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Children's Health Prior to School Entry and Reading Skills in the First Year of Primary School: Identifying Protective Factors

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ABSTRACT

Background

Reading skills at school entry are one of the main determinants of future academic performance.¹ Therefore, less than optimal health during the first years of life can affect the capacity for learning,² which in turn can have an impact on health and social adjustment throughout life. The main goal of this analysis was to examine the impact of young children's health trajectories on their reading skills in the first year of primary school (Grade 1), as assessed by their teachers.

Methods

The analysis was based on data collected annually during the first eight years of the *Québec Longitudinal Study of Child Development* (QLSCD 1998-2010). The target population included all children (singleton births, excluding premature) born to mothers in 1997-1998 residing in Québec, Canada. A regression analysis was conducted to examine the impact of health trajectories from birth to school entry on reading skills in Grade 1. Interactions were tested to ascertain to what degree stimulation activities in the pre-school period such as family reading habits, the mother's verbal and emotional skills, and daycare attendance can contribute to reducing inequalities in reading skills between children with less than optimal health and their peers.

Findings

The results revealed that less than optimal health, particularly in early childhood, was associated with lower reading skills in the first year of primary school. Therefore, certain health problems in young children may affect their capacity to learn well before formal education in reading has begun at school. However, the significant association with health trajectories decreased when the mother's educational level entered into the model, the latter being revealed as one of the variables with the strongest association with children's reading performance. All things being equal, higher verbal and emotional skills in the mother as assessed by the interviewer when the children were very young seemed to be a protective factor in children who were more vulnerable in terms of their health status.

Research and policy implications:

Given the importance of reading skills for success in school and future social adjustment, it will be important to conduct further analyses in order to gain a better understanding of protective factors in children at higher risk because of health problems or the low educational level of the parents. Activities designed to improve parenting skills and/or stimulate interest in reading may contribute to fostering learning skills in reading in the first year of primary school in the most vulnerable populations.

Keywords: child, health, reading skills, school achievement, QLSCD.

¹ DUNCAN, G. J., C. J. DOWSETT, A. CLAESSENS, K. MAGNUSON, A. HUSTON, P. KLEBANOV, L. PAGANI, L. FEINSTEIN, M. ENGEL, J. BROOKS-GUNN, H.R. SEXTON, K. DUCKWORTH, & C. JAPEL (2007). "School readiness and later achievement," *Developmental Psychology*, vol. 43, no. 6, p. 1426-1446.

² DESROSIERS H., and A. DUCHARME (2008). *Poverty, Child Health, and Cognitive Development at Age 6: Some results from the Québec Longitudinal Study of Child Development (QLSCD, Canada)*, poster presented at the 20th Biennial ISSBD Meeting, Wurzburg (Germany), July 15, 2009.

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happy
educated
active
healthy



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INTRODUCTION

Reading skills constitute one of the main determinants of academic achievement.¹ Though it is generally recognized that disadvantaged children manifest lower performance in reading, less is known about the role health plays in learning and to what degree various stimulation activities can contribute to fostering school readiness among children whose health renders them more vulnerable.²

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OBJECTIVE

Examine the influence of health status in early childhood on reading skills among children in the first year of primary school, and verify whether certain stimulation activities in the preschool period can contribute to reducing inequalities in reading skills related to health trajectories.

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DATA SOURCE

The analysis was based on data from the *Québec Longitudinal Study of Child Development* (QLSCD 1998-2010). The children were followed annually from the age of 5 months to 8 years, and since then are being followed biannually up to the age of 12. Data used in this analysis were collected from the Person Most Knowledgeable about the child (PMK) (in most cases the mother), as well as the interviewer, and the teacher.

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METHODS

Participants

A representative sample of 1,276 children born in Québec, who were approximately 7 years of age in 2005 (mean age = 7 years and 2 months). Excluded were the following: children who were not in Grade 1 due to a special dispensation or any other reason, children presenting with a chronic developmental condition such as autism, children whose teacher was not teaching them reading.

Dependent variable

Performance level in reading in Grade 1, as assessed by the teacher. The original variable was divided into two categories – Average or Above Average (77%), and Below Average (23%). Performance level in reading as judged by the teacher was strongly associated with the results obtained from administering a reading test (K-ABC) as well as overall academic achievement.

