



Positive Teacher-Student Relationships: Associations with Child Characteristics and Academic Achievement in Elementary School

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QLSCD 1998-2010 in brief

This fascicle is based on data from the *Québec Longitudinal Study of Child Development* (QLSCD 1998-2010) which is being conducted by the Institut de la statistique du Québec (Québec Institute of Statistics) in collaboration with various partners (listed on the back cover). The goal of this study is to gain a better understanding of the trajectories which, during early childhood, lead to children's success or failure in the education system.

The target population of the QLSCD comprises children (singleton births) born to mothers residing in Québec in 1997-1998, with the exception of those whose mother, at the time of the child's birth, was living in certain administrative regions of the province (Nord-du-Québec, Terres-Cries-dela-Baies-James and Nunavik) or on Indian reserves. Certain children were also excluded because of constraints related to the sample frame or major health problems. The initial sample eligible for longitudinal monitoring comprised 2,120 children. The children were monitored annually from about 5 months to 8 years of age, and then biannually up to the age of 12, when they finished elementary school. A round of data collection was conducted in 2011, when most of the children were in their first year of high school (Secondary 1).

The QLSCD employs a variety of data collection instruments to gather data on the child, the person most knowledgeable of the child (PMK), her or his spouse/partner (if applicable), and the biological parent(s) not residing in the household (if applicable). During each data collection round, the child is asked to participate in a variety of activities designed to assess development. As of the 2004 round, the child's teacher is also being asked to respond to a questionnaire covering various aspects of the child's development and adjustment to school.

Further information on the methodology of the survey and the sources of data can be accessed on the website of the QLSCD (also known as "I Am, I'll Be"), at www.iamillbe.stat.gouv.qc.ca.



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For the majority of Québec children, kindergarten entry is the first experience of formal education. Indeed, nearly all children attend public or private school from the age of five years on, even though it is not compulsory (Institut de la statistique du Québec [ISQ], 2010; Ministère de l'Éducation, du Loisir et du Sport [MELS], 2010). This transition from home or child care to school results in significant changes in their ecological system (Bronfenbrenner, 1979). Children find themselves in a developmental context that differs from the one they had known until that time, and they often experience new relationships with their peers in addition to establishing a relationship with their teacher.

At the beginning of elementary school, children spend approximately 6 hours a day in class, 10 months a year. We can therefore expect that the relationship they have with their teacher greatly contributes to their social and academic adjustment (Greenberg, Speltz and Deklyn, 1993; Pianta, 1999; Pianta and Stuhlman, 2004). Indeed, diverse studies suggest that teachers can have a positive or negative impact on the capacity of a child to be successful in school. Students who have a positive relationship with their teacher obtain higher marks and manifest greater motivation and participation in class (Hamre and Pianta, 2005). Moreover, such children possess a higher level of social skills and present appropriate behaviours in class (Hughes and Kwok, 2006; Pianta et al., 2002). Studies also reveal that these relationships are likely to influence behaviour and affective adaptation as well as their motivation to invest in their academic learning

I. The authors are listed in alphabetical order.

(Connell and Wellborn, 1991; Pianta, 1999; Sameroff et al., 1998; Yates, Egeland and Sroufe, 2003). A warm and open relationship between a teacher and a student fosters social, emotional and academic functioning in a child, whereas a high level of conflict and discord between a teacher and a student may adversely affect child development (Baker, 2006; Fortin et al., 2004; Hamre and Pianta, 2001; Ladd and Burgess, 2001; Pianta, Steinberg and Rollins, 1995; Pianta and Stuhlman, 2004; Venet, Schmidt and Paradis, 2008; Venet et al., 2009). A positive teacher-student relationship in the first few years of elementary school is associated with many indicators of later success in school, not only academically (Hamre and Pianta, 2001; Pianta and Stuhlman, 2004), but also in terms of social and emotional functioning (Decker, Dona and Christenson, 2007).

Robert Pianta has conducted considerable research on various aspects of teacher-student relationships and their effects on child development. He developed a typology based on three dimensions – closeness, conflict and dependency (Pianta, 1994; Pianta, Steinberg and Rollins, 1995). This fascicle specifically covers certain aspects of the dimension of closeness, also referred to as a positive relationship. “Closeness” comprises a close relationship, positive and supportive, with the teacher. A strong and personal relationship with the teacher, marked by frequent and supportive communication rather than criticism, results in a child developing a relationship of trust, manifesting more engagement, presenting positive behaviours in class, and consequently higher academic achievement (Cornelius-White, 2007; Rimm-Kaufman, 2011).

It should be emphasized that the quality of the teacher-student relationship is not only a function of the teacher’s relational skills but also the result of an interactive process between them and student characteristics (Sameroff, 2010). Indeed, research has demonstrated that certain characteristics of children have a positive influence on the quality of the teacher-student relationship, while others have a negative influence. For example, good social and scholastic skills among children are associated with quality teacher-student relationships in the first few years of elementary school (Maldonado-Carreño, 2005). In contrast, a child’s externalized behavioural problems are associated with a less positive teacher-student relationship (Baker, 2006; Maldonado-Carreño, 2005).

Other characteristics of children (e.g. sex) and the family (e.g. socioeconomic status) have also been shown to be associated with the quality of the teacher-student relationship. Studies have shown that teachers have less positive relationships with boys and children from disadvantaged families (Baker, 2006; Birch and Ladd, 1997; Hamre and Pianta, 2001; Ladd, Birch and Buhs, 1999).

Based on data from the Québec Longitudinal Study of Child Development (see box entitled “QLSCD 1998-2010 in brief”), the aim of this fascicle is to document the positive dimension of teacher-student relationships in kindergarten and Grade 1, Grade 2, and Grade 4 of elementary school.² We also explore associations between a positive teacher-student relationship and certain child characteristics. Finally, we examine the unique contribution of a positive teacher-student relationship to academic performance and the results of tests assessing children’s receptive vocabulary and arithmetic skills in Grade 4.

Methods

This fascicle covers QLSCD data collected during the 2004, 2005, 2006 and 2008 rounds when the children were approximately 6, 7, 8 and 10 years of age.³ The majority of them were in kindergarten, Grade 1, Grade 2 and Grade 4 respectively.⁴ The QLSCD is a longitudinal survey conducted on a cohort of children born in Québec at the end of the 1990s. Therefore, excluded from the target population are children who moved to Québec after their birth, comprising between 7% and 10% of Québec children who were part of the same age cohort as the initial sample.⁵ It should also be noted that the vast majority of children had women teachers rather than men. This was the case for 97% of the children when they were in kindergarten, 96% when they were in Grades 1 and 2, and 90% when they were in Grade 4.

Assessing aspects of a positive teacher-student relationship in the QLSCD

At each round of data collection, teachers of the QLSCD children were asked to respond to a series of questions measuring certain aspects of a positive teacher-student relationship. From the age of 7 years onward (Grade 1 in elementary school), the children were also asked questions which would be indicators of positive aspects of their relationship with their teacher. All questionnaires were filled out near the end of the school year. However, in this fascicle only items used in all the survey rounds were retained for analysis (see Box 1).

It is important to emphasize that the QLSCD is the first large-scale Québec survey to assess the teacher-student relationship from both the teachers’ and the children’s points of view. Analyses of the data revealed that though there were associations between the teachers’ and children’s responses, the correlations ranged from weak to moderate, thereby indicating the importance of analyzing both the teachers’ and the children’s perceptions (data not shown).

