Mediation or Moderation? Mechanisms Through Which Quantity, Type and Quality of Childcare Influence Children's Externalising and Internalising Behaviours

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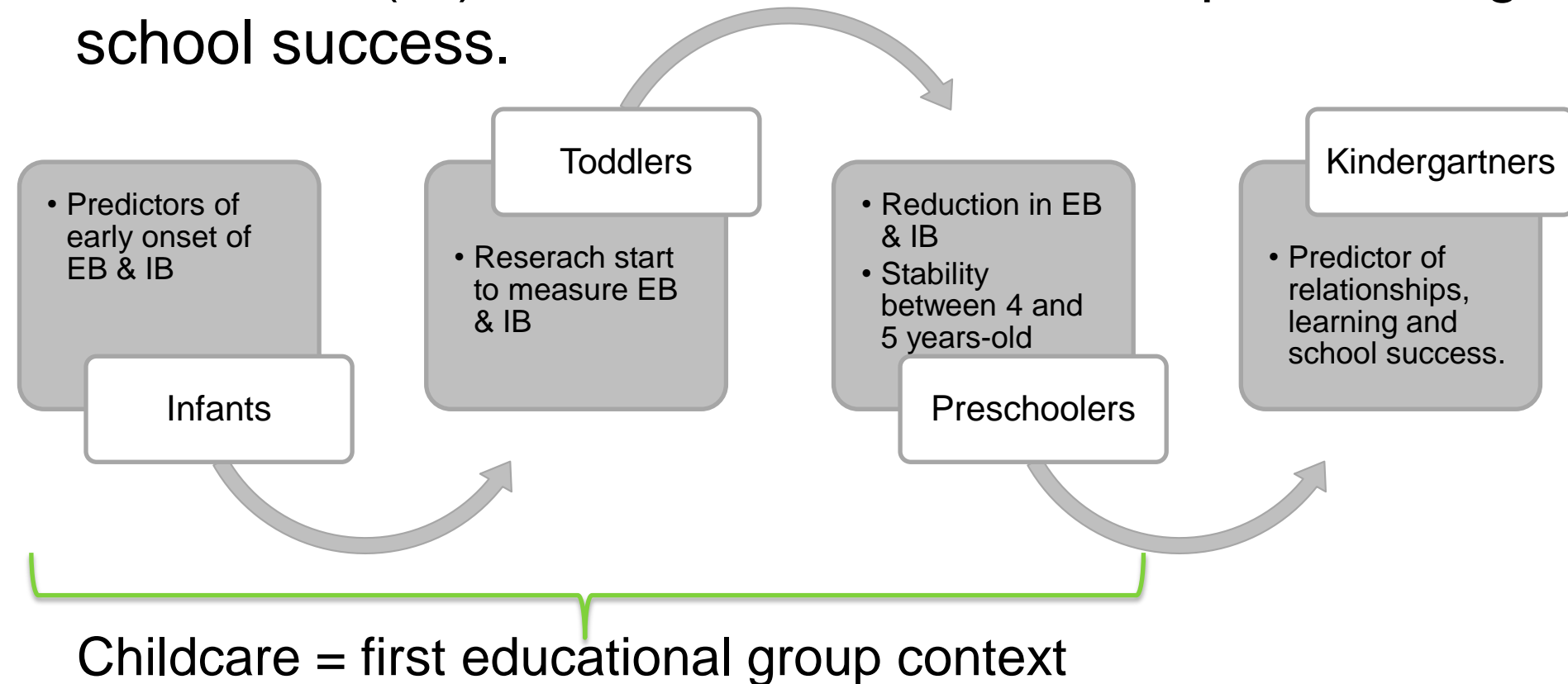[1] Université du Québec à Montréal, Faculté des sciences de l'éducation, Département de didactique
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In educational context….

- Appropriate behaviours = adaptation;
- Externalising behaviours (EB) & internalising behaviours(IB) = interfere with relationships, learning, school success.

Infants
- Predictors of early onset of EB & IB

Toddlers
- Reserach start to measure EB & IB

Preschoolers
- Reduction in EB & IB
- Stability between 4 and 5 years-old

Kindergartners
- Predictor of relationships, learning and school success.

