Mothers' Evaluation of Their Toddlers' Hyperactivity and Inattention Symptoms: A Tool for Prevention?

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Society for Research in Child Development, Montréal, Québec, March 31 – April 2, 2011

INTRODUCTION

Attention deficit disorder with or without hyperactivity (ADD or ADHD) is of great concern to the Québec government. It is devoting funds in a number of ministries to conduct better interventions and provide more information to stakeholders and practitioners, particularly in the education system. ADD or ADHD is a neurological phenomenon usually characterized by lack of attention, concentration problems, and sometimes hyperactivity or impulsivity. It can lead to problems in school^{1,2} and low self-esteem which, in certain cases, will persist into adulthood. Although ADD or ADHD is often diagnosed around the age of 7 years, it seems that in some children it is possible to observe its manifestations at a very young age, namely in the pre-school years.³

GOALS

- Document hyperactivity and inattention (HI) symptoms trajectories in children between 3½ and 8 years of age, as reported by their mothers.
- Analyze associations between these trajectories and:
- 1) Assessments provided by the children's teacher (HI symptoms and academic achievement)
- (2) Diagnosis of ADD or ADHD.

DATA SOURCE

Québec Longitudinal Study of Child Development (QLSCD 1998-2010) conducted on an initial sample of about 2,000 children born in Québec in 1997-1998. The children have been followed annually from the age of 5 months. Data analyzed here include those on the children from when they were 3½ to 8 years of age. The data were collected from the person most knowledgeable of the child, generally the mother, and the child's main teacher.

METHODOLOGY

A representative sample of 1,397 children born in Québec approximately 8 years of age in 2006.*

Measures

Hyperactivity and inattention symptoms reported by the mother From 2001 to 2004, and in 2006, the person most knowledgeable of the child, generally the mother, was asked how often (never, sometimes or often) during the past 12 months the child:

- () Could not sit still, was restless or hyperactive
- 2) Couldn't stop fidgeting
- 3) Was impulsive, acted without thinking
- 4) Had difficulty waiting for his/her turn in games Couldn't settle down to do anything for more than a few moments
- Was unable to concentrate, could not pay attention for long
- 7) Was easily distracted, had trouble sticking to any activity
- Was inattentive
- Was unable to wait when someone promised him/her something.**

A scale of 0 to 10 was constructed based on the responses to these items.

Hyperactivity and inattention symptoms reported by the teacher

The items were the same as the nine ones assessed by the mother. A scale from 0 to 10 was constructed based on the teacher's responses to them.

Academic achievement

The teacher was asked to rate the child's academic achievement in school in terms of reading, writing and mathematics. Response choices were the following:

- (1) Near the top of the class
- (2) Above the middle of the class, but not at the top
- (3) In the middle of the class
- (4) Below the middle of the class, but above the bottom
- (5) Near the bottom of the class.

A scale from 0 to 12 was constructed based on the teacher's responses.