Characteristics of the children and their families

Characteristics in the analyses of children or their families when the former were 7, 8 and 10 years of age were the following: child’s sex, household income reported by a parent (above or below the low-income cutoff⁶), and externalizing and internalizing behaviours reported by the teacher. Externalizing behaviours analyzed were hyperactivity, inattention, physical aggression and opposition. Internalizing behaviours analyzed were anxiety and emotional problems. In addition to scales of these behaviours, two composite scales were constructed for the sets of externalizing and internalizing behaviours. The method chosen was to compare the children presenting the most teacher-reported behavioural problems with the other children. More specifically, according to the distribution of the data, children in the most problematic decile or quintile of the scales⁷ were compared with the remaining children. All variables related to the child and family were measured in the same rounds as the teacher-student relationship (see Appendix A for a detailed description of these variables).

Box 1

Teachers' assessment of positive aspects of their relationships with the children

Positive teacher-student relationships were assessed using a number of items in the *Self-Administered Questionnaire for the Teacher* (SAQT). These items formed a reduced version of the *Student-Teacher Relationship Scale* (STRS; Pianta, 1992). In the 2004 round, when the children were a median 6 years of age (near end of kindergarten), the teacher was asked 7 questions to assess positive aspects of her⁸ relationship with the survey child in her class. Only 4 of these questions were asked in the subsequent rounds, when the children were 7, 8 and 10 years of age (2005, 2006 and 2008 respectively) and kept in the analyses. The teacher was asked to respond to the following items: "1) I share a close and warm relationship with this child; 2) This child spontaneously shares information about him/herself; 3) It is easy to be in tune with what this child is feeling; 4) My interactions with this child make me feel effective and confident." The response choices were: "1) Definitely does not apply; 2) Not really; 3) Neutral, not sure; 4) Applies somewhat; 5) Definitely applies." Because of small numbers, the first three response choices had to be grouped together in the analyses, and therefore are referred to as "Does not apply/ Neutral, not sure."

Children's assessment of positive aspects of their relationship with their teacher

From the age of about 7 years onwards (2005 round, Grade 1), the children were asked about positive aspects of their relationship with their teacher in a number of items in the *Paper Questionnaire Administered to the Child* (PQAC). The questions were developed for the QLSCD to measure the children's perception of the quality of their relationship with their teacher. They were based on two dimensions defined by Pianta (1992), a close and warm relationship, and a conflictual relationship. The items were worded to be understood by the children. Four of these items tested for positive aspects of the relationship, and comprised the following: "1) You feel at ease to ask your teacher questions when there is something you don't understand; 2) Your teacher congratulates you when you do well in something; 3) You like your teacher; 4) You can talk to your teacher, he/she listens and answers nicely." The response choices were: "1) Never or not true; 2) Sometimes or somewhat true; 3) Often or very true." Because of small numbers, the first two response choices had to be grouped together in the analyses.

Although the child's behaviours were also assessed by the parent in a number of QLSCD rounds, only the teacher's assessment was available for 2005 when the children were 7 years of age. However, the teacher was a good source of information since her evaluation of the child's behaviour and performance was based on her experience of many children in many classes. Moreover, the teacher's evaluation of the child's behaviours was based on what she had observed in many situations and contexts over a six-month period. Indeed, research indicates that teachers' assessments provide an accurate and valid means of measuring and capturing children's externalizing and internalizing behaviours (Duncan et al., 2007). More precisely, previous research based on QLSCD data has revealed that with regards to hyperactivity or inattention, teachers' assessments of the children when they were in Grade 2 matched those of the mothers (Cardin et al., 2011).

Academic achievement was measured in three ways. The first was overall performance of the child as reported by the teachers in Grade 1, Grade 2 and Grade 4. The teachers' response choices were: "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." Academic achievement was also measured in certain QLSCD rounds using two tests – the Peabody Picture Vocabulary Test and an abridged version of the CAT/2 arithmetic test. For the purposes of this fascicle, results were analyzed for when the children were 10 years of age (see Appendix A for a detailed description of these variables).

Analysis strategies

In this fascicle, items on the positive teacher-student relationship are addressed separately rather than in the form of scales for two reasons. First, analysis by item seemed appropriate in order to be able to document certain components of a positive teacher-student relationship and child characteristics associated with these, which will be of particular interest to stakeholders and professionals in education. Secondly, it was not possible to construct scales with an acceptable level of internal consistency based on responses of the children in the first few years of elementary school.⁹ In other words, items examining the children's points of view did not seem to be measuring the same underlying concept so they were addressed separately.

Changes in the teacher-student relationship and associated characteristics

To examine changes in the teacher-student relationship in elementary school, teachers' and children's responses in each round were analyzed first. Then bivariate analyses were conducted to see to what degree assessments of a positive relationship were associated with child or family characteristics when the children were 7, 8 and 10 years of age. As previously mentioned, child characteristics taken into account in the analysis were sex, externalized behaviours and internalized behaviours, and the family characteristic was household income.

Multiple logistic regressions were then conducted to discover the variables with the strongest associations with each of the items when the children were a median age of 10 years (generally near the end of Grade 4). At this age, more variations were observed in the children's assessments compared to the early years of elementary school (see further below).

In addition, given the education sector's interest in the issue, the assessment of the teacher-student relationship in Grade 4 is presented by sex of the teacher.

Positive teacher-student relationship and academic achievement in elementary school

To examine possible associations among responses to various items on a positive teacher-student relationship and academic achievement, bivariate analyses were conducted for each age under study. Then multiple logistic regressions were conducted to determine the contribution of a positive teacher-student relationship to academic achievement, as measured by teacher-assessed overall academic performance and the results of an arithmetic test and a vocabulary test conducted at the age of 10 years, after characteristics of the child and family were entered into the model. Separate models were generated for the teachers' assessment and the children's assessment of the relationship.

Of note is that the *Self-Administered Questionnaire for the Teacher* (SAQT) had a lower response rate than other questionnaires used in the QLSCD. Using this instrument in combination with other questionnaires or tests contributed to a lower net number of respondents. With regards to the sample, it varied between 948 and 1,526 children depending on the analysis conducted. However, the data presented here were weighted and therefore adjusted so that the results could be generalized to the target population of the QLSCD. Moreover, the complex sample design was taken into account in calculating the precision of the estimates and performing statistical tests. Unless otherwise indicated, differences indicated in the text have a threshold of statistical significance of 0.05.

Results

Changes in a positive teacher-student relationship from when the children were 6 to when they were 10 years of age (from kindergarten to Grade 4): teachers' assessment

The results obtained from teachers' responses show that a certain distance seems to grow between them and the children over time. When the children were 6 years of age (near the end of kindergarten), 68% of teachers indicated they had a warm and close relationship with them (Figure 1). This percentage gradually decreased to 47% when the children were 10 years of age (near the end of Grade 4). A similar trend was observed on the question of children spontaneously sharing information. The percentage of teachers reporting that this "Definitely applies" dropped from 54% when the children were 6 to just below 37% when they were 10 years of age. Similarly, slightly more than 48% of teachers indicated that it was easy to understand what the children were feeling when they were 6, but only 32% when the children were 10 years of age.

