the youngest in their building, some of whom are not even having an outdoor recess or a reserved section on the outdoor playground. Teachers spend around 5 hours a day with the children in their class and have access to 20 planning days a year (Alliance des professeures et professeurs de Montréal, 2012), in addition to having to complete at least 30 hours of professional development every two years (Loi sur l'Instruction Publique, 2021).

The organization of ECC differs in a number of ways from that of 4-year-old preschools. First, in terms of adult-child ratio, it must not exceed 10 children for each educator who has qualifying training, such as a college diploma in early childcare or an attestation of college studies (Ministère de la Famille, 2016, 2018). The 4-year-olds at the ECC are the oldest in their institution, and the layout of the outdoor courtyards meets their constantly evolving motor needs. Educators are present with the children at all times of the day: morning welcome, meals and snacks, outdoor play, and rest. They are therefore involved with children for 7 to 9 hours a day, some on a schedule of 4 days a week (Government of Quebec, 2023).

A recent meta-analysis by Slot (2018) showed that studies that have attempted to relate different structural variables, such as group size or adult training, to child development achieve mixed results. However, structural quality could help or hinder child development through its moderating effect on other aspects of educational quality, notably interaction quality (Slot, 2018). A few studies have been conducted on educational quality and, more specifically, adult-child interaction quality, in ECC and 4-year-old preschools in Quebec.

In ECCs, the 2003 and 2014 *Grandir en qualité* studies explored educational quality on a national level but did not include preschools. This research reports that adult-child interaction quality is at a high average level in ECC, using the *Échelle d'observation de la qualité éducative* (ÉOQÉ; Drouin et al., 2004; Institut de la statistique du Québec, 2015). Several other studies carried out by research teams subsequently found similar results (Bigras et al., 2010, 2017; Bouchard et al., 2021; Japel et al., 2005; Lemay et al., 2021), including a study by Bouchard et

al. (2021) that used the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008) to measure interaction quality. Nevertheless, it is important to point out that these studies are not recent, and the tools used to measure interaction quality were not the same, making them difficult to compare.

In 4-year-old preschools, eight Quebec studies have been conducted to explore educational quality, including one for which data remains inaccessible (April et al., 2014). Most of these studies used the CLASS tool (Pianta et al., 2008) to measure adult-child interaction quality. Findings from these studies, presenting data covering 2010 to 2022, generally reveal medium-high levels for Emotional Support and Group Organization, and medium-low levels for Instructional Support (April et al., 2018; Cantin et al., 2010, 2014; Charron et al., 2021; Roy-Vallières, 2023; St-Jean, 2020). Studies that included a long-term mentoring component for teachers also showed some level of increase in interaction quality levels over time (Cantin et al., 2010, 2014; Charron et al., 2023; St-Jean, 2020). The only study that particularly stands out from these results is Japel et al.'s (2017) 2015 study using the *Early Childhood Environment Rating Scale - Revised* (Harms et al., 2015). It had indeed revealed low levels of educational quality, averaging scores of 3 on a scale of 1 to 7 (1 = low; 7 = high). It should also be noted that sample sizes varied widely from one study to another, ranging from 5 participants (April et al., 2018; St-Jean, 2020) to 48 participants (Cantin et al., 2010), and that the type of 4-year-old preschool studied was not always the same, with some studies focusing on part-time (5 half-days per week) or full-time 4-year-old preschools, or including both types.

Thus, when we consider studies carried out individually in ECC and 4-year-old preschools, several limitations stand out. First, the studies on interaction quality in 4-year-old preschools were more recent than those on ECC, making it impossible to compare them on the basis of the historical context. Second, the tools used to assess educational quality differ from one study to another (ÉOQÉ, CLASS, ECERS-R), making it difficult to compare results and establish an overall view of educational quality. Third, to our knowledge, no study has directly compared the levels of interaction quality in ECC and 4-year-old preschools, making it hard to draw conclusions about the educational quality ecosystem that exist in these two educational contexts.

1.4 Research Objectives

This study therefore aimed to (1) compare levels of structural, pedagogical orientations and interaction quality in ECC and 4-year-old preschools, and (2) identify which structural and pedagogical orientations variables explain the greater share of interaction quality scores in educational settings catering to 4-year-olds.

