

Title: Quality of the Literacy Environment in Quebec Preschool and Kindergarten Classrooms and Children's Engagement

Julie Lachapelle, M.A.
Université du Québec à Montréal

Annie Charron, Ph.D.
Université du Québec à Montréal

Nathalie Bigras, Ph.D.
Université du Québec à Montréal

Abstract

This research examined the associations between classroom literacy environment and children's engagement in preschool and kindergarten in Quebec (Canada). A sample of 30 teachers and 150 children participated. The quality of the literacy environment and children's engagement was directly observed in the classroom setting. The classroom literacy environment was generally considered basic, while children's engagement was in the low range regarding interactions with the teachers, peers, and conflict interactions, and in the medium range for task orientation. There were no significant associations found between classroom literacy environment variables and children's engagement, but some control variables (specifically socioeconomic status, child age, and group size) were significantly related to dimensions of children's engagement. Results are discussed in relation to recent research.

Key words: Early Literacy; Child Engagement; Classroom Environment; Preschool; Kindergarten

Résumé

Cette étude analyse les relations entre l'environnement éducatif relatif à l'émergence de l'écrit et l'engagement des enfants à l'éducation préscolaire au Québec (Canada). Trente (30) enseignantes et 150 enfants ont participé à l'étude. La qualité de l'environnement éducatif et l'engagement des enfants ont été directement observés en classe. La qualité de l'environnement éducatif est généralement considérée de base, tandis que l'engagement des enfants se situe à un niveau faible en ce qui concerne les interactions avec les enseignantes, les pairs et les interactions négatives, et d'un niveau moyen pour ce qui est de l'orientation envers la tâche. Aucune association significative n'a été trouvée entre les variables de l'environnement éducatif et l'engagement des enfants, mais certaines variables de contrôle (en particulier le statut socio-économique, l'âge de l'enfant et la taille du groupe) s'avèrent significativement associées à certaines dimensions de l'engagement des enfants. Les résultats sont discutés en relation avec les recherches récentes.

Mots-clés : émergence de l'écrit; engagement de l'enfant; environnement éducatif; maternelle; préscolaire

1. Objectives

This study examined associations between classroom literacy environment and children's engagement in preschool and kindergarten in Quebec (Canada). As research shows increasing interest in children's engagement, it is important to build knowledge regarding the literacy environment quality and children's interactions considering the importance of language development in preventing later reading and writing difficulties and thus contributing to school readiness (Duncan et al., 2007). This research has 3 objectives: 1) Assess the quality of classroom literacy environment in preschool and kindergarten; 2) Assess children's level of engagement in emergent literacy development and learning contexts; 3) Analyze the relationships between the quality of the literacy environment and children's level of engagement.

2. Perspectives and theoretical framework

As part of the emergent literacy perspective, oral language, reading, and writing are generally considered interrelated processes observed during early childhood (Morrow et al., 2019). In preschool and kindergarten settings, children's behaviors and experiences are now recognized as paving the way to formal literacy learning (Drainville et al., 2020). The different contexts in which children evolve through social and practical experiences, including their classroom literacy environment, are also important elements of this process (Rohde, 2015). Recent research shows the literacy environment quality in preschool and kindergartens to be generally basic at best (Charron et al., 2022; Cunningham, 2010; Piasta et al., 2019; Zhang & Cook, 2019), which raises concerns since teacher support and the availability of a variety of written materials foster children's experiences related to oral language and early literacy learning (Dynia et al., 2018). Indeed, it is through quality educational practices that the classroom literacy environment supports children's engagement in emergent literacy (Baroody & Diamond, 2016).

Children's engagement refers to their interactions with the teacher, peers and their involvement within tasks and activities (Bohlmann et al., 2019; Downer et al., 2010). The quality of these interactions plays an essential role in emergent literacy, predicting school adjustment over and above the general quality of the classroom's relational environment (Sabol et al., 2018; Williford et al., 2013). Despite these findings, engagement in early childhood education is a relatively new construct and warrants more research to better understand its impact on children's classroom experiences (Author, 2021b; Breton, 2020). Furthermore, little research has specifically examined the associations between the classroom literacy environment and children's engagement (Baroody & Diamond, 2016; Norling et al., 2015).