Childcare = first educational group context

Childcare attendance and behavioural outcomes

- Childcare attendance ≠ systematically fewer behavioural difficulties (Bigras et al., 2009; Lemay, Bigras, & Bouchard, 2012; Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007).

- Relationships are better understood when examining variables of the childcare experience:
  - Quantity
  - Type
  - Structural quality
  - Process quality
    (Jacob, 2009; Vandell, 2004)

What are the mechanisms through which quantity, type and quality of childcare influence children's EB and IB?

Theoretical framework

- Person-Process-Context-Time model (Bronfenbrenner, 2005).
  - Person: development and behaviours
  - Processes: direct experiences of the person (childcare process quality)
    - the organization of space and resources;
    - the content and nature of the program;
    - the nature of the interactions.
  - Context: structural variables, childcare type, social context, etc.
  - Time: amount of exposition to experiences

Theoretical framework

- Mechanisms through which childcare variables interact to influence child outcomes (Mashburn & Pianta, 2010):
  - process quality is the direct mechanism influencing child development (direct);
  - the influence of structural variables on children's development is indirect, through their direct influence on process quality (mediation);
  - structural variables determine the extent to which high process quality influences children's development (moderation).

Mediation and moderation were not explored simultaneously.

Research objectives

Explore the interactive influence of quantity, type, structural and process quality of care experienced in toddlerhood on children's EB and IB in preschool years.

Explore a mediation model.

Explore a moderation model.

H1: The association between quantity and type of care and EB and IB is mediated by process quality.

H2: The association between structural quality and EB and IB is mediated by process quality.

H3: The association between process quality and EB and IB is moderated by quantity and type of care.

H4: The association between process quality and EB and IB s is moderated by structural quality.
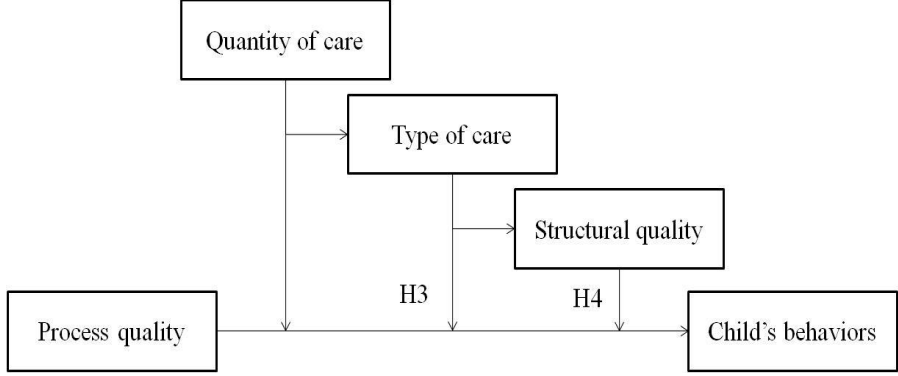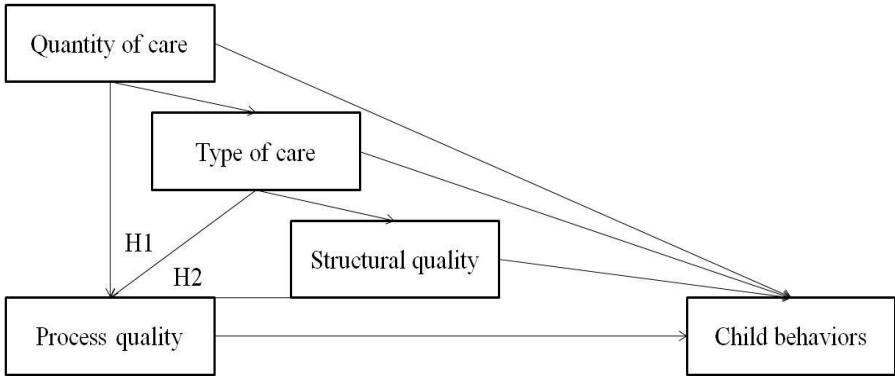
Methods

- **Sample**
  - 70 children (45 in center-based childcare; 25 in home-based childcare)
- **Measures**