When asked about their feeling of being "effective and confident" in their interactions with the children, nearly 60% of teachers of the children 6 years of age reported such a feeling. This decreased to 50% of teachers when the children were, 7, 8 and 10 years of age (near the end of Grade 1, Grade 2 and Grade 4 respectively). A fairly sizeable proportion of teachers reported difficulties with regard to certain aspects of their relationship with the children. For example, in the four years under study, from 18% to 25% of teachers said they did not really feel effective and confident in their interaction with the children¹⁰ (Figure 1). In contrast, when we examine the data from a longitudinal angle, only 6% of the children had teachers who did not really feel effective and confident in their interactions with them in both Grade 1 and Grade 4 (data not shown).¹¹

18% to 25% of teachers said they did not really feel effective and confident in their relationships with students 6, 7, 8 and 10 years of age.

Note that the children generally changed teachers every year so that the teacher-student relationship was assessed by a different teacher in each round of the survey. Therefore it is possible that the changes observed in teachers' responses reflect changes in the role of the teacher between kindergarten and Grade 4, or that differences are related to characteristics of the teachers themselves. Moreover, it should be kept in mind that children develop emotionally and cognitively and this may influence teachers' assessments of their relationship with them. From this perspective, the children's assessments of changes in the teacher-student relationship over time proved particularly informative and complete the portrait of the phenomenon.

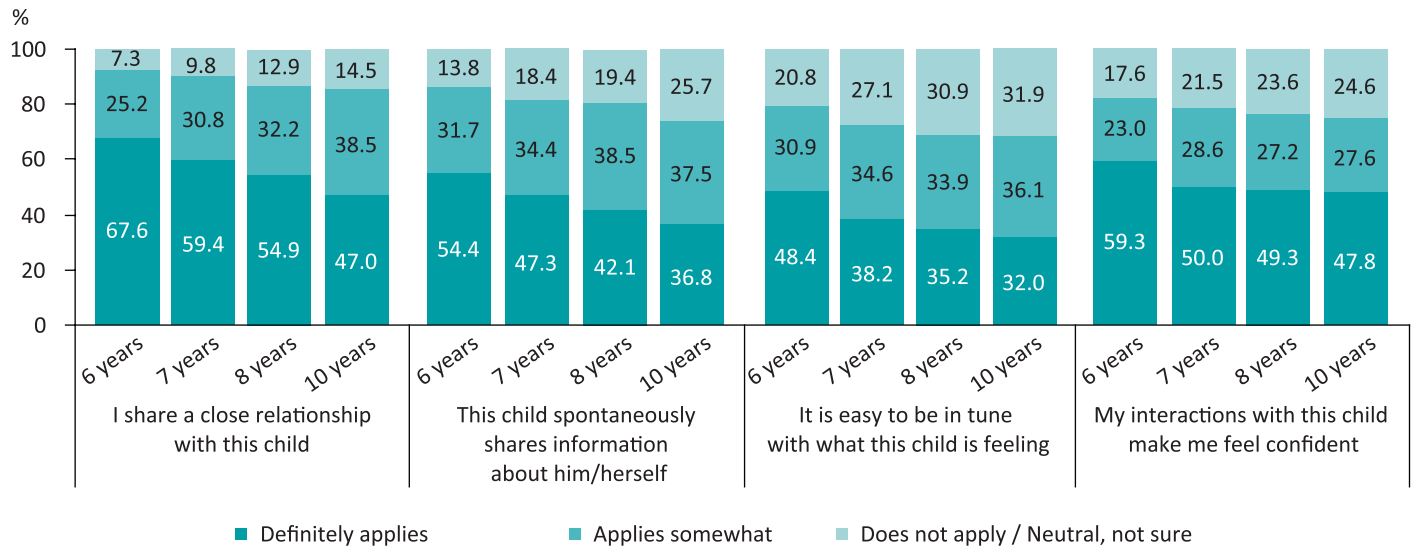
Changes in a positive teacher-student relationship from when the children were 7 to when they were 10 years of age (from Grade 1 to Grade 4): the children's assessment

Beginning in the 2005 round, when the children were a median age of 7 years, the teacher-student relationship was also assessed by the children. Examining the responses to various questions asked of the children gives an idea of what they thought about the relationship with their teacher during this period of childhood.

First, the percentage of children who responded "Often or very true" to the statement "You like your teacher" was essentially the same at 7 and 8 years of age (89% and 87% respectively), while it was 75% at 10 years of age (Figure 2). Similarly, when asked to respond to the statement "You can talk to your teacher, he/she listens and answers nicely," 80% of the children responded "Often or very true" at 7 and 8 years of age, while this proportion was 73% at 10 years of age. In addition, 72% of the children at 7 years of age said they often received congratulations from their teacher when they successfully achieved something versus 66% of children at 10 years of age. Finally, in response to the statement "You feel at ease to ask your teacher questions when there is something you don't understand," 60% of children responded this was often the case, irrespective of the age under study.

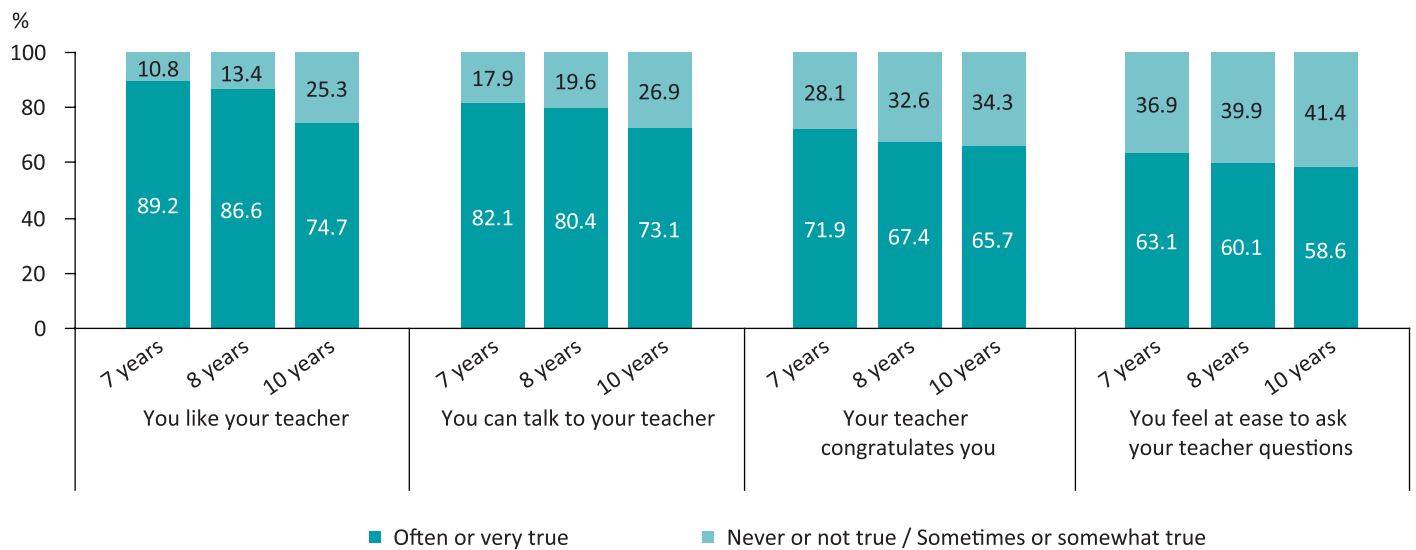
Nearly 90% of children said they liked their teacher in Grades 1 and 2 of elementary school. This proportion decreased to 75% in Grade 4.