2. Method

2.1 Participants

This study targeted teachers and educators working with 4-year-olds in Quebec's preschools and ECC. Matching by school district territory yielded two groups of participants with similar proportions from six separate school districts. Participants were recruited from the Greater Montreal and Montérégie regions. Once approval had been obtained from a school district, school and ECC administrators in the area were contacted, by e-mail and telephone, to obtain permission to carry out observations in their establishments. Teachers and educators were then contacted individually by e-mail to obtain their consent to participate in the study. A sample of 45 4-year-old preschool teachers and 45 ECC educators was thus recruited for the present study, for a total of 90 participants.

4-year-old preschool teachers were almost all women (95.6%), most often in the 40–49 age bracket (44.4%). Most of them also spoke French as their native language (80.0%). As for educators in ECC, they were also overwhelmingly female (91.1%), and most often spoke French (64.4%). They numbered 37.8% in the 50–59 age bracket, followed by 22.2% in the 30–39 age bracket. There were no significant differences between the two groups on these variables.

2.2 Measurement Tools

2.2.1 Self-Administered Questionnaire for the Educator/Teacher

To measure the structural and pedagogical orientations variables of educational quality, likely to affect adult-child interaction quality, an adaptation of the *Self-Administered Educator Questionnaire* (QP-1; Drouin et al., 2004) was completed online by participants. The questionnaire includes 21 questions divided into three sections:

- 1) Group composition, work experience and professional development – 15 items (e.g., group size, years of experience, professional development in the last 12 months);
- 2) Level of education and training – 2 items (e.g., highest diploma obtained, recognized training completed);

3) Personal information – 4 items (gender, age, native language, and profession).

Information on material and social disadvantage in the educational contexts was collected through the Government of Quebec's 2016 public dataset (Institut national de santé publique du Québec, 2023).

2.2.2 Classroom Assessment Scoring System, Pre-K

To measure interaction quality, the Classroom Assessment Scoring System (CLASS), preschool version (Pre-K) was used (Pianta et al., 2008). The CLASS Pre-K consists of three domains and ten dimensions: Emotional Support (positive/negative climate, adult sensitivity, regard for student perspectives), Classroom Organization (behaviour management, productivity, instructional learning formats) and Instructional Support (concept development, quality of feedback, language modelling). Observation using the CLASS Pre-K takes place over 30-minute cycles (20-minute observation, 10 minutes coding) and involves assigning a score for each dimension on a scale of 1 to 7 (1–3 = low, 3–5 = medium, 6–7 = high) based on observable indicators (Pianta et al., 2008). At the end of observation, scores are averaged per dimension, while domain scores are calculated from the average of their respective dimensions. This measurement instrument has good reliability, with internal consistency coefficients ranging from acceptable to excellent depending on dimensions (0.73 to 0.9; Lemay et al., 2021; Pianta et al., 2008).

2.3 Data Collection

Data collection took place between December 2021 and May 2022, involving one morning per participating class or group. A single observation was completed for each participant, as previous studies have shown that CLASS Pre-K scores are relatively stable over time (Pianta et al., 2008; Praetorius et al., 2014). To maximize chances that the observation would be representative of typical activities, participants were asked to suggest observation times that did not involve special activities (e.g., performance, special day at school, outing). Observations were therefore carried any day of the week (Monday to Friday), depending on participants' input. On the day of data collection, certified observers carried out four observation cycles in the classroom or group, for an average of two hours of observation.

To ensure that any variation observed between classes or groups resulted from adult-child interactions and not observer bias, inter-observer agreements were performed on the study sample. According to previous studies, a sample size corresponding to 15% of all observations is sufficient to ascertain the rate of inter-observer agreement (Bujang & Baharim, 2017; Pianta et al., 2008; Roy-Vallières et al., 2021). We therefore performed 16 interjudge agreements on our sample (17.8%), i.e., 8 interjudge agreements per group of participants (preschools and ECC). The simple agreement method (Pianta et al., 2008), which tolerates a one-point deviation from the CLASS Pre-K results, was used, giving average agreement rates of 87.5% for 4-year-old preschools and 82.2% for ECC. This corresponds to an acceptable level of inter-observer agreement (Cicchetti, 1994).

The self-administered questionnaire was sent electronically to participants prior to the observation day, as soon as they handed in their signed consent form to participate in the study.