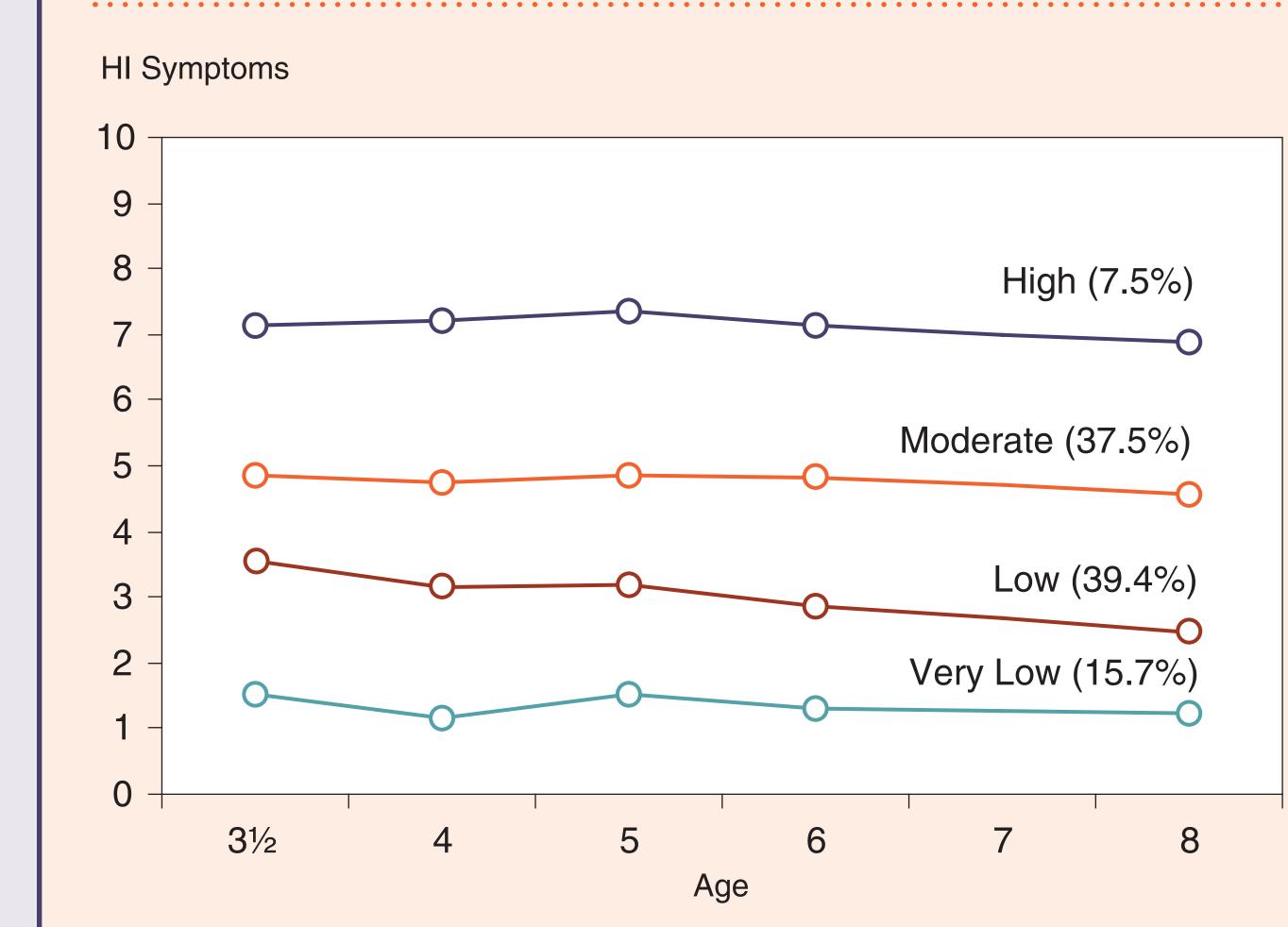
Diagnosis of ADD or ADHD

From the age of 5 years, the parents have been asked if their child had ever been diagnosed by a health professional as having attention deficit with or without hyperactivity.

Group-based modeling,⁴ statistical tests of proportion differences, and ANOVA.

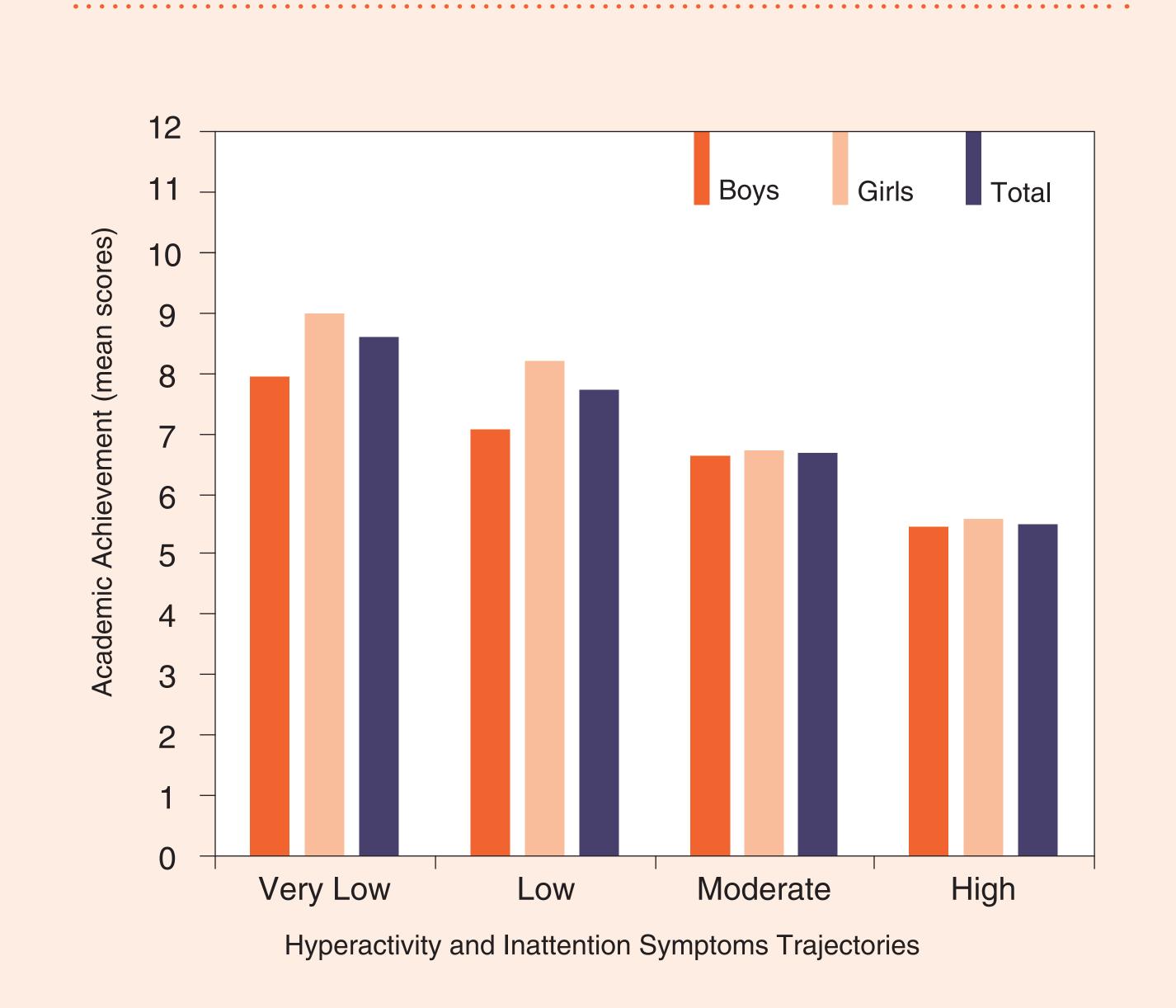
- Data were weighted so that the results could be generalized to the target population of the QLSCD.
- To conduct statistical tests, an imputation procedure was used to enter in the models the probability of belonging to an estimated trajectory and the incertitude associate with it.
- The complex sample design of the survey was taken into account in the statistical tests.
- Excluded are children who arrived in Québec after their birth, namely approximately 9% of children 8 years of age in 2006.
- This item was not asked in the first two rounds analyzed here.