	24 months	36 months
Outcomes		
Externalizing and internalizing behaviours (Achenbach, 1992)		O
Predictors		
Childcare experience (quantity, type) (Lemay & Bigras, 2006)	O	
Process quality (9 subdimensions) (Bourgon & Lavallée, 2004a, 2004b)	O	
Child-to-adult ratio, educator's initial and ongoing training (ISQ, 2003a, 2003b)	O	

- **Analyses**
  - Mediation and moderation hypothesis were planned to be tested in 8 regression analysis (Baron and Kenny, 1986).
  - Process quality subscales were explored one at the time (1:10).
  - Bonferronni correction compensated for multiple comparisons.

Educational Quality Observation Scales

Subscales	Description
Physical setting	
1.1 Space	Regulated elements related to the health and safety of children; flexibility and adequacy of the layout and furnishing for the needs and interests of children.
1.2 Material	Equipment and materials available; safety of the materials; diversity and characteristics of the materials to foster different domains of development.
Programming	
2.1 Planning	Adequacy of planning practices, flexibility of its application and the sources of inspiration utilized.
2.2 Observation	Periods of observation of children, tools used for observation and follow-up on observations.
2.3 Schedule	Sequence of activities during the day; organization of the group based on the children's needs.
2.4 Activities	Opportunity for children to choose their activities and play an active role in the activity they are involved in.
Interactions with children	
3.1 Play value	Educator's ability to observe and support children in their play.
3.2 Intervention	Educator's behaviors or attitudes that promote independence and cooperation among children and support them in their initiatives.
3.3 Communication	Stimulation and support of children's communication skills: verbal/nonverbal, listening, establishing positive relationships; educator intervention during times of difficult behavior.
4. Interactions with parents	Collaboration between educator and parents

Results – H1 & H2 mediation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Externalizing behaviors	---																
2. Internalizing behaviors	.62**	---															
3. Quantity	-.02	.05	---														
4. Type	.02	-.04	-.21	---													
5. Ratio	-.08	-.08	.02	-.45**	---												
6. Ongoing training	-.17	.07	.04	-.03	-.20	---											
7. Specialized degree	-.21	-.22	.23	-.14	-.03	.21	---										
8. Quality 1.1	-.02	.13	.17	-.57**	.47**	.05	.17	---									
9. Quality 1.2	.10	.12	.17	-.04	-.05	.36**	.17	.29**	---								
10. Quality 2.1	.14	.11	-.02	-.25*	.29*	.08	-.10	.21	.05	---							
11. Quality 2.2	.38**	.33**	.23	-.40**	.26*	.03	.03	.42**	.32**	.11	---						
12. Quality 2.3	-.09	.04	.13	-.42**	.20	.24	.07	.49**	.38**	.05	.37**	---					
13. Quality 2.4	-.07	.05	.13	-.40**	.21	.20	.09	.51**	.52**	.17	.36**	.60**	---				
14. Quality 3.1	.04	.08	.06	-.30*	.15	.14	.05	.39**	.54**	.01	.40**	.47**	.78**	---			
15. Quality 3.2	.00	.04	.17	-.51**	.23	.20	.13	.65**	.55**	.18	.47**	.61**	.70**	.68**	---		
16. Quality 3.3	-.11	-.08	.17	-.49**	.30*	.35**	.25	.58**	.53**	.10	.37**	.65**	.76**	.74**	.85**	---	
17. Quality 4	.15	.08	-.09	-.04	.06	.24	-.08	.16	.48**	.25**	.36**	.22	.17	.21	.36**	.30*	---