Figure 1
Distribution of teachers by responses to statements describing a positive teacher-student relationship and children's age, Québec, 2004-2006 and 2008



Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure 2
Distribution of children by responses to statements describing a positive teacher-student relationship and children's age, Québec, 2005, 2006 and 2008



Source: Institut de la statistique du Québec, QLSCD 1998-2010.

These results are based on a series of cross-sectional analyses. Approximately 60% of children responded “Often or very true” to the statement “You like your teacher” at the ages of 7, 8 and 10 years. In contrast, only a small proportion (3%*) responded “Never or not true” or “Sometimes or somewhat true” to this statement in all the rounds under study (data not shown).

To summarize, the majority of children assessed their relationships with their teachers as very positive during the first cycle¹² of elementary school. However, a comparatively lower proportion of teachers responded positively to various questions on their relationship with the children. The next section will differentiate certain factors related to the teachers’ and children’s assessments of their relationship.

Characteristics associated with a positive teacher-student relationship as reported by the teachers

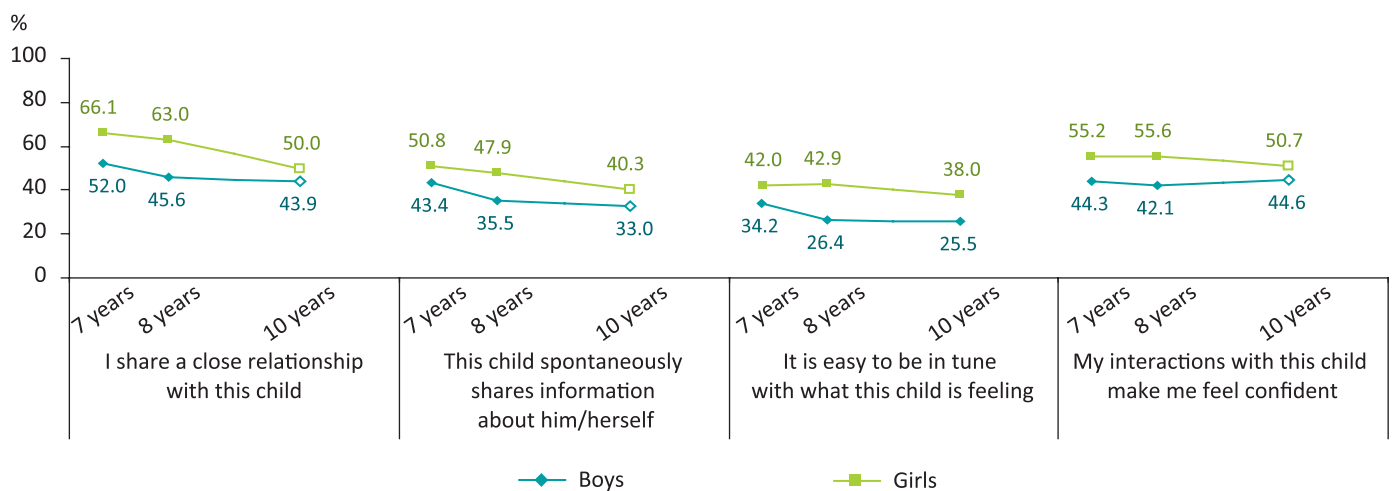
Some striking differences were observed in teachers’ responses with regards to boys versus girls. A larger proportion of teachers indicated it was easy to understand how a student was feeling when referring to girls rather than boys, irrespective of the age of the children (Figure 3).¹³ Moreover, a higher proportion of teachers assessed the teacher-student relationship as positive with regards to other aspects examined such as warm and close relationship, spontaneous sharing of information, and feeling effective and confident, when the children they were referring

to were girls rather than boys at the ages of 7 and 8 years, whereas no significant differences by sex were observed when the children were 10 years of age.

On the whole, a comparatively lower proportion of teachers indicated having a positive relationship with children from low-income households (Figure 4). Similarly, teachers of children presenting more externalizing and internalizing behaviours were less likely to indicate a positive relationship in response to the statements analyzed (Figures 5 and 6). The only exception was the assessment of spontaneously sharing information, the result indicating no association with externalized behavioural problems in the children at all ages under study nor with internalizing problems when they were 10 years of age. Figures B.1 through B.6 in Appendix B illustrate the results for each behaviour scale. These figures show that teachers of children manifesting more behaviours such as opposition, physical aggression, inattention or hyperactivity, or more emotional or anxiety problems were less likely to report feeling effective and confident in their interactions with such children, irrespective of the children’s ages (Figures B.1, B.2, B.3 and B.4 in Appendix B).

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

Figure 3
Proportion of teachers who responded favourably¹ to statements describing a positive teacher-student relationship, by child's sex, Québec, 2005, 2006 and 2008



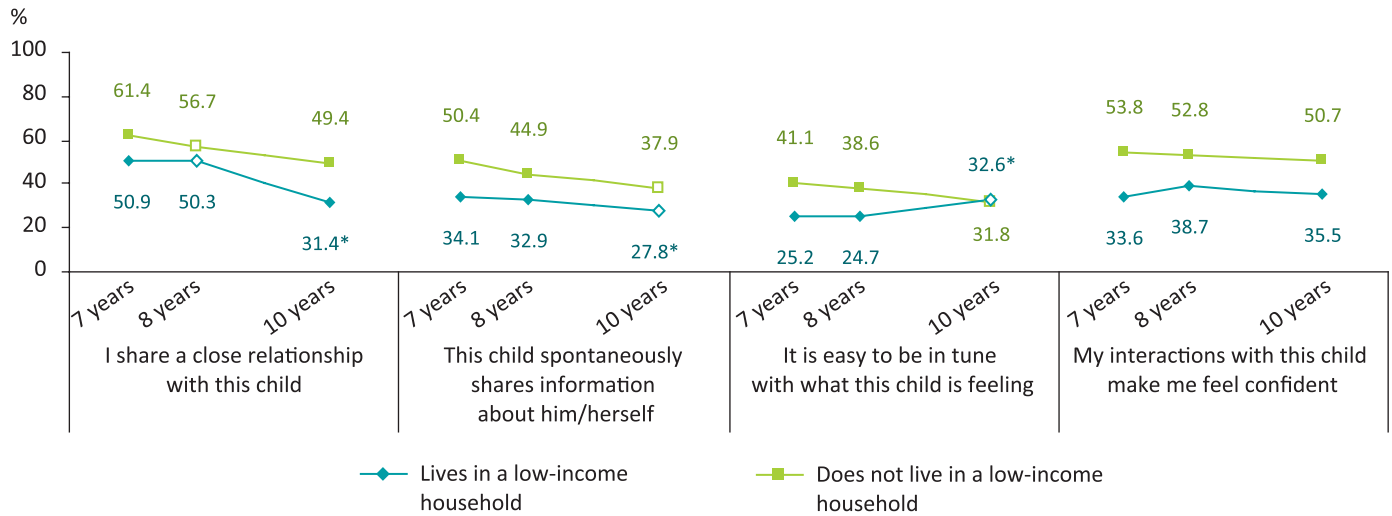
Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

1. Namely “Definitely applies”.

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure 4

Proportion of teachers who responded favourably¹ to statements describing a positive teacher-student relationship, by whether the child lives in a low-income household, Québec, 2005, 2006 and 2008



Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

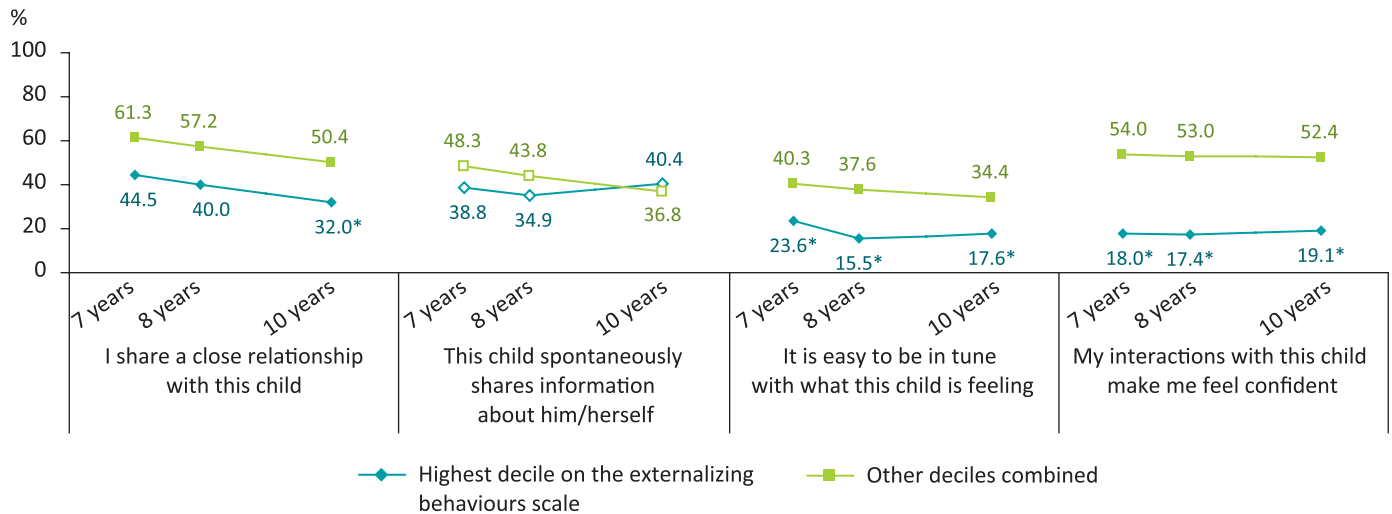
* Coefficient of variation between 15% and 25%; interpret with caution.

1. Namely "Definitely applies".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure 5

Proportion of teachers who responded favourably¹ to statements describing a positive teacher-student relationship, by decile on the externalizing behaviours scale, Québec, 2005, 2006 and 2008



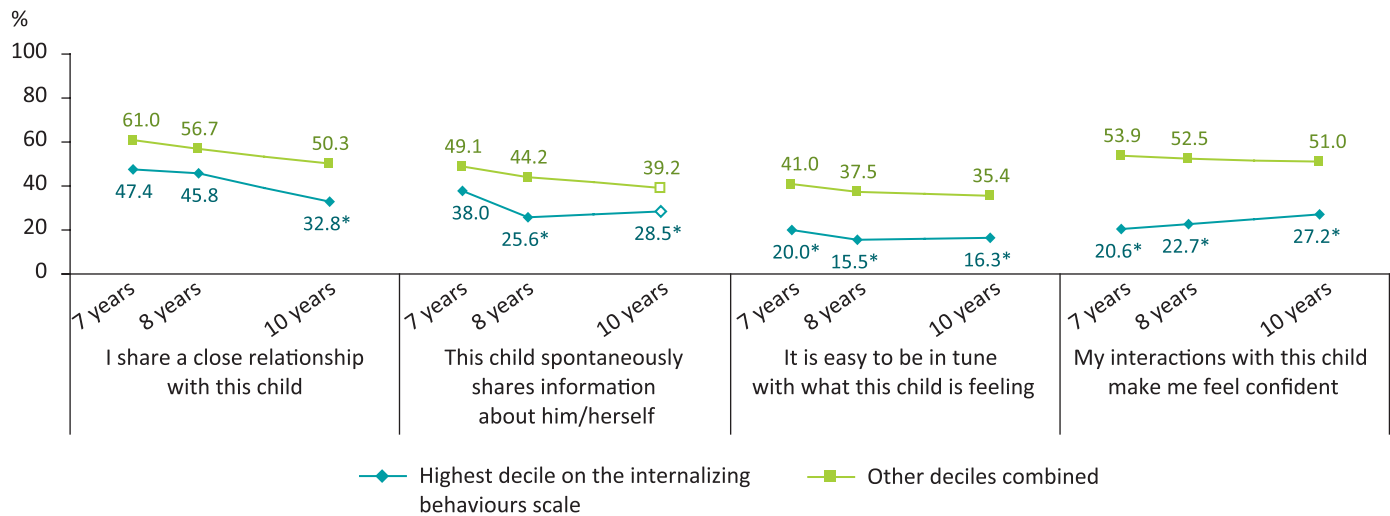
Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

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

1. Namely "Definitely applies".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure 6
Proportion of teachers who responded favourably¹ to statements describing a positive teacher-student relationship, by decile on the internalizing behaviours scale, Québec, 2005, 2006 and 2008



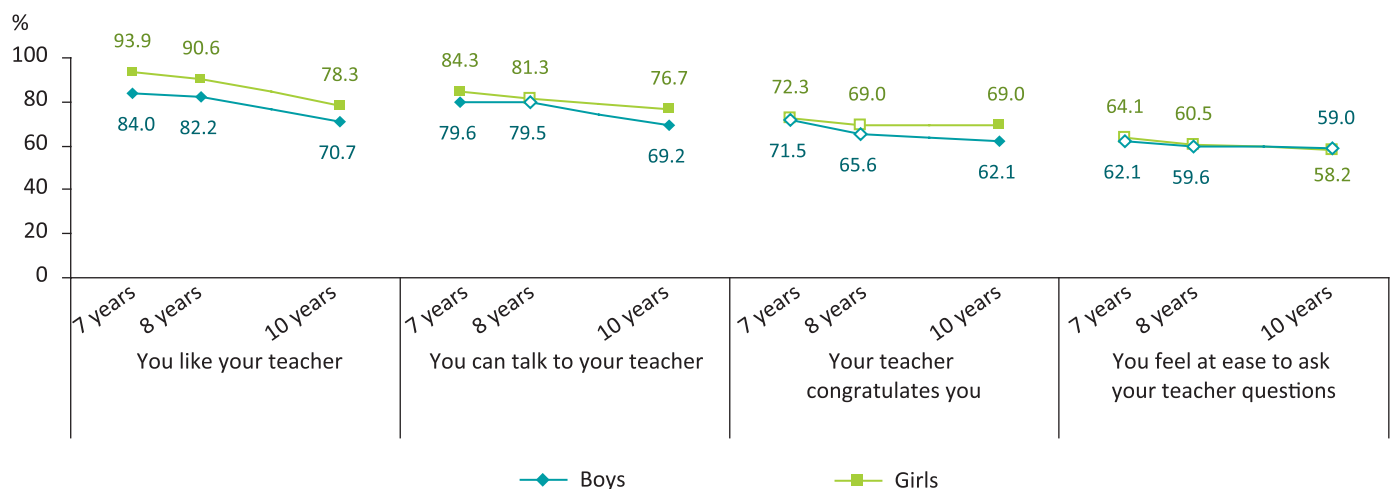
Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.
 * Coefficient of variation between 15% and 25%; interpret with caution.
 1. Namely "Definitely applies".
 Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Characteristics associated with a positive teacher-student relationship as reported by the children

Associations observed between the teachers' assessments and children's characteristics were echoed in part by the children's assessments. For example, irrespective of their age, girls were more likely than boys to report liking their teacher (Figure 7). In contrast, other differences were observed only at certain ages. In addition, girls were not more likely than boys to report being at ease with asking their teacher questions.