2.4 Data Analysis

In order to address the first research objective, i.e., to measure and compare the levels of structural and interaction quality in ECC and 4-year-old preschools, descriptive analyses were carried out on the data obtained with the CLASS Pre-K, as well as those retrieved online via the questionnaire. Student's t-tests for independent samples and chi-square analyses were also used to determine whether the data differed significantly between the two participant groups. Finally, for some open-ended questions in the questionnaire, qualitative content analyses by theme were carried out to describe results.

To address the second research objective, i.e., to determine which structural and pedagogical orientations variables explain the greatest proportion of interaction quality scores, Pearson correlation analyses (Pearson, 1895) were carried out between CLASS Pre-K domain scores and questionnaire variables, followed by multiple regression analyses to predict whether a change structural or pedagogical orientations variables, such as a reduction in group size, led to a change in interaction quality scores (Hayes, 2017).

3. Findings

3.1 Objective 1: Compare Levels of Structural, Pedagogical Orientations and Interaction Quality in ECC and 4-Year-Old Preschools

Table 1 shows descriptive statistics for continuous structural quality variables, as well as Student's t-test results. The analyses showed many significant differences between the two educational contexts. Regarding the study's continuous structural variables, level of material disadvantage, group size and hours of professional development

completed in the last year were significantly higher in 4-year-old preschools. On the other hand, years of experience was greater among EDD educators, with an average of 5 more years of experience in a ministry-recognized educational service, and twice as many years of experience in their current job compared to 4-year-old preschool teachers.

Table 1. Significant differences between 4-year-old preschools and ECC for continuous structural variables

Variable	Preschools (N = 45)		ECC (N = 45)		t-test		
	M	SD	M	SD	t	df	p
<i>Material disadvantage</i>	65.74	28.42	46.00	32.03	2.958	80	0.004
<i>Group size</i>	13.38	2.60	11.36	3.74	2.968	88	0.004
<i>Hours of prof. development</i>	17.73	17.69	12.09	12.09	1.262	87	0.210
<i>Years of exp. – Current job</i>	9.31	7.96	16.77	10.33	-3.838	88	< 0.001
<i>Years of exp. – Recognized service</i>	12.70	9.37	17.71	9.31	-2.541	88	0.006

Regarding categorical structural variables, the results of chi-square analyses (see Table 2) show that 4-year-old preschool teachers are more likely than ECC educators to have a bachelor's degree, and more likely to have completed training in educational approaches and interventions in the last year. On the other hand, analyses show that ECC educators tend to have any kind of degree specialized in education, childcare or child development.

Table 2. Significant differences between 4-year-old preschools and ECC for categorical structural variables

Variable	Preschools (N = 45)		ECC (N = 45)		Chi-squared		
	N	%	N	%	X ²	df	p
<i>Bachelor's degree</i>	32	71.1	7	15.6	63.311	3	< 0.001
<i>Specialized degree</i>	35	77.8	44	97.8	8.389	1	0.004
<i>Training in educational app. and intervention</i>	24	53.5	12	26.7	6.667	1	0.010

As for pedagogical orientations quality, three questions addressed this aspect of educational quality: the number of years participants would like to stay in their current job, the most appreciated elements of the job, and the most common challenges. For the first question, a thematic frequency analysis revealed that most teachers (33.3%) and educators (40%) chose the “it depends” option (see Table 3).

Table 3. Number of years participants plan to stay in their jobs

Answer choices	Preschool (N = 45)		ECC (N = 45)	
	N	%	N	%
I'm currently considering leaving the field	0	0.0	2	4.4
Less than 2 years	3	6.7	3	6.7
From 2 to 5 years	8	17.8	7	15.6
From 5 to 10 years	7	15.6	6	13.3
More than 10 years	12	26.7	9	20.0
It depends	15	33.3	18	40.0

To explain these answers, several 4-year-old preschool teachers mention that their level of motivation to work fluctuates over time. They also indicated a high level of physical and mental workload, which could eventually lead them to change jobs, as well as an interest in moving to another grade level. For their part, educators mention an interest in a career change, changing work conditions, a lack of resources and time, and the good physical and mental health needed to pursue this work. Both groups also mentioned administrative restrictions limiting their decision-making power to stay with 4-year-olds, notably regarding the choice of position or age group, according to seniority.