3. Methods

A correlational design (Creswell & Guetterman, 2019; Duval et al, 2021) was used to determine if variables related to the classroom literacy environment were associated with variables related to children's engagement in preschool and kindergarten classrooms in Quebec (Canada). Direct classroom observational tools were used to collect data.

Classroom literacy environment

To assess the classroom literacy environment, observations were conducted with the Early Language and Literacy Classroom Observation Pre-K (ELLCO Pre-K; Smith et al., 2008). The ELLCO Pre-K includes 19 items rated on a 5-level Likert-type scale (1 = "deficient"; 2 = "inadequate"; 3 = "basic"; 4 = "adequate" and 5 = "exemplary"). These items are divided into five categories: a) Classroom Structure (4 items), b) Curriculum (3 items), c) Language Environment (4 items), d) Books and Book Reading (5 items), and e) Print and Early Writing (3 items) (see Table 1). The internal consistency ($\alpha = .90$) of the ELLCO Pre-K is considered very good (Taber, 2018).

Regarding the physical environment, a complementary checklist to the ELLCO Pre-K tool was used to collect additional data regarding areas and materials related to oral language, reading and writing. It consists of 23 items divided into 5 categories: a) Book Area (3 items); b) Book Selection (5 items); c) Book Use (2 items); d) Writing Materials (6 items) and e) Writing around the room (7 items). The 23 items were grouped into 2 subscales: 1) Reading (10 items) and 2) Writing (13 items).

Trained ELLCO Pre-K observers were present for a 3-hour observation period in the morning assigning scores to all 19 items and assessing the physical environment using the 23-item checklist.

Child engagement

Child engagement was assessed using the Individualized Classroom Assessment Scoring System (inCLASS; Downer et al., 2010). The inCLASS measures levels of engagement of children aged 3 to 5 and regarding four domains and ten dimensions (Teacher Interactions, including Positive Engagement and Teacher Communication; Peer Interactions, including Sociability, Communication, Assertiveness; Task Orientation, including Task Engagement and Self-Reliance; and Conflict Interactions, including Teacher Conflict, Peer Conflict and Behavioral Control (reversely scored) (see Table 2 for a description of each

dimension). The internal consistency of the four domains ($\alpha = 0,72$) is considered acceptable (Taber, 2018).

A 2.5 to 3-hour observation period was scheduled in the morning. Two trained observers were present and observed a total of 5 children during the same observation period. Each child was observed for a total of 4 cycles (10 minutes observing, 5 minutes coding). Scores were assigned to each dimension based on the presence of specific behavioral markers using a 7-point rating scale: low (1-2), medium (3-5), and high (6-7) range to assess children's level of engagement.

Data analysis

With regard to the first and second objectives of this study, descriptive statistics (means and standard errors) for the ELLCO Pre-K and inCLASS scores were calculated to assess the classroom literacy environment et children's level of engagement.

Due to the hierarchical nature of the data where children (level 1) were nested within classrooms (level 2), multilevel modeling was chosen as the data analytic strategy. Tabachnick and Fidell (2019) recommend having a sample size of 20 groups or larger at level 2. In the present study, there were 30 groups and 150 children. The study group was relatively small but acceptable for multilevel modeling. To examine the presence of potential associations between the classroom literacy environment and children's engagement, a multilevel analysis with random intercept was performed in R (R Core Team, 2021), using the *lme4* (Bates et al., 2015) and *lmerTest* (Kuznetsova et al., 2017) libraries. There was no missing data in the database for these analyses.