Compared to the teachers' assessments, the children's assessments of their relationship with their teacher differed little or not at all with regards to their parents' household income level. However, children from low-income households were less likely than other children to report liking their teacher when they were 8 and 10 years of age (Figure 8).

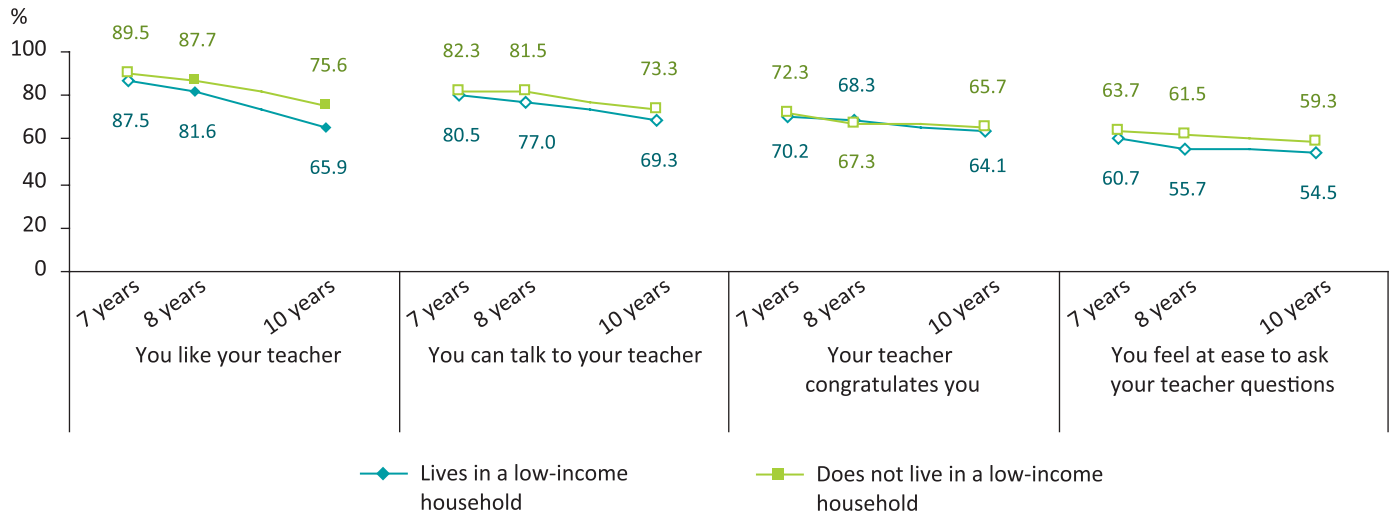
Figure 7
Proportion of children who responded favourably¹ to statements describing a positive teacher-student relationship, by child's sex, Québec, 2005, 2006 and 2008



Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.
 1. Namely "Often or very true".
 Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure 8

Proportion of children who responded favourably¹ to statements describing a positive teacher-student relationship, by whether the child lives in a low-income household, Québec, 2005, 2006 and 2008



Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

1. Namely "Often or very true".

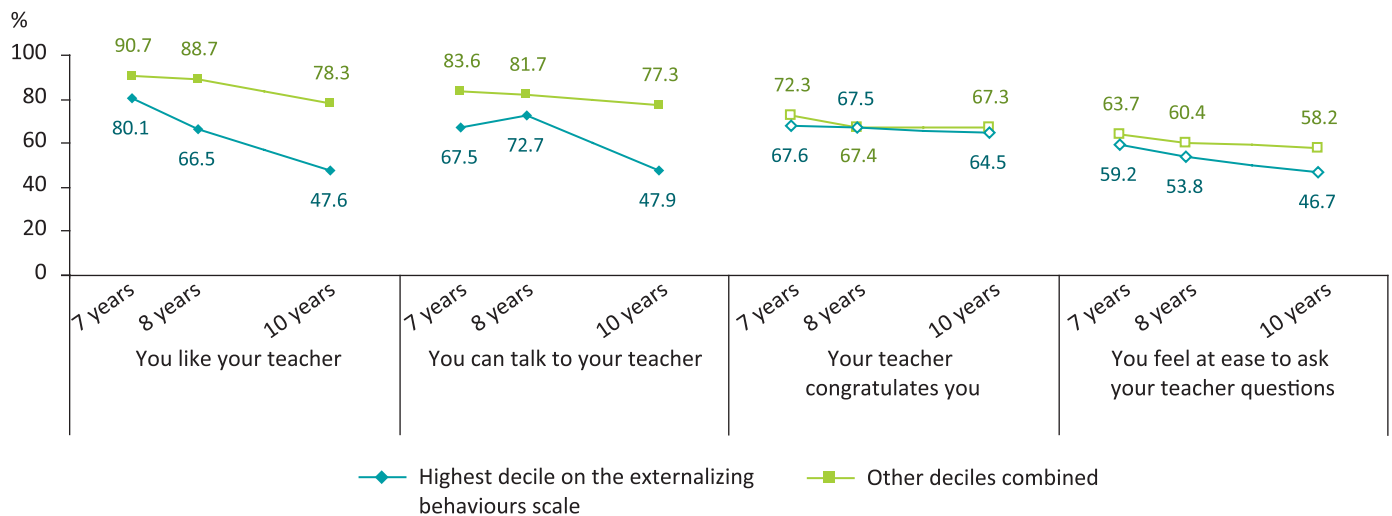
Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Children who manifested more externalizing behaviour problems, irrespective of their age, were less likely to report liking their teacher or being able to talk to her (Figure 9). Similarly, but only at the age of 10 years, children manifesting more internalizing behaviours were less likely to say they liked their teacher, were able to talk to her, or feel at ease in asking her questions (Figure 10). Figures B.7 through B.12 in Appendix B

present the children's assessments of each statement as a function of specific externalizing and internalizing behaviours. We can see that with some exceptions, children with more externalizing behaviours such as opposition, physical aggression, inattention or hyperactivity, were less likely to report liking their teacher and being able to talk to her.

Figure 9

Proportion of children who responded favourably¹ to statements describing a positive teacher-student relationship, by decile on the externalizing behaviours scale, Québec, 2005, 2006 and 2008