Table 4. Participants' greatest challenges and most appreciated aspects of their work

	<i>Preschools</i>		<i>ECC</i>	
Greatest challenges	<i>Weighted frequency</i>	<i>Participant %</i>	<i>Weighted frequency</i>	<i>Participant %</i>
Children with special needs	9	20.0	17	37.8
Lack of resources or time	8	17.8	5	11.1
Educational differentiation	4	8.9	7	15.6
Collaboration with families	6	13.3	5	11.1
Group size too large	6	13.3	0	0.0
Communication in French	4	8.9	0	0.0
Management of social-emotional skills	0	0.0	4	8.9
Classroom management	3	6.7	0	0.0
Building relationships with children	0	0.0	3	6.7
Most appreciated aspects	<i>Preschools</i>		<i>ECC</i>	
	<i>Weighted frequency</i>	<i>Participant %</i>	<i>Weighted frequency</i>	<i>Participant %</i>
Interactions with children	23	51.1	22	48.9
Witnessing children's progress	13	28.9	21	40.0
Pedagogical flexibility	5	11.1	3	6.7

As for questions about what they liked and what they found challenging, content analysis by theme showed that most teachers and educators reported the same elements (see Table 4). The three most cited positive elements concerned interactions with children (51.1% and 48.9%), witnessing children's progress (28.9% and 46.7%), as well as flexibility and perceived freedom in applying the educational program and planning with regard to the interests of children in the group (11.1% and 6.7%). In contrast, the three greatest perceived challenges were managing special-needs children in the group (20.0% and 37.8%), lack of resources or time (17.8% and 11.1%) and working with families (13.3% and 11.1%).

Finally, results obtained in terms of interaction quality levels observed in 4-year-old preschools and ECC show little difference between the two groups, whose averages are similar for the CLASS Pre-K dimensions and domains (see Table 5).

Table 5. Scores on CLASS Pre-K domains and dimensions in 4-year-old preschools and ECC and differences between groups

Domain/ Dimensions	Preschools (N = 45)				ECC (N = 45)				t-test		
	Min	Max	M	SD	Min	Max	M	SD	t	df	p
Emotional support	4.00	6.69	5.78	0.57	4.69	7.00	5.89	0.57	-0.85	88	0.399
Positive climate	3.25	7.00	5.96	0.78	4.75	7.00	5.88	0.68	0.54	88	0.589
Negative climate	1.00	2.50	1.53	0.44	1.00	3.00	1.55	0.48	-0.23	88	0.821
Adult sensitivity	3.00	7.00	5.88	0.78	4.25	7.00	5.81	0.78	0.44	88	0.661
Regards for student perspectives	3.00	6.25	4.83	0.79	2.75	7.00	5.41	0.89	-3.29	88	0.001
Classroom organization	4.17	6.58	5.81	0.55	3.58	7.00	5.70	0.73	0.82	88	0.415
Behaviour management	3.00	7.00	5.66	0.92	2.75	7.00	5.63	0.98	0.18	88	0.860
Productivity	4.00	7.00	6.06	0.54	3.50	7.00	5.98	0.73	0.54	88	0.593
Instructional learning formats	4.50	7.00	5.73	0.65	3.25	7.00	5.50	0.87	1.41	88	0.162
Instructional support	1.67	4.50	2.81	0.63	1.58	5.33	2.70	0.80	0.74	88	0.463
Concept development	1.00	3.75	2.31	0.69	1.00	5.00	2.17	0.93	0.81	88	0.422
Quality of feedback	1.50	5.00	2.69	0.75	1.25	5.00	2.50	0.85	1.14	88	0.258
Language modelling	2.00	5.00	3.44	0.82	1.75	6.00	3.44	0.95	0.03	88	0.488

A Student's t-test reveals that the two groups are indistinguishable in terms of mean scores for the three CLASS Pre-K domains, as well as for most dimensions. They differ significantly only in the Regard for student perspectives dimension. Higher mean scores are observed in ECC groups ($M = 5.41$; $S.-T. = 0.89$) than in the 4-year-old preschool classes ($M = 4.83$; $S.-T. = 0.79$). It thus appears that the teachers and educators in this study

generally show a similar level of quality in adult-child interactions, i.e., medium high for Emotional Support and Classroom Organization, and low for Instructional Support. Hence, study participants are less proficient in adult-child interactions promoting higher-order thinking skills and encouraging children's use of language, which belong to Instructional Support.