4. Data sources

Invitation letters were sent to 12 school boards in the Montreal area, 8 of which accepted to participate in this study. A letter of consent was sent to the voluntary teachers and to the parents of all children from their class. A convenience sample consisting of 7 preschool, 23 kindergarten teachers and 5 children randomly selected in each class was selected for this study. Teachers ($N = 30$) were all women, most often had a bachelor's degree or higher (86.6%) and had an average of 17.04 years of teaching experience. In all, 150 children (M age = 69.73 months; 50% girls) participated in the study and attended schools in the Montreal (Quebec) area. The majority (74.7%) had French as their mother tongue. Data was collected from February to June 2022.

5. Results and substantiated conclusions

Descriptive statistics for ELLCO Pre-K scores are presented in Table 3. The presence of multicollinearity was detected between Curriculum and Books and Book Reading, as verified with a VIF value greater than 3. In order to retain sufficient detail in our analyses, it was decided to use the mean of these two domains to create a new variable (Curriculum and Books and Book Reading – combined). Results show that ELLCO Pre-K scores indicate “basic” quality for Curriculum, Language Environment, Books and Book Reading, Print and Early Writing, and Curriculum/Books and Book Reading (combined); only Classroom Structure achieves a “strong” rating.

Descriptive statistics and intraclass correlations (ICC) for the inCLASS scores are presented in Table 4. When averaged across all four cycles of observation, child-level results regarding engagement indicate that Teacher Interactions and Peer Interactions were predominantly low quality but evidenced little to no Conflict Interactions. On the other hand, Task Orientation reached a medium-level of quality.

Bivariate correlations among variables can be found in Table 5 and regression models for ELLCO Pre-K variables, inCLASS variables and control variables can be found in Table 6.

Regression models show that classroom literacy environment variables as measured by the ELLCO Pre-K were not significantly related to children’s engagement as measured by the inCLASS. These findings might be due to the sample size of this study and/or mediating and moderating effects of other variables. As for control variables, SES ($\beta = .02, p < .05$) was found to be significantly related to Teacher Interactions while Group Size ($\beta = .07, p < .05$) was significantly related to Peer Interactions. Also, Child Age ($\beta = .02, p < .05$) was significantly related to Task Orientation and Group Size ($\beta = .32, p < .05$) was significantly related to Conflict Interactions.

The results of this study add to the growing body of work indicating that the classroom literacy environment quality, when assessed with the ELLCO Pre-K, generally remains in the “basic” range for Classroom Structure, Curriculum, Language Environment and Books and Book Reading, while Print and Early Writing often fall in the “inadequate” range (Arteaga et al., 2019; Barker et al., 2021; Charron et al., 2022; Landry et al., 2021; Zhang et al., 2019). These levels are considered insufficient to support children's development, particularly in disadvantaged settings where children benefit even more from high quality classroom literacy practices (Justice et al., 2008).

Regarding generally low levels of engagement observed for Teacher Interactions, Peer Interactions, and Conflict Interactions, as well as medium-range levels for Task Orientation, these findings are consistent with other studies (Ramirez & Linberg, 2021; Roy-Vallières et al., 2022; Slot & Bleses, 2018; Smidt & Embacher, 2021; Yang et al., 2022). This suggests children may be more engaged towards tasks and activities than people, as social skills take longer to develop during early childhood (Roy-Vallières et al., 2022). Furthermore, engagement has been shown to be highly sensitive to classroom contexts which might provide insight regarding the absence of significant associations between ELLCO Pre-K variables and inCLASS variables. For example, teacher-led activities, such as scaffolding, that are considered high quality by observation tools like the ELLCO Pre-K, are negatively related to Peer Interactions (Smidt & Embacher, 2020) and Task Orientation (Vitiello et Williford, 2020). On the other hand, free play, during which teachers tend to be less actively involved, is associated with higher Peer Interactions (Yoder et al., 2019) and Task Orientation (Vitiello et Williford, 2020).

As for SES, children from more advantaged backgrounds are more likely to develop positive social skills with adults and peers (Hosokawa et al., 2017), perhaps explaining the positive effect of SES background on the quality of children's interactions with their teacher. Child age seems to play a role in engagement levels, as engagement is differentiated as children get older (McWilliam & Casey, 2008), potentially explaining their capacity to stay on task. Finally, Group Size may represent a potential influence on the interaction quality in preschools (Ramirez et Linberg, 2021; Smidt & Embacher, 2020) as it may be a factor in the number and range of opportunities for peer interactions but also for potential conflicts that can occur within preschool and kindergarten settings.