HYPERACTIVITY AND INATTENTION (HI) SYMPTOMS TRAJECTORIES¹ IN CHILDREN FROM 3½ TO 8 YEARS OF AGE, QUÉBEC, 2001-2004 AND 2006



- Note: There are no data for children 7 years of age but an adjustment was made to correct
- . The estimated proportion of children associated with a trajectory is based on a probabilistic method and represents the approximate proportion following the same developmental
- → 8% of children were likely to present a High score on the hyperactivity and inattention symptoms scale from 3½ to 8 years of age. This was more often the case for boys than for girls (10% vs. 5%; data not shown).
- Irrespective of the children's assigned group, the trajectories remained rather stable over time.

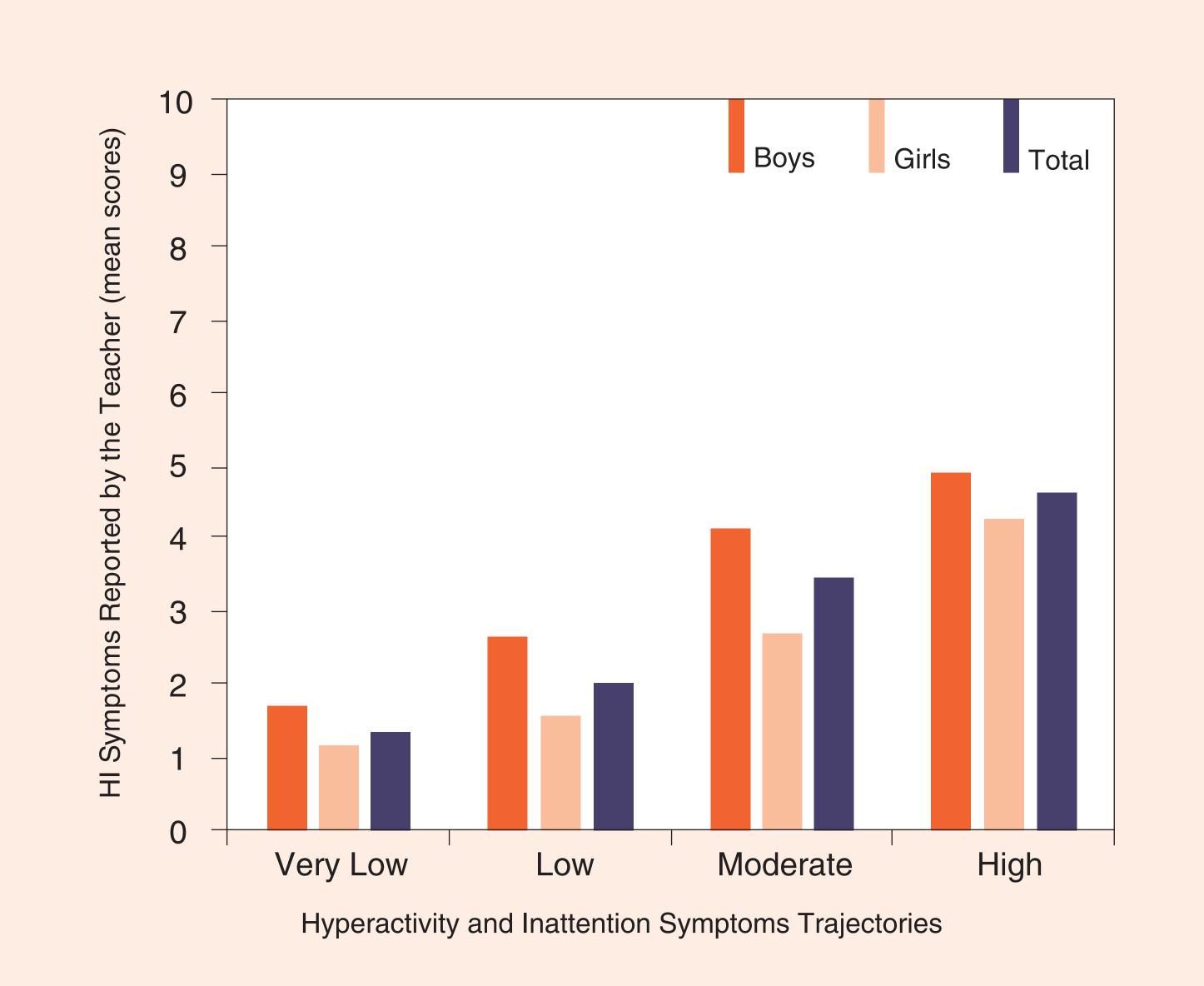
ACADEMIC ACHIEVEMENT IN GRADE 2 BY HI SYMPTOMS **TRAJECTORIES AND SEX, QUÉBEC, 2006**