*Note * p < .05, ** p < .01, *** p < .001*

Results – H3 moderated by quantity and type

	Externalizing behaviors					Internalizing behaviors				
	B	SE	B	ΔR^2	R^2	B	SE	B	ΔR^2	R^2
Bloc 1				0.001	0.001				0.004	0.004
Quantity of care	-0.189	1.161	-0.020			0.403	1.148	0.044		
Type of care	0.211	2.406	0.011			-0.638	2.378	-0.033		
Bloc 2										
Quality 1.1	-0.187	1.391	-0.020	0.000	0.001	1.377	1.365	0.150	0.015	0.019
Quality 1.2	0.969	1.155	0.104	0.011	0.011	1.091	1.140	0.119	0.014	0.017
Quality 2.1	1.384	1.172	0.149	0.021	0.021	0.978	1.165	0.106	0.011	0.014
Quality 2.2	4.413	1.141	0.475	0.185**	0.185**	3.422	1.176	0.372	0.113**	0.117**
Quality 2.3	-0.969	1.256	-0.104	0.009	0.010	0.281	1.246	0.031	0.001	0.004
Quality 2.4	-0.651	1.244	-0.070	0.004	0.005	0.311	1.232	0.034	0.001	0.005
Quality 3.1	0.490	1.196	0.053	0.003	0.003	0.658	1.182	0.071	0.005	0.008
Quality 3.2	0.150	1.331	0.016	0.000	0.001	0.187	1.316	0.020	0.000	0.004
Quality 3.3	-1.301	1.307	-0.140	0.015	0.015	-1.285	1.292	-0.140	0.015	0.018
Quality 4	1.358	1.137	0.146	0.021	0.022	0.767	1.133	0.083	0.007	0.011
Bloc 4										
Quantity X Type X Quality 1.2	9.630	3.015	0.451	0.135**	0.176**	7.809	3.093	0.369	0.091[t]	0.118[t]
Quantity X Type X Quality 2.3	11.022	2.771	0.701	0.005**	0.236**	8.720	2.859	0.560	0.124**	0.170**
Quantity X Type X Quality 2.4	9.303	3.082	0.434	0.125**	0.150**	7.596	3.110	0.358	0.085[t]	0.117[t]
Quantity X Type X Quality 3.1	5.154	2.551	0.326	0.057[t]	0.139[t]	2.488	2.678	0.159	0.013	0.032
Quantity X Type X Quality 3.2	10.014	2.569	0.774	0.193**	0.211**	7.407	2.660	0.578	0.108**	0.137**
Quantity X Type X Quality 3.3	10.866	2.651	0.763	0.204**	0.247**	7.096	2.787	0.503	0.089[t]	0.152[t]

Note: [t] p-value > adjusted p-value with Bonferroni correction, ** p-value < adjusted p-value with Bonferroni correction

Results – H4 moderated by structural quality

	Externalizing behaviors (n=50)					Internalizing behaviors (n = 50)				
	B	SE	B	ΔR^2	R^2	B	SE	B	ΔR^2	R^2
Bloc 1				0.089	0.089				0.065	0.065
Group ratio	-1.113	1.407	-0.113			-0.018	1.434	-0.002		
Ongoing training	-2.244	2.798	-0.117			1.720	2.852	0.089		
Specialized degree	-4.877	2.990	-0.235			-5.374	3.048	-0.257		
Bloc 2										
Process Quality 1.1	1.064	1.477	0.118	0.010	0.099	2.570	1.465	0.284	0.060	0.124
Process Quality 1.2	1.798	1.485	0.181	0.029	0.118	1.577	1.521	0.158	0.022	0.086
Process Quality 2.1	2.592	1.260	0.298	0.078^{t}	0.167^{t}	2.313	1.298	0.264	0.062	0.126
Process Quality 2.2	3.968	1.272	0.419	0.162^{**}	0.251^{**}	3.668	1.322	0.385	0.137^{**}	0.201^{**}
Process Quality 2.3	0.565	1.557	0.057	0.003	0.091	1.791	1.566	0.179	0.026	0.091
Process Quality 2.4	1.103	1.506	0.112	0.011	0.100	1.057	1.536	0.107	0.010	0.074
Process Quality 3.1	1.396	1.367	0.149	0.021	0.109	1.001	1.402	0.107	0.010	0.075
Process Quality 3.2	0.834	1.446	0.090	0.007	0.095	1.503	1.462	0.161	0.021	0.086
Process Quality 3.3	-0.519	1.612	-0.054	0.002	0.091	-0.156	1.645	-0.016	0.000	0.065
Process Quality 4	1.406	1.347	0.153	0.022	0.110	0.931	1.383	0.101	0.009	0.074
Bloc 3										
Structural variables X Quality 1.1				0.063	0.063				0.065	0.190
Structural variables X Quality 1.2				0.093	0.211				0.082	0.168
Structural variables X Quality 2.1				0.018	0.185				0.065	0.191
Structural variables X Quality 2.2				0.010	0.261				0.040	0.241
Structural variables X Quality 2.3				0.101	0.192				0.117	0.208
Structural variables X Quality 2.4				0.053	0.153				0.032	0.106
Structural variables X Quality 3.1				0.091	0.200				0.085	0.160
Structural variables X Quality 3.2				0.151	0.246				0.130	0.216
Structural variables X Quality 3.3				0.189^{t}	0.280^{t}				0.132	0.196
Structural variables X Quality 4				0.028	0.139				0.100	0.174