6. Scientific or scholarly significance of the study or the work

As both classroom literacy environment and children's engagement contribute to children's learning and school readiness, it is essential to gather knowledge on these aspects of their classroom experience (Bohlmann & Downer, 2016; Williford et al., 2013). Findings from this study highlight the need to support teachers' professional development in order to improve the quality of the classroom literacy environment and thus foster children's emergent literacy. In addition, it is important to study the contexts that would sustain higher levels of engagement in the classroom, particularly factors that would improve the quality of children's interactions with adults and peers. Although the more exploratory portion of this study did not find significant associations between ELLCO Pre-K and inCLASS scores, it is possible that links do

exist between these classroom and child-level variables. Since it was, to our knowledge, the first time these observational tools were used in the same study, more research is warranted to better understand how factors related to the classroom literacy environment can influence children's engagement.

Table 1.

Structure of the ELLCO Pre-K

General Classroom Environment

Section I. Classroom Structure

Item 1. Organization of the Classroom

Item 2. Contents of the Classroom

Item 3. Classroom Management

Item 4. Personnel

Section II. Curriculum

Item 5. Approaches to Curriculum

Item 6. Opportunities for Child Choice and Initiatives

Item 7. Recognizing Diversity in the Classroom

Language and Literacy

Section III. Language Environment

Item 8. Discourse Climate

Item 9. Opportunities for Extended Conversations

Item 10. Efforts to Build Vocabulary

Item 11. Phonological Awareness

Section IV. Books and Book Reading

Item 12. Organization of Book Area

Item 13. Characteristics of Books

Item 14. Books for Learning

Item 15. Approaches to Book Reading

Item 16. Quality of Book Reading

Section V. Print and Early Writing

Item 17. Quality of Book Reading

Item 18. Support for Children's Writing

Item 19. Environmental Print

Table 2.

Domains and dimensions of the inCLASS (Bohlmann et al., 2019; Downer et al., 2010)

Domains	Dimensions	Description
Teacher Interactions	Positive Engagement	Child's level of emotional engagement with the adult, including seeking and enjoying interactions with the adult
	Teacher Communication	Child to adult verbal communication initiatives, conversation maintenance and functional use of language for a variety of communication purposes
Peer Interactions	Peer Sociability	Evidence of positive emotions and behaviors, including proximity and interaction seeking, social awareness, and positive peer response
	Peer Communication	Child's verbal communication initiatives toward peers, maintaining conversations, and functional use of language for a variety of communication purposes
	Peer Assertiveness	Use of positive strategies to initiate and demonstrate leadership in peer interactions
Task Orientation	Task Engagement	Consistent and active involvement of the child in the activities, including time spent on the activities and level of enthusiasm
	Self-Reliance	Child taking learning into his/her own hands, including his/her sense of initiative
Conflict Interactions	Teacher Conflict	Interactions with teachers characterized by tension, resistance and negativity
	Peer Conflict	Interactions with peers characterized by tension, resistance and negativity
	Behavior Control (rev)	Adherence to situational behavioral expectations, including demonstrations of patience and body awareness in space

Table 3.

Descriptive statistics of classroom level variables

Classroom level variables			
	<i>Mean</i>	<i>SE</i>	
ELLCO Pre-K scores			
Classroom Structure	3.65	0.72	
Curriculum	2.91	0.86	
Language Environment	3.38	0.73	
Books and Book Reading	3.37	0.72	
Print and Early Writing	2.9	0.87	
Curriculum/Books and Book Reading (combined)	3.14	0.77	
Control variables			
Overall teaching experience	17.2	6.38	
Preschool/kindergarten teaching experience	13.3	6.5	
Group size	15.93	2.46	
Socioeconomic status (SES)	20.8	13.63	
SES rank 1-10	7.37	2.91	
Low-income threshold (LIT)	11.97	6.8	
LIT rank 1-10	6.9	2.58	
Physical environment - reading	0.61	0.21	
Physical environment - writing	0.35	0.18	

Note. $N = 30$

Table 4.