3.2 Objective 2: Identify Which Structural and Pedagogical Orientations Variables Explain the Greater Share of Interaction Quality Scores

Initially, we wanted to identify variables that could explain observed differences in interaction quality between the two groups of participants in the study. However, given that there were very few significant differences between educators and teachers in terms of adult-child interactions, but that there were several structural differences, we carried out correlation and regression analyses separately to identify predictors of variations in interactions within groups. Some data had to be transformed in order to be inserted into the regression, notably the age variable (e.g., 50–60 or not), which was dichotomized. Others were removed due to their multicollinearity, such as native language, where French was highly and inversely correlated with a foreign native language. For both groups, several variables were significantly correlated with the three CLASS Pre-K domains, but only a handful of variables were found to be predictive of interaction quality levels, which are presented in the sections below.

3.2.1 4-Year-Old Preschools

Table 6 shows predictors of interaction quality in 4-year-old preschools. In terms of Emotional Support, the results show that the model explains 40.2% of the variance in scores ($R^2 = 0.402$, $F(6) = 4.026$, $p = 0.003$). However, none of the variables correlated with Emotional Support scores in 4-year-old preschools made a significant contribution to the model, indicating a certain homogeneity in teachers' practices, regardless of their personal or professional characteristics.

Table 6. Regression coefficients for CLASS Pre-K domains in 4-year-old preschools

Variable	Emotional Support	Classroom Organization	Instructional Support
Intercept	6.053**	6.024**	2.777**
Material disadvantage	-0.003		
Age group - 50 to 60	-0.276		
Graduate diploma		-0.471**	
Native Language - Foreign	-0.305		
Years of experience - Other	-0.023	-0.041**	
Professional development - 1h to 9h	0.336		
Compensation for prof. dev. - Sometimes	0.301		
Training subject - Assessment			1.723**

Note. * = 0.05; ** = 0.01; *** = 0.001.

At the Classroom Organization level, regression analysis revealed that the model explained 28.1% of the variance in scores obtained by teachers ($R^2 = 0.281$, $F(2) = 8.210$, $p < 0.001$). In the model, having a graduate degree, i.e., a master's or doctorate, corresponds to an average decrease of 6% (0.47 points) in Classroom Organization scores, while experience in another educational service corresponds to a decrease of 0.5% (0.04 points).

Regarding Instructional Support, only having received ongoing training in learning assessment predicted scores in this domain in 4-year-old preschools. Regression analysis showed that a predictive model including this variable explained 16.4% of the variance in scores ($R^2 = 0.164$, $F(1) = 8.421$, $p = 0.006$), with a fairly significant impact on the score itself (an increase of 24.6% or 1.72 points on average).

3.2.2 ECC

Table 7 shows predictive variables for ECC. Results of the analysis showed that the regression model explained 25% of the variance in Emotional Support scores obtained by educators ($R^2 = 0.250$, $F(3) = 4.561$, $p = 0.008$). However, no variable was significantly predictive, suggesting a certain homogeneity in quality levels in this domain, regardless of participant characteristics.

Table 7. Regression coefficients for CLASS Pre-K domains in ECC

Variable	Emotional Support	Classroom Organization	Instructional Support
Intercept	6.149**	5.778**	5.333**
Age group - 30 to 40		0.484	
Age group - 50 to 60	-0.249	-0.288	
Bachelor's degree	-0.504		-0.635
Specialized diploma in education			-2.405**
Native language - EN		1.394**	
Native language - Foreign	-0.292		-0.449
Professional development - 20h and +			-0.372
Wishes to stay 2 to 5 years in the job		-0.873**	

Note. * = 0.05; ** = 0.01; *** = 0.001.

In terms of Classroom Organization domain scores, regression analysis reveals that adding all four correlated variables to the model explains 44.3% of the variance in these scores ($R^2 = 0.443$, $F(4) = 7.969$, $p < 0.001$). Regarding the predictor variables themselves, having English as one's mother tongue and wanting to stay in one's job for the next 2 to 5 years were significant in the model. For the first variable, the association is positive, predicting a 19.9% higher score (1.39 points). Otherwise, educators who selected the answer "2 to 5 years" for the number of years they intended to stay in their current job scored an average of 12.4% (0.87 points) lower on the CLASS Pre-K 1–7 scale, a significant difference. However, a small number of participants chose this option, suggesting that it should be interpreted with caution.

Finally, for Instructional Support scores in ECC, regression analysis indicates that the model including the four correlated variables explains 45.7% of the variance in scores ($R^2 = 0.457$, $F(4) = 8.422$, $p < 0.001$). We also note that only the specialized education diploma variable has a significant weight in the model, implying a drop of 34.4% (2.41 points) on average.