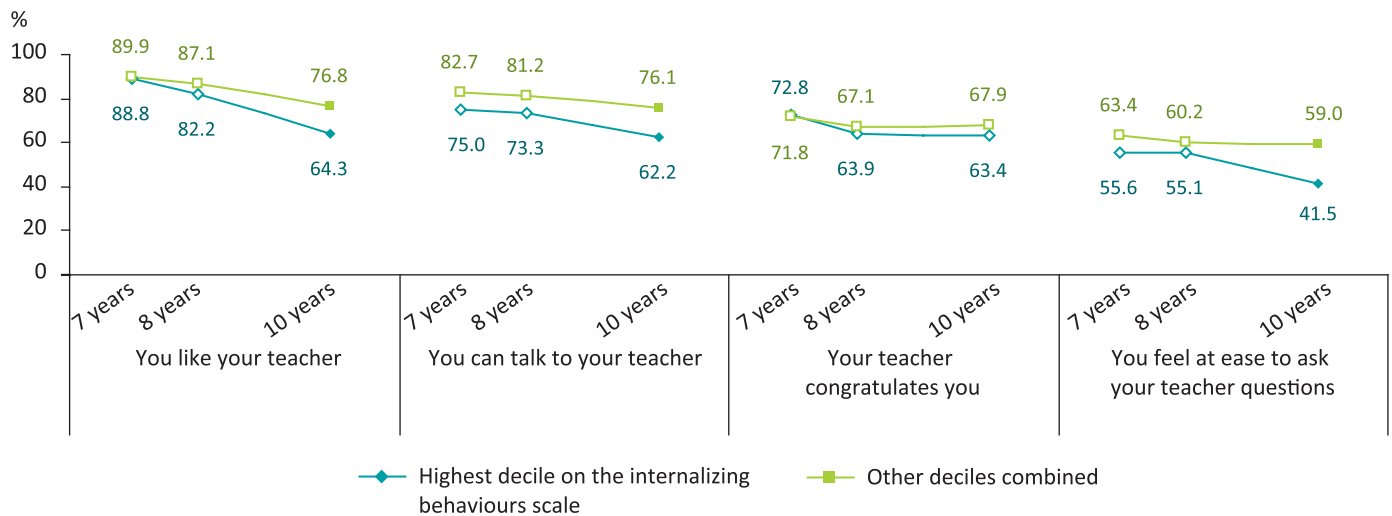


Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

1. Namely "Often or very true".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure 10
Proportion of children who responded favourably¹ to statements describing a positive teacher-student relationship, by decile on the internalizing behaviours scale, Québec, 2005, 2006 and 2008



Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

1. Namely "Often or very true".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Characteristics of children having the greatest influence on a positive teacher-student relationship in Grade 4

In general, teachers had a lower assessment of certain aspects of a positive relationship with their students in terms of boys compared to girls and children they perceived as having more externalizing and internalizing behavioural problems. With regards to the children's assessments, a majority had a very favourable view of positive aspects of their relationship with their teacher irrespective of their characteristics, particularly at 7 and 8 years of age (near the end of Grades 1 and 2 respectively). However, their assessment was slightly less positive at the age of 10 (near the end of Grade 4).

It should be emphasized that the analyses presented up to this point have shed light on the associations between a positive teacher-student relationship and a number of characteristics of the children examined separately. However, certain characteristics were associated with each other.



For example, the child's sex was associated with externalizing behavioural problems (data not shown). It is therefore difficult to establish their singular contribution to a positive teacher-student relationship. To ferret out associations among various child characteristics and the teacher-student relationship when the children were 10 years of age, logistic regressions were conducted for responses to each item by both the teachers and the children.¹⁴ Since the item "Your teacher congratulates you when you do well in something" had little association with any variables in the bivariate analyses, it was not included in subsequent analyses.

Table 1 shows that, all things being equal, teachers were more likely to describe their relationship as warm and close with children who did not come from a low-income household and who did not have a high level of externalizing behaviour problems. With regards to the statement "This child spontaneously shares information about him/herself," teachers were also more likely to respond positively for children who were girls and who were not living in a low-income household. Teachers were more likely to respond "Definitely applies" to the statement "It is easy to be in tune with what this child is feeling" with regards to girls and children manifesting fewer internalizing behavioural problems. A similar trend was observed for externalizing problems. In addition, three characteristics independently contributed to teachers' responses to "My interactions with this child make me feel effective and confident." These were the children's household income level, externalizing, and internalizing behaviour problems. Teachers were more likely to respond "Definitely applies" to this statement for children not living in a low-income household, and not manifesting a high level of externalizing or internalizing behaviour problems.

On examining children's assessments, we see that girls and those who had fewer or no externalizing or internalizing behaviour problems were more likely to respond "Often or very true" to the statement "You like your teacher." This trend was also observed for children not living in a low-income household (Table 2). Children manifesting relatively fewer externalizing or internalizing behaviours were also more likely to say they

could often talk to their teacher and that their teacher would listen to them and respond to them in a pleasant manner. Children with relatively fewer internalizing behaviour problems were also significantly more likely to respond “Often or very true” to the statement “You feel at ease to ask your teacher questions when there is something you don’t understand.”

In general, the results of multivariate analyses revealed that teachers’ assessment of their relationship with the child was strongly associated with the socioeconomic status of the child’s household. However, for the most part, the children’s assessment did not match this. In addition, with the exception of teachers’ responses to the statement “This child spontaneously shares information about him/herself,” all statements on a positive teacher-student relationship, whether assessed by the teachers or the children, were associated with the child manifesting externalizing or internalizing behavioural problems.

In order to identify which specific behavioural problems in the children were associated with assessments of the teacher-student relationship, each externalizing and internalizing behaviour was entered separately into the same type of model. These were hyperactivity, inattention, physical aggression, opposition, emotional problems and anxiety.¹⁵ Analyses were

conducted only on the three items for which the two types of behaviours contributed individually to predicting the assessment of the relationship, namely the feeling of being effective and confident on the part of the teacher, the fact that the child liked his/her teacher, and that the child could talk to his/her teacher. After the other characteristics were entered in the model, the analyses revealed that only inattention and emotional problems were significantly associated with the teacher’s feeling of being effective and confident (data not shown). With regards to the children, hyperactivity and emotional problems were the characteristics at play in the model. Children manifesting fewer hyperactivity behaviours at the age of 10 years were significantly more likely to say they liked their teacher or could talk to her. At this same age, children with fewer emotional problems were also more likely to report being able to talk to her (data not shown).

When the children were at a median age of 10 years, both their assessments and their teachers’ assessments of certain aspects of their relationship were strongly associated with children manifesting externalizing or internalizing behaviour problems, namely hyperactivity, inattention and emotional problems.

Table 1
Associations between various characteristics of children at 10 years of age¹ and teachers’ assessments of a positive teacher-student relationship, multiple logistic regression models, Québec, 2008

	Model 1 I share a close relationship with this child	Model 2 This child spontaneously shares information about him/herself	Model 3 It is easy to be in tune with what this child is feeling	Model 4 My interactions with this child make me feel confident
	Odds ratio ^{2,3}			
Child’s sex				
<i>Boy</i>	1.00	1.00	1.00	1.00
Girl	1.24	1.42 [†]	1.66 ^{††}	1.11
Low-income household				
<i>Yes</i>	1.00	1.00	1.00	1.00
No	2.29 ^{††}	1.83 [†]	1.09	1.79 [†]
Externalizing behaviours				
<i>Highest decile</i>	1.00	1.00	1.00	1.00
Other deciles combined	1.79 [†]	0.73	1.81 [†]	4.37 ^{†††}
Internalizing behaviours				
<i>Highest decile</i>	1.00	1.00	1.00	1.00
Other deciles combined	1.01	1.25	1.78 [†]	2.30 ^{††}

1. Children born in Québec 1997-1998.

2. The reference category is in italics. An odds ratio higher than 1 indicates that the teachers of children manifesting a given characteristic were more likely to respond “Definitely applies” compared to other responses to the item in question, whereas an odds ratio lower than 1 indicates they were less likely to do so.

