

Poverty, Child Health, and Cognitive Development at Age 6: Some Results from the Québec Longitudinal Study of Child Development (QLSCD-Canada)

Introduction

Background

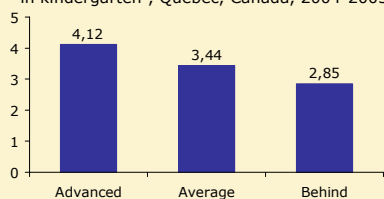
Receptive language in preschoolers, often used as an indicator of cognitive skills, is recognized as being a good predictor of school performance. Although it is generally admitted that children from low-income families are more likely to have some delay with this language skill, there are still some controversy on the real impact of poverty and the actual processes involved. Among other things, the role of health conditions in early childhood has not been thoroughly examined. In fact, poor health conditions could constitute a determinant factor which modulates the relationship between poverty dynamics and cognitive development.

Study objective

To analyse the effects of poverty dynamics, health and family living conditions during preschool years on the receptive language skills of children at the time they enter school, as measured by the Peabody Picture Vocabulary Test (PPVT-R).

Why should we care about language skills?

Average school performance in grade one as related to the level of vocabulary acquisition in kindergarten¹, Québec, Canada, 2004-2005



Increased vulnerability is already present in infancy . . .

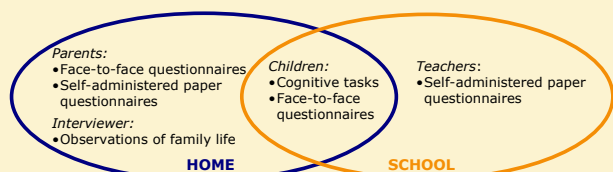
- Among kindergarten children with delayed receptive language skills, 35% had not yet pronounced the name of a familiar object at 1½ years old (vs 22% for average-performing children, and 10% for children considered more advanced).
- From 17 months old and on, children with delayed receptive language skills showed more symptoms of internalized problems and to a lesser degree, symptoms of physical aggressiveness according to their mothers.

Source: QLSCD

Data source

The present work was accomplished using data from the QLSCD (1998-2010) which is conducted by the "Institut de la statistique du Québec". This longitudinal study was first initiated to get a better understanding of early childhood pathways which lead to success or failure in school. The target population includes all children (singleton births only, except very premature infants) born to mothers residing in Québec, Canada, in 1997-1998.

QLSCD Data Collections (regular annual rounds) – From age 5 months to kindergarten



Method

Participants

A representative sample of 1,077 children born in Québec and aged 6 years, who had taken the PPVT, in French or in English, when they were attending kindergarten (2004). Exclusion criteria were as follow: children with special exemption or not attending school; children with major developmental problems (e.g., autism); children who did not take the PPVT in the same language as the one they were the most exposed to in childhood.

Measures and procedures

Dependent variable. Receptive language skills.

Receptive language skills were measured using the Peabody Picture Vocabulary Test – Revised (PPVT-R) (Dunn and Dunn, 1981).

We have defined children with "delayed receptive language skills" as the one who rank in the lowest quintile according to their raw PPVT score.

Independent variable. Low-income (poverty) dynamics

In the absence of an official measure of poverty, we used Statistics Canada's before-tax low-income cut-offs as poverty thresholds.

Four groups were identified to evaluate the impact of the duration and timing of poverty:

- None:** no low-income episode before kindergarten
- Recent:** only one or two recent episodes of low-income (at age 5 or 6)
- Early:** at least one low-income episode before age 4
- Chronic:** below the low-income threshold from birth to age 6

Risk and protective factors

Sociodemographic characteristics	<ul style="list-style-type: none"> Educational level of mother (at 6 years) Age of the mother when the child was born Birth rank of the child Family type at birth Parents' separation
Prenatal and postnatal health habits	<ul style="list-style-type: none"> Tobacco use during pregnancy Duration of breast-feeding
Child health conditions	<ul style="list-style-type: none"> Birth weight Yearly General health status as perceived by mother Presence of chronic health problem (at 1½ years) Hospitalization (at 5 months) Ear infection(s) (at 1½ years)
Stimulation activities	<ul style="list-style-type: none"> Frequency of being read to by a parent (at 1½ years) Childcare attendance beginning at 1½ years
Parenting practices	<ul style="list-style-type: none"> Family functioning (at 5 months and 1½ years) Overprotectiveness by mother (at 5 months) Mother's verbal and emotional skills (HOME) (at 2½ years)
Social environment	<ul style="list-style-type: none"> Social support (at 2½ years) Social cohesion of neighbourhood according to mother (at 6 years) Material deprivation of the neighbourhood (at 6 years)

Data analysis

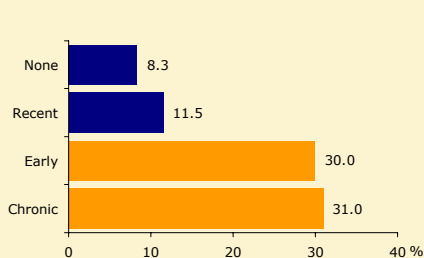
Chi-square tests and logistic regression:

- The variables shown in bold were entered in the regression models based on their association with both dynamic of poverty and delayed language skills.
- Data have been weighted to allow generalization to the target population.
- All estimates and their accuracy were produced by taking into account the complex survey sample design using the SUDAAN software.

Results: The impact of the duration and timing of poverty

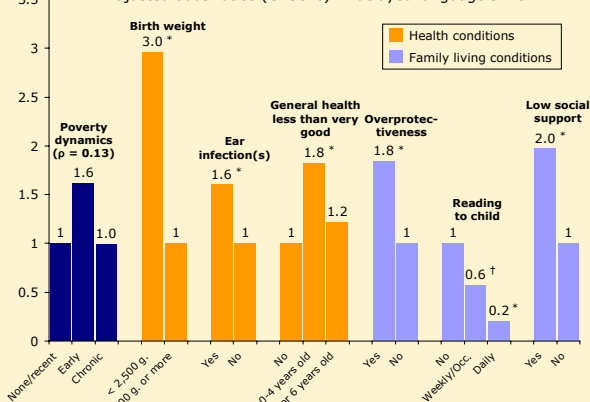
Delayed language skills are associated to early poverty, chronic or not

Proportion of children showing delayed in vocabulary acquisition at the end of kindergarten¹, by poverty dynamics



The non-significant impact of early poverty on delayed language skills in a model including health and family living conditions

Adjusted odds ratios (CI 95%)¹ – delayed language skills



1. Adjusted for sex, age, exposure to another language, and mother's educational level.

* $p < 0.05$; † $p < 0.10$ relative to the reference category, the value for which is set at 1.

Summary of findings

Results indicate that delayed language skills of children living in poverty are largely due to their poorer health and the family living conditions in which they were raised. According to QLSCD data, the impact of chronic insufficient income disappears when the educational level of mothers is put in the model.

After testing for interactions between different variables included in the final regression model and the poverty dynamics variable, results show that being a boy is associated with a delay in language skills only in poorer settings. Also, learning more than one language seems to be associated with lower language skills performance, in French or in English, only for children who have lived in poverty before age 4.

Research and policy implications

To optimize the development of language in infancy, results show the importance of pursuing early intervention programs. Special attention should be put on health and family living conditions of the child.

Given the predictive nature of school preparation for academic achievement and later social adjustment, it appears essential to pursue research and analysis in order to better identify protective factors among high-risk children.