In summary, there were significant differences between the two groups for several of this study's structural variables, while the only significant difference observed in terms of adult-child interaction quality concerned the Regard for student perspectives dimension, favouring ECC educators. It should also be noted that predictors of CLASS Pre-K domain scores were not the same for preschools and ECC, suggesting that structural variables of educational quality affect the two educational contexts differently. Finally, regression models explained 16.4% and 45.7% of the variance in CLASS Pre-K scores.

4. Discussion

4.1 Structural, Pedagogical Orientations and Interactions Quality

In Quebec, over the past few years, numerous studies have assessed educational quality and, more specifically, interaction quality, in ECC and 4-year-old preschools. Results from the present study show that, despite important structural differences, 4-year-old preschools and ECC offer a similar level of interaction quality, indicating that they meet most children's emotional and organizational needs, regardless of the educational context, without, however, adequately supporting cognitive and language learning. We can thus see that, despite significant attention paid to educational quality in Quebec's early childhood education services, there is still work to be done to improve variables that influence children's educational success.

It should be noted that the levels of interaction quality observed in the present study are consistent with those found in previous literature. Interaction quality levels are indeed within global averages, i.e., medium high for Emotional Support and Classroom Organization, and low for Instructional Support (e.g., Bigras et al., 2010; Bouchard et al., 2021; Charron et al., 2021; Cloney et al., 2017; Hu et al., 2016). These results suggest that, in general, interaction quality levels are sufficient to support the development and learning of 4-year-olds in both preschools and ECC, but that there is also a need to increase educational quality levels in terms of Instructional Support.

Thus, it seems relevant to suggest adding, both to initial college and university training and to professional development, the topic of practical inquiry (open-ended questions, sustained exchanges, planning and categorization) and concept development (links between activities, links with daily life, links between new words and known words) to support ECC educators and 4-year-old preschool teachers in terms of Instructional Support (Bigras et al., 2020; Cloney et al., 2017; Hatfield et al., 2016; Hu et al., 2016). It is also possible that these concepts are already taught, but more difficult to transfer into practice since they are less visible in the field during internships (Nguyen et al., 2014; Wittorski, 2014). Considering the reduced number of Instructional

Support quality predictors, it seems important to look at possible improvements to ensure that their concept of Instructional Support is aligned with research-supported indicators derived from standardized tools such as the CLASS Pre-K.

4.2 Predictors of Interaction Quality

With regard to predictors of the three domains of interaction quality, it is interesting to note that they are not the same in 4-year-old preschools and in ECC. This finding raises the importance of examining intra-contextual, rather than inter-contextual, variances, and suggests that the laws and regulations that frame the two educational contexts include marked differences that exert an influence on educational quality, and particularly structural quality, in these settings. This raises the question of why decision-makers formulate different structural requirements for educational contexts that target the same population of children with the same needs, because they are attached to different government entities.

As for the predictor variables themselves, these seem consistent with what has been observed in previous research. In 4-year-old preschools, the decline in interaction quality scores associated with holding a graduate degree is similar to that observed in the study by Justice et al. (2008), who suggested that graduate studies do not necessarily lead to learning more about educational quality criteria, while the decrease in Classroom Organization scores associated with work experience in an “other” type of service, i.e., not recognized by a ministry, contributes to the mixed results regarding the influence of work experience on interaction quality (Connor et al., 2005; Hu et al., 2016; Kuger et al., 2015; LoCasale-Crouch et al., 2007). This accumulation of years of experience, combined with less optimal educational practices from the point of view of interaction quality, might suggest that unrecognized educational services offer a less appropriate context for what CLASS Pre-K considers to be quality educational practices.

It should also be noted that the stronger predictive power of training on assessment practices is consistent with studies reporting a significant influence of in-service training on child development and interaction quality (Ciesielski & Creaghead, 2020; Egert et al., 2018; Jensen & Rasmussen, 2019), but that the small number of participants who chose this option raises questions about the real impact of this variable. Considering that observed levels of Instructional Support quality are low, a finding regularly noted internationally (Organisation for Economic Cooperation and Development, 2021), it appears as a promising avenue for future studies.