Descriptive statistics of level 1 variables

Child level variables			
	<i>Mean</i>	<i>SE</i>	<i>ICC</i>
inCLASS scores			
Teacher Interactions	2.43	0.63	0.178
Peer Interactions	2.82	0.73	0.086
Task Orientation	4.49	0.68	0.024
Conflictual Interactions	1.32	0.35	<u>0.239</u>
Child Age	69.73	6.44	

Note. $N = 150$ (75 girls)

Table 5.

Bivariate correlations for study variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Teacher Interactions																				
2. Peer Interactions	.02																			
3. Task Orientation	.31***	.35***																		
4. Conflictual Interactions	-.13	.29***	-.17*																	
5. Child age	.00	.07	.16	.01																
6. Classroom Structure	.05	-.12	.10	-.03	.22**															
7. Curriculum	.10	-.19*	.08	.01	.13	.61***														
8. Language Environment	.05	-.17	.16	-.16	.16	.53***	.61***													
9. Books and Book Reading	.14	-.21**	.08	.01	.14	.62***	.89***	.53***												
10. Print and Early Writing	.07	-.24**	.03	.03	.22**	.47***	.69***	.58***	.67***											
11. Curriculum/Books & Book Reading (mean)	.12	-.20*	.08	.01	.14	.63***	.98***	.59***	.97***	.70***										
12. Overall Teaching Experience	.13	-.01	.01	-.12	.00	.00	.12	.17*	.08	.10	.10									
13. Preschool/Kindergarten Teaching Experience	.04	-.07	-.09	-.04	.06	.00	.10	.08	.09	.21*	.10	.77***								
14. Group Size	-.13	.18*	-.10	.23**	.34***	.21*	.26**	-.11	.27**	-.01	.27***	-.10	.02							
15. Socioeconomic status (SES)	.15	-.01	.03	.01	.06	-.33***	-.33***	-.12	-.24**	-.31***	-.30***	.07	.17*	-.17*						
16. SES rank 1-10	.07	.11	-.05	.18*	.15	-.33***	-.37***	-.20*	-.22**	-.31***	-.31***	.20*	.24**	.09	.82***					
17. Low-income threshold (LIT)	.05	.01	.01	-.01	-.09	-.31***	-.26**	-.21*	-.24**	-.35***	-.26***	.06	.11	-.14	.78***	.47***				
18. LIT rank 1-10	-.03	.00	-.11	.14	-.13	-.41***	-.36***	-.30***	-.30***	-.36***	-.34***	.19*	.16	-.08	.61***	.51***	.82***			
19. Physical Environment - Reading	.06	.08	.00	-.07	.00	-.19*	-.22**	-.22**	-.16	-.14	-.20***	-.06	-.12	.14	.01	.04	.02	.02		
20. Physical Environment - Writing	-.04	.07	-.06	-.02	-.13	-.47***	-.20*	-.35***	-.26**	-.18*	-.23***	-.22**	-.07	.04	.08	-.07	.27***	.16	.41***	
21. Child gender	.04	-.06	.04	-.07	-.03	-.03	.02	-.03	.02	-.04	.02	.04	.05	.07	.03	.05	.04	.03	.00	.04

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 6.