Independent variable. Health Trajectories of the Child (based on the mother's assessment every year). Perceived health is considered a good indicator of a child's overall health.³ Three groups were identified:

Risk or Protective Factors

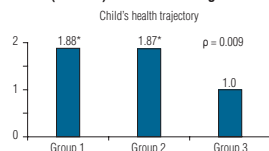
Low birth weight
Sociodemographic Characteristics: child's age, sex, exposure to a language other than that of instruction at school, low income episodes since birth, current educational level of the mother.
Stimulation Activities: contact with books (at 1½ yrs), adult in the household reads aloud to the child (at 1½ yrs), browses through books him/herself (at 2½ yrs), attended daycare (from the age of 1½ yrs to school entry), used a computer (at 4 yrs of age).
Parenting Practices: maternal overprotectiveness (5 months), mother's verbal and emotional skills as assessed by the interviewer (HOME) (at 2½ yrs).
Social Environment: social support (at 2½ yrs), social deprivation scale of the neighbourhood (at 7 yrs).

Data analysis.

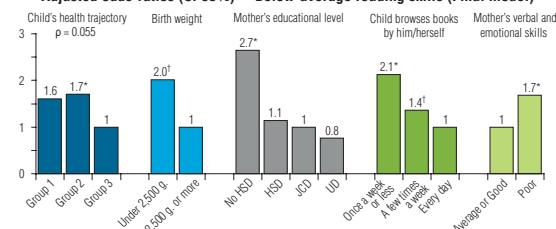
Chi-square tests and logistic regression.
✓ All the variables associated with reading performance at the threshold of 0.10 in bivariate analyses were entered into the regression.
✓ SUDAAN software was used to produce weighted estimates and to address the complex sample design of the survey.

Figure 1
IMPACT OF CHILDREN'S HEALTH TRAJECTORIES ON THEIR READING PERFORMANCE IN THE FIRST YEAR OF PRIMARY SCHOOL, QLSCD, QUÉBEC, CANADA, 1998-2005

Adjusted odds-ratios (CI 95%)^a – Below-average reading skills (Step 1)



Adjusted odds-ratios (CI 95%)^a – Below-average reading skills (Final model)



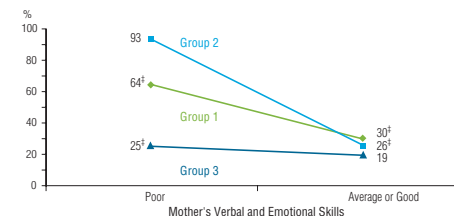
a. Adjusted for sex, age, and exposure to another language.
* $p < 0.05$; † $p < 0.10$ relative to the reference category, the value of which is set at 1.
HSD: High School Diploma; JCD: Junior College Diploma; UD: University Degree.

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SUMMARY OF FINDINGS

- Health trajectories were associated with children's reading performance in the first year of primary school (Grade 1), even taking into account other characteristics such as age, sex and exposure to a language other than that of instruction in school (Step 1, see Figure 1). Children presenting with less than optimal health during the pre-school years were most likely to manifest below-average reading performance in Grade 1, even if their current health status was very good or excellent. The impact of health on reading performance was however considerably weaker when the mother's educational level was entered into the model (Final model, see Figure 1) because of the strong association between these characteristics.
- Among the variables assessing family reading habits, the child's interest in reading was the one most strongly associated with reading performance at the age of 7 years.
- Tests on the interaction between health trajectories and stimulation activities showed that higher verbal and emotional skills in the mother constituted a protective factor for children whose health was less than optimal (Group 1 and Group 2, see Figure 2). This result holds even when all the other characteristics were taken into account (data not shown).

Figure 2
PROPORTION OF CHILDREN WITH BELOW-AVERAGE READING ABILITY BY HEALTH TRAJECTORY AND MOTHER'S VERBAL AND EMOTIONAL SKILLS, QLSCD, QUÉBEC, CANADA, 1998-2005



† Coefficient of variation between 15% and 25%; interpret with caution.

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RESEARCH AND POLICY IMPLICATIONS

Given the importance of reading skills for success in school and future social adjustment, it will be important to conduct further analyses in order to gain a better understanding of protective factors in children at higher risk because of health problems or the low educational level of their parents. Activities designed to improve parenting skills and/or stimulate interest in reading may contribute to fostering learning skills in reading in the first year of primary school in the most vulnerable populations.

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