In ECC, the positive influence of English as a native language on Classroom Organization scores suggests the influence of a third variable, that of culture. The conception of what constitutes quality interactions with children could indeed depend on one's culture of origin (Samuelsson et al., 2006; Sheridan, 2009; Tobin, 2005), tending to favour one aspect or another to support child development, such as autonomy or warm supervision. We hypothesize that initial training of these English-speaking educators is more centred on the CLASS model, an American English-speaking model to which they would have better access during their training. The negative association of the willingness to stay 2–5 years at the current job with Classroom Organization scores is also consistent with recent studies on burnout (Baert et al., 2020; Bigras & Lemay, 2020; Roberts et al., 2019), which translates into poorer quality relationships with children, whether due to lack of energy or appropriate resources for group management. However, further studies are needed to confirm the link between the desire to stay in one's job and the quality of adult interactions with children, given the weak predictive power of this variable in the present study, involving 7 respondents.

The result that remains the most unexpected in this study concerns the negative and predictive association with an early childcare specialized degree. It adds to the mixed body of literature on the impact of initial training on interaction quality (Colwell et al., 2013; Montie et al., 2006; Slot, 2018) and suggests that those with initial training in the early childhood field tend to have a humanist profile, leading to pedagogical practices that place little value on direct adult intervention (De Kraker-Pauw et al., 2017). However, other hypotheses are also possible. In particular, the understanding of what constitutes high quality Instructional Support among educators, derived from initial training, may not be consistent with the definition used by the CLASS Pre-K. Other studies have also pointed to the high sensitivity of CLASS scores to activity context (e.g., free play, snack, directed activity), which may have had an effect in this study. Further research is needed to shed light on these different avenues.

4.3 Links Between Results and the Ecosystemic Model of Quality in Educational Services

Despite these predictors, regression models in the present study explained only 16.4% to 45.7% of observed variance in interaction quality. We can therefore see that other variables could explain observed variations, particularly for the Emotional Support domain in 4-year-old preschools, for which no predictive variable could be identified. This finding underlines the value of using the ecosystemic model of quality (Bigras et al., 2020), to

fully understand the interrelationships between variables, but also between different systems, in order to obtain a complete picture of what supports children's development.

With regard to the microsystem, which was the focus of this study, three observations can be made. In terms of interaction quality, aside from Instructional Support quality, levels of quality are relatively high in 4-year-old preschools and ECC. In this respect, we hypothesize that 4-year-old Quebec children attending 4-year-old preschools and ECC are supported in their educational success, as interaction quality is highly predictive of this success (Sabol et al., 2013).

In terms of structural quality, previous studies have shown mixed results regarding a link with child development (Slot, 2018). In the present study, structural variables showed little impact on interaction quality, possibly due to a lack of statistical power. However, these results contribute to increasing the corpus of mixed effects and question the role of structural quality in the ecosystemic model of quality, as well as its effects on interaction quality. A graphical representation showing a partial effect between structural quality and interaction quality, such as a dotted arrow (see Figure 4), could better illustrate the reality of early childhood education and care services within the ecosystemic model of educational quality.