Regression models: inCLASS Domains, ELLCO Variables and Control Variables

	inCLASS domains							
	Teacher Interactions		Peer Interactions		Task Orientation		Conflict Interactions	
	<i>B</i> (<i>SE</i>)	β	<i>B</i> (<i>SE</i>)	β	<i>B</i> (<i>SE</i>)	β	<i>B</i> (<i>SE</i>)	β
(Intercept)	2.01(.90)*	-.05	2.11(.92)*	.08*	3.11(.82)***	.02	1.38(.54)*	.08
ELLCO variables								
Classroom Structure	.10(.15)	.11	-.02(.15)	-.02	.05(.13)	.05	-.04(.09)	-.08
Curriculum/Books and Book Reading	.28(.17)	.33	-.22(.17)	-.23	.15(.15)	.17	-.04(.10)	-.09
Language Environment	-.19(.14)	-.22	.04(.14)	.03	.09(.12)	.09	-.11(.08)	-.22
Print and Early Writing	-.00(.14)	-.01	-.09(.14)	-.11	-.14(.12)	-.18	.12(.08)	.29
Control variables								
Overall Teaching Experience	.03(.02)	.30	.02(.02)	.17	.01(.02)	.11	-.02(.22)	-.02
Preschool/Kindergarten Teaching Experience	-.02(.02)	-.23	-.02(.02)	-.16	-.02(.02)	-.17	-.10(.22)	-.10
Group Size	-.06(.04)	-.21	.07(.04)*	.24	-.06(.03)	-.21	.32(.15)*	.32
Child Gender	.06(.10)	.10	-.11(.12)	-.15	-.03(.11)	-.05	-.17(.15)	-.17
Socioeconomic status (SES)	.02(.01)*	.42	-.00(.02)	-.05	.00(.01)	0.01	.12(.22)	.12
Low-income threshold (LIT)	-.02(.02)	-.25	-.13(.38)	-.01	.00(.02)	.00	-.01(.21)	-.01
Physical Environment - Reading	.29(.37)	.10	-.13(.38)	-.04	.14(.33)	.04	-.13(.14)	-.13
Physical Environment - Writing	.20(.52)	.06	.18(.53)	.05	.13(.46)	.03	-.10(.17)	-.10
Child Age	.00(.01)	.02	.01(.01)	.06	.02(.01)*	.23	-.06(.11)	-.06(.11)
Random Effects								
σ^2	.34		.49		.45		.09	
τ_{00} Class_code	.06		.03		.01		.03	
Marginal R ² / Conditional R ²	.131/.267		.116/.171		.091/.115		.122/.337	

* $p < .05$. ** $p < .01$. *** $p < .001$.

References

- Arteaga, I., Thornburg, K., Darolia, R., & Hawks, J. (2019). Improving teacher practices with children under five: Experimental evidence from the Mississippi Buildings Blocks. *Evaluation Review*, 43(1-2), 41-76. <https://doi.org/10.1177/0193841X19865070>
- Barker, K. S., Kim, D.-H., & Pendergraft, E. (2021). “It felt good to be included”: A mixed-methods study of pre-kindergarten teachers’ experiences with professional learning. *Early Childhood Education Journal*. <https://doi.org/10.1007/s10643-021-01175-4>
- Baroody, A. E., & Diamond, K. E. (2016). Associations among preschool children’s classroom literacy environment, interest and engagement in literacy activities, and early reading skills. *Journal of Early Childhood Research*, 14(2), 146-162. <https://doi.org/10.1177/1476718X14529280>
- Bates, D., Mächler, M., Bolker, B., & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, 67(1), 1–48. <https://doi-org.proxy.bibliotheques.uqam.ca/10.18637/jss.v067.i01>
- Bohlmann, N. L., Downer, J. T., Williford, A. P., Maier, M. F., Booren, L. M., & Howes, C. (2019). Observing children’s engagement: examining factorial validity of the inCLASS across demographic groups. *Journal of Applied Developmental Psychology*, 60, 166-176. <https://doi.org/10.1016/j.appdev.2018.08.007>
- Breton, N. (2020). *Dynamiques interactionnelles à l’éducation préscolaire cinq ans : Étude des liens réciproques entre la qualité du soutien émotionnel et l’engagement de l’enfant envers son enseignante et ses pairs en classe* [Doctoral dissertation, Université Laval]. CorpusUL. <https://corpus.ulaval.ca/jspui/bitstream/20.500.11794/66303/1/35915.pdf>
- Charron, A., April, J., Bigras, N., Bouchard, C., Gagné, A., Duval, S., Lehrer, J., Lemay, L. et Turgeon, E. (2022). *Qualité de l’environnement oral et écrit et qualité des interactions dans des classes de maternelle quatre ans à temps plein en milieu défavorisé : les effets sur le développement du langage oral et écrit des enfants de quatre ans*. Fonds de recherche du Québec – Société et culture. <https://frq.gouv.qc.ca/histoire-et-rapport/qualite-de-lenvironnement-oral-et-ecrit-et-qualite-des-interactions-dans-des-classes-de-maternelle-quatre-ans-a-temps-plein-en-milieu-defavorise-les-effets-sur-le-developpement-du-langage-o/>
- Creswell, J. W., & Guetterman, T. C. (2019). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (6th ed.). Pearson.
- Cunningham, D. D. (2010). Relating preschool quality to children’s literacy development. *Early Childhood Education Journal*, 37(6), 501-507. <https://doi.org/10.1007/s10643-009-0370-8>
- Downer, J. T., Booren, L. M., Lima, O. K., Luckner, A. E., & Pianta, R. C. (2010). The Individualized Classroom Assessment Scoring System (inCLASS): Preliminary reliability and validity of a system for observing preschoolers’ competence in classroom interactions. *Early Childhood Research Quarterly*, 25(1), 1-16. <https://doi.org/10.1016/j.ecresq.2009.08.004>
- Drainville, R., Dumais, C., & Marinova, K. (2020). Apprentissage du langage écrit à l’éducation préscolaire : Survol des approches éducatives et des perspectives théoriques de 1920 à 2020. *Revue internationale de communication et de socialisation*, 7(1), 53-74.