Note: ^{t} p-value > adjusted p-value with Bonferronni correction, ** p-value < adjusted p-value with Bonferronni correction

Discussion – mediation or moderation

- Direct effect of quality of observation practices.

- ≠ support to the mediation model.

- Moderating effect of quantity and type of childcare on children's EB and IB.

- ≠ moderating effects of structural quality.
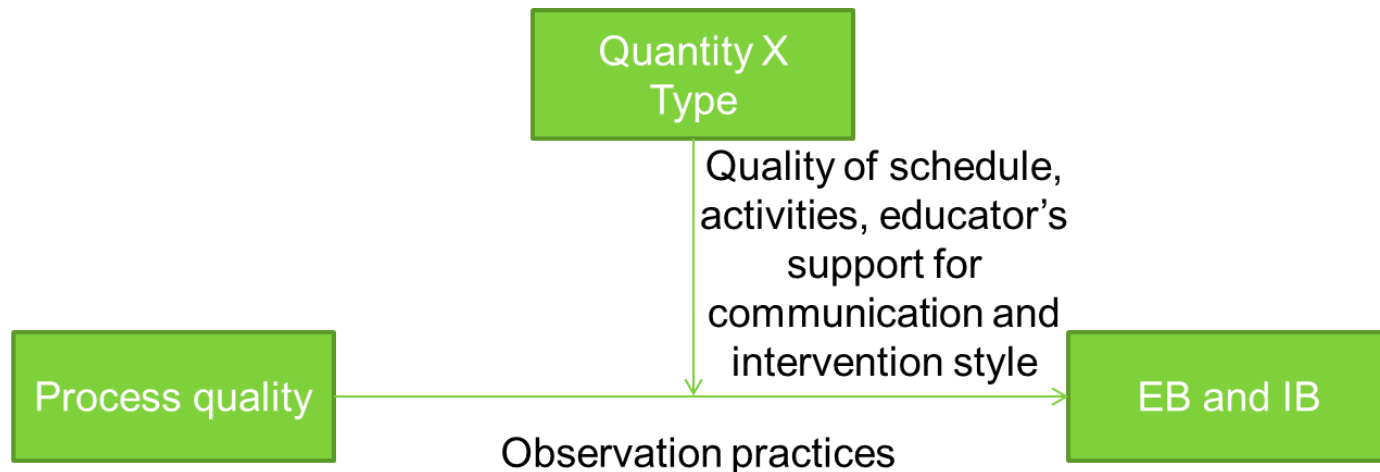
Discussion – Quantity X type

- Subscales of process quality related more strongly to EB and IB depending on the amount of time spent in center or home.

+ 45h/week in a center	↗ quality educator's intervention style and her support for communication = ↘ EB	Need for flexibility?
-35 h/week in a home	↗ quality schedule, activities and educator's support for communication = ↘ EB ↗ quality schedule = ↘ IB	Need for structure?
More time in center or less time in home	More able to adopt high-quality practices when children already exhibited less EB & IB at 24 months-old ➔ Those might still exhibit less EB & IB at 36 months-old.	Stability?

- Importance of other dimensions of educators' practices to help reduce behavioral difficulties in a given setting.

Conclusion

Limitations

- Children in the sample
- Quantitative nature of the research

Conclusion

- Propositions formulated from an ecological perspective;
  - Examining the interactive influence of quantity, type and quality;
  - Considering process quality as a multidimensional construct;
  - Using process quality measurement scale that is coherent with a given educational program.

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