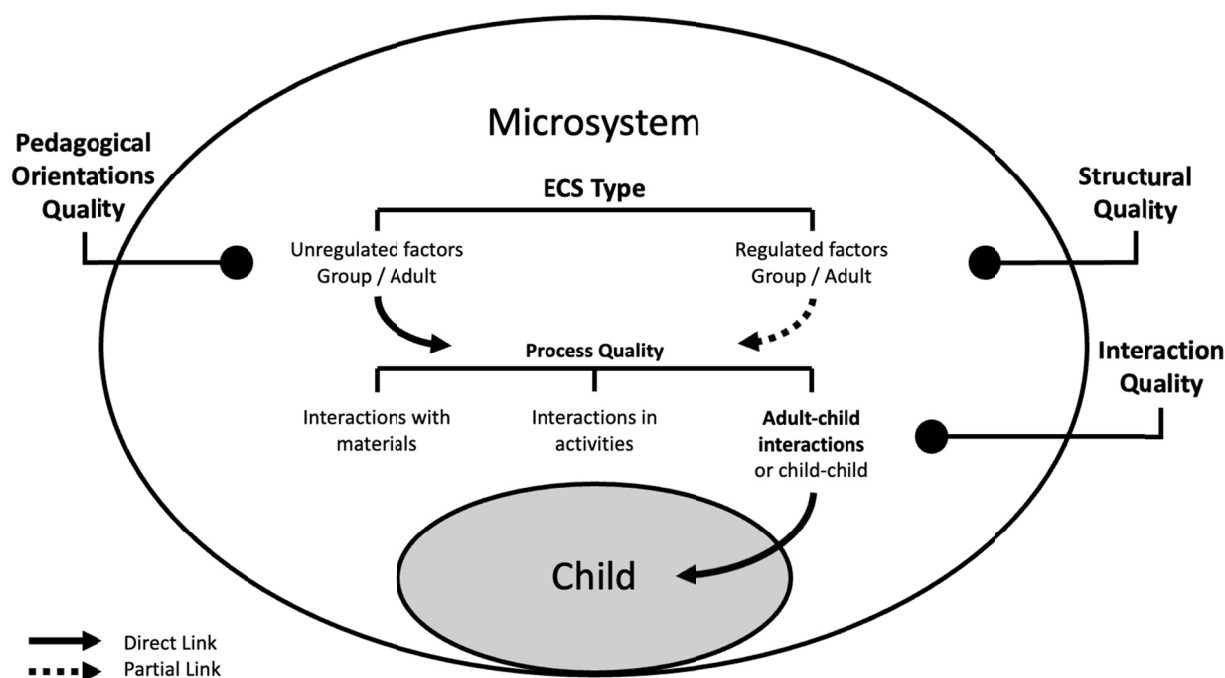


Figure 1. Adjusted hierarchical representation within the microsystem

Regarding pedagogical orientation quality, only three questions addressed this aspect of educational quality, namely the length of time participants wished to remain in their jobs, as well as the aspects most appreciated and those representing a challenge in their profession. Considering that these are qualitative results that are difficult to link to statistical analyses, and that structural quality variables do little to explain variations in interaction quality, we can raise the hypothesis that further exploration of this aspect of educational quality might better contribute to the prediction of interaction quality scores. This points to future studies to better understand this area of research and support the presence of multiple interactions to further explain the development of the child attending early childhood education and care services.

5. Conclusion

Considering the importance of early learning experiences on a child's educational success, it seems essential to ensure access to quality ECC worldwide, particularly as a protective factor to support children from disadvantaged backgrounds who are more likely to experience risk factors in their early years. It's important to note that the results of this study paint an encouraging picture of educational quality in early childhood education

and care services offered to 4-year-olds in Quebec. Although there is room for improvement in terms of Instructional Support, it is reassuring to note that the educational contexts of ECC and 4-year-old preschools offer equivalent interaction quality scores, which the literature suggests are likely to support children's development and educational success.

Both in Quebec and elsewhere, educational services for children are provided by people who are sensitive and attentive to the needs of children. It therefore seems important to offer them the necessary support so that they can carry out their educational role successfully. Results of the study reveal challenges regarding children with special needs, lack of resources and time, educational differentiation, as well as the instability of staff who work with 4-year-old children. In a post-pandemic context, considering the increasingly marked professional burnout in early childhood education and care services, we must reiterate the urgency of supporting these educators and teachers who take care of the youngest children in our society. The ecosystemic model of educational quality maintains that a complete set of factors contribute to child development. It is therefore just as important to put in place public policies that support the work of teachers and educators as it is to improve educational practices directly in the communities.

5.1 Study Limitations and Strengths

This study contributes to our knowledge of interaction quality in two educational contexts within the same culture. It does, however, have certain limitations. Although a sample of 90 participants is sufficient to obtain adequate statistical power for analyses related to the research objectives, the separation into two groups for correlational and regression analyses reduced the statistical power of analyses, limiting the interpretability of results. Sample recruitment in the Greater Montreal area, as well as in a few outlying sectors (South Shore and North Shore), resulted in a sample drawn from an urban context. We should also mention the difference observed in the level of material disadvantage between the two groups, which may have favoured ECC with more resources to support educators in their duties and influence interaction quality. Finally, it should be noted that the present study took place in a particular context of COVID-19 pandemic, the particularities of which (e.g., physical distancing, observation of masked people, non-representative professional development in the last 12 months) may influence results. They should therefore be interpreted with caution.

Yet the study also stands out for its strengths. Firstly, the study's methodology was based on measurement instruments whose validity had already been demonstrated. This means that our research results are robust. Secondly, the sample size ranks among the largest Quebec research studies on educational quality, excluding national studies, which increases the generalizability of the results. Finally, the study makes a major contribution to the body of knowledge on educational quality in Quebec's early childhood education and care services. Its uniqueness lies in the fact that, for the first time, it compares educational quality in ECC and 4-year-old preschools.

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