- Duval, S., Montminy, N., & Bigras, N. (2021). Les recherches corrélationnelles. In J. Lehrer, N. Bigras, A. Charron, & I. Laurin (Eds.), *La recherche en éducation à la petite enfance : origines, méthodes et applications* (p. 85-121). Presses de l'Université du Québec.
- Dynia, J. M., Schachter, R. E., Piasta, S. B., Justice, L. M., O'Connell, A. A., & Yeager Pelatti, C. (2018). An empirical investigation of the dimensionality of the physical literacy environment in early childhood classrooms. *Journal of Early Childhood Literacy*, 18(2), 239-263. <https://doi.org/10.1177/1468798416652448>
- Justice, L. M., Mashburn, A. J., Hamre, B. K., & Pianta, R. C. (2008). Quality of language and literacy instruction in preschool classrooms serving at-risk pupils. *Early Childhood Research Quarterly*, 23(1), 51-68. <https://doi.org/10.1016/j.ecresq.2007.09.004>
- Kuznetsova, Alexandra, Per B. Brockhoff, and Rune H. B. Christensen. 2017. lmerTest package: tests in linear mixed effects models. *Journal of Statistical Software* 82(13), 1–26. <https://doi.org/10.18637/jss.v082.i13>.
- Lachapelle, J., Charron, A., & Bigras, N. (2021). L'engagement de l'enfant au regard de ses apprentissages et de son développement à l'éducation préscolaire. *Canadian Journal for New Scholars in Education/ Revue canadienne des jeunes chercheurs et chercheurs en éducation*, 12(1), 62-70.
- Landry, S. H., Zucker, T. A., Montroy, J. J., Hsu, H.-Y., Assel, M. A., Varghese, C., Crawford, A., & Feil, E. G. (2021). Replication of combined school readiness interventions for teachers and parents of head start pre-kindergarteners using remote delivery. *Early Childhood Research Quarterly*, 56, 149-166. <https://doi.org/10.1016/j.ecresq.2021.03.007>
- McWilliam, R. A., & Casey, A. M. (2008). *Engagement of every child in the preschool classroom*. Paul H. Brookes.
- Morrow, L. M., Dougherty, S. M., & Tracey, D. H. (2019). Best practices in early literacy. In L. M. Morrow & L. B. Gambrell (Eds.), *Best practices in literacy instruction* (6th ed., p. 75-103). The Guilford Press.
- Norling, M., Sandberg, A., & Almqvist, L. (2015). Engagement and emergent literacy practices in Swedish preschools. *European Early Childhood Education Research Journal*, 23(5), 619-634. <https://doi.org/10.1080/1350293X.2014.996423>
- Piasta, S. B., Park, S., Farley, K. S., Justice, L. M., & O'Connell, A. A. (2019). Early childhood educators' knowledge about language and literacy: Associations with practice and children's learning. *Dyslexia*, 26(2), 137-152. <https://doi.org/10.1002/dys.1612>
- Ramirez, M., & Linberg, A. (2021). Child-specific interaction quality at the first and last year of preschool and its relationship to preschool, child, and family characteristics – an empirical perspective using the inCLASS. *Early Child Development and Care*, 1-15. <https://doi.org/10.1080/03004430.2021.1950703>
- R Core Team. (2021). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. <https://www.R-project.org/>
- Rohde, L. (2015). The Comprehensive Emergent Literacy Model: Early literacy in context. *SAGE Open*, 5(1), 1-11. <https://doi.org/10.1177/2158244015577664>