- Children in the High trajectory group of HI symptoms presented lower academic achievement than the ones in other trajectory groups. The results have the form of a gradient.
- Except for the Low HI trajectory wherein girls presented better academic achievement than boys, in general academic achievement showed no significant differences by sex whatever the trajectory.

TEACHERS' RATING OF HYPERACTIVITY AND INATTENTION SYMPTOMS IN GRADE 2 CHILDREN BY HI SYMPTOMS TRAJECTORIES AND SEX, QUÉBEC, 2006

RESULTS



- The assessment of hyperactivity and inattention symptoms provided by the teachers in Grade 2 corroborated that of the mothers. Indeed, the results take the form of a gradient.
- As reported by their teachers, boys in the Very Low, Low and Moderate trajectories had a higher score in hyperactivity and inattention symptoms than girls, while those in the High trajectory had a score similar to that of the girls.

CHILDREN HAVING BEEN DIAGNOSED WITH ATTENTION DEFICIT WITH OR WITHOUT HYPERACTIVITY, BY HI SYMPTOMS TRAJECTORIES, QUÉBEC, 2001 TO 2004 AND 2006

Hyperactivity and inattention symptoms trajectories	Distribution of children diagnosed	% Having been diagnosed with ADD or ADHD in each trajectory
High (n=94)	36.0%*	35.2%*
Moderate (n=512)	51.0%	9.5%*
Low (n=525)	11.4%**	2.1%**

Very low (n=211)

- * Coefficient of variation between 15% and 25%; interpret with caution.
- ** Coefficient of variation higher than 25%; imprecise estimate provided for information
- According to QLSCD data, approximately 7% of 8-year-old children had already been diagnosed with ADHD (data not shown).
- Although a large majority of diagnosed children were in the High (36%) and Moderate (51%) trajectories, only around a third (35%) of children in the High trajectory had received such a diagnosis compared to about 10% of those in the Moderate and a negligible proportion in the other

SUMMARY OF FINDINGS

Children with high scores on a hyperactivity and inattention symptoms scale (8%) have lower academic achievement, irrespective of their sex or of having been diagnosed or not with ADD or ADHD. These findings match those of other longitudinal analyses, which show that a higher level of cognitive self-regulation at school entry is associated with higher academic achievement in elementary school (Duncan et al., 2007), even while controlling for other factors.

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RESEARCH AND POLICY IMPLICATIONS

Mothers are in a privileged position for early detection of hyperactivity and inattention symptoms in their children. The data reveal that their continuous assessment of these symptoms, beginning well before the child enters school, corroborates that of the child's teacher in Grade 2 of elementary school. Prevention programs and activities should therefore target children at an early age. Our findings, however, should be validated in future studies, so that mothers' assessments serve as a public health tool to identify those children who could benefit from early intervention.





QLSCD Web Site: www.iamillbe.stat.gouv.qc.ca