- Roy-Vallières, M., Lachapelle, J., Lemay, L., Bouchard, C., & Bigras, N. (2022). Children's engagement in Quebec childcare centres: Progression from 3 to 5 years old and predictor variables. *Early Child Development and Care*. <https://doi.org/10.1080/03004430.2022.2042279>
- Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2019). *Using multivariate statistics* (7th edition). Pearson.
- Sabol, T., Bohlmann, N., & Downer, J. (2018). Low-income ethnically diverse children's engagement as a predictor of school readiness above preschool classroom quality. *Child development*, 89(2), 556-576. <https://doi.org/10.1111/cdev.12832>
- Slot, P. L., & Bleses, D. (2018). Individual children's interactions with teachers, peers, and tasks: The applicability of the inCLASS Pre-K in Danish preschools. *Learning and Individual Differences*, 61, 68-76. <https://doi.org/10.1016/j.lindif.2017.11.003>
- Smidt, W., & Embacher, E.-M. (2021). Examining the factorial validity of the Individualized Classroom Assessment Scoring System in preschools in Austria. *International Journal of Early Years Education*. <https://doi.org/10.1080/09669760.2021.1893158>
- Smith, M. W., Brady, J. P., & Anastasopoulos, L. (2008). *Early language and literacy classroom observation: Pre-K tool*. Paul H. Brookes.
- Taber, K.S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Res Sci Educ*, 48, 1273–1296.
- Vitiello, V. E., & Williford, A. P. (2020). Context influences on task orientation among preschoolers who display disruptive behavior problems. *Early Childhood Research Quarterly*, 51, 256-266. <https://doi.org/10.1016/j.ecresq.2019.09.004>
- Williford, A. P., Maier, M. F., Downer, J. T., Pianta, R. C., & Howes, C. (2013). Understanding how children's engagement and teachers' interactions combine to predict school readiness. *Journal of Applied Developmental Psychology*, 34(6), 299-309. <https://doi.org/10.1016/j.appdev.2013.05.002>
- Yang, Q., Bartholomew, C. P., Ansari, A., & Purtell, K. M. (2022). Classroom age composition and preschoolers' language and literacy gains: The role of classroom engagement. *Early Childhood Research Quarterly*, 60, 49-58. <https://doi.org/10.1016/j.ecresq.2022.01.001>
- Yoder, M. L., Williford, A. P., & Vitiello, V. E. (2019). Observed quality of classroom peer engagement in a sample of preschoolers displaying disruptive behaviors. *Early Childhood Research Quarterly*, 47, 206-217. <https://doi.org/10.1016/j.ecresq.2018.12.011>
- Zhang, C., & Cook, J. C. (2019). A reflective professional development intervention model of early writing instruction. *Journal of Early Childhood Teacher Education*, 40(2), 177-196. <https://doi.org/10.1080/10901027.2018.1536903>