3. Odds ratio significantly different from 1 at the threshold of: †: 0.10; ††: 0.05; †††: 0.01; ††††: 0.001.

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Table 2
Associations between various characteristics of children at 10 years of age¹ and children's assessments of a positive teacher-student relationship, multiple logistic regression models, Québec, 2008

	Model 1 You like your teacher	Model 2 You can talk to your teacher	Model 3 You feel at ease to ask your teacher questions
	Odds ratio ^{2,3}		
Child's sex			
<i>Boy</i>	1.00	1.00	1.00
Girl	1.50 [†]	1.31	0.89
Low-income household			
<i>Yes</i>	1.00	1.00	1.00
No	1.60 [‡]	1.34	1.14
Externalizing behaviours			
<i>Highest decile</i>	1.00	1.00	1.00
Other deciles combined	2.12 ^{††}	2.23 ^{††}	1.22
Internalizing behaviours			
<i>Highest decile</i>	1.00	1.00	1.00
Other deciles combined	2.08 ^{††}	1.71 [†]	2.51 ^{†††}

1. Children born in Québec 1997-1998.
 2. The reference category is in italics. An odds ratio higher than 1 indicates that children with a given characteristic were more likely to respond "Often or very true" rather than "Never or not true" to the item in question, whereas an odds ratio lower than 1 indicates they were less likely to do so.
 3. Odds ratio significantly different from 1 at the threshold of: ‡: 0.10; †: 0.05; ††: 0.01; †††: 0.001.
- Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Box 2

Does having a female or male teacher make a difference in the assessment of the teacher-student relationship?



Fewer than 5% of children 6, 7 and 8 years of age in the target population of the QLSCD had a male teacher, whereas this proportion increased to 10% for children at the age of 10 in which the majority of children were near the end of Grade 4 in elementary school (data not shown). Did having a male or female teacher make a difference? To explore this question, responses to the eight items on the teacher-student relationship were examined to see if any varied by the sex of the teacher

when the children were 10 years of age. Bivariate analyses revealed that compared to their female colleagues, fewer male teachers indicated that the statement "I share a close and warm relationship with this child" definitely applied to their relationship with the child (36%* vs. 48%). By the same token, a lower percentage of children said they felt at ease asking their teacher questions when the teacher was male compared to female (44% vs. 58%; data not shown). It would have been interesting to see whether these associations were observed for boys compared to girls. However, the small numbers of male teachers made it impossible to conduct more detailed analyses based on the sex of the teacher.

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

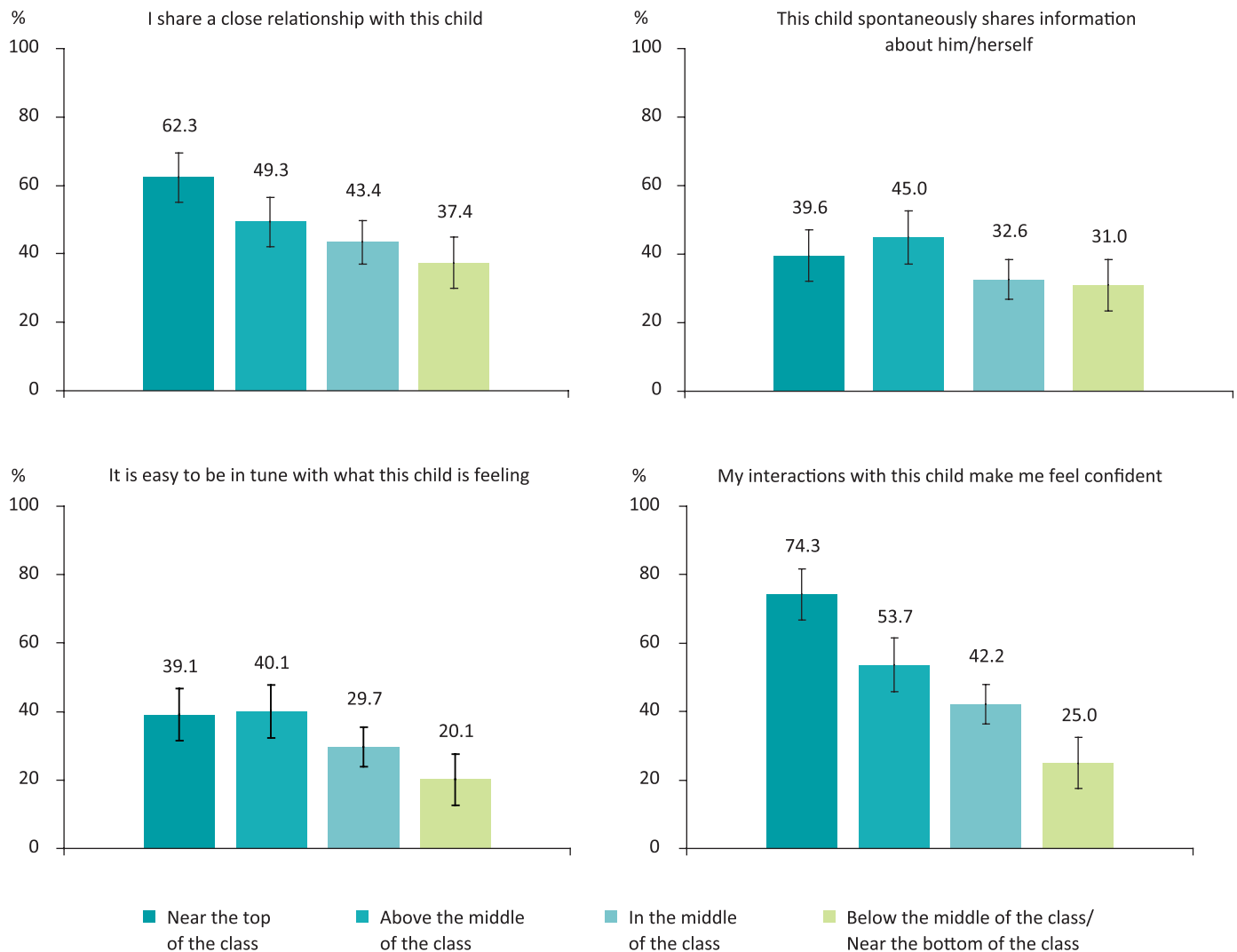
Does a positive teacher-student relationship contribute to academic achievement?

A number of studies have shown that a positive teacher-student relationship can contribute to academic achievement (Hamre and Pianta, 2001; Pianta and Stuhlman, 2004). In this regard, the QLSCD data showed an association between teachers' assessments of their relationship with the child and the latter's teacher-assessed academic performance from the age of 7 to 10 years (Figure 11 and Tables B.1, B.2 and B.3). This was observed for all statements studied. However, with regards to the children's assessments, it was only at the age of 10 years, when the majority were in Grade 4, that such an association was observed (Figure 12). Therefore, compared to children whose academic performance was described by the teachers as being in the middle or below the middle of the class, children whose teachers said they were near the top of the class were more likely to report they liked their teacher or felt at ease asking her questions.

In general, children rated by their teacher as being either in the middle or below the middle, including near the bottom of the class, showed no difference in terms of their assessment of their relationship with their teacher (Figure 12). However, as illustrated in the gradient in Figure 11 and Tables B.1, B.2 and B.3, teachers were less likely to report feeling effective and confident with children whose academic performance was rated as being "below the middle of the class" or "near the bottom of the class" compared to those who were "in the middle of the class," irrespective of the age of the children under study. Moreover, teachers of children who were judged to be "in the middle of the class" were less likely to say they were effective and confident compared to teachers of children judged to be "near the top of the class." (Figure 11 and Tables B.1, B.2 and B.3).

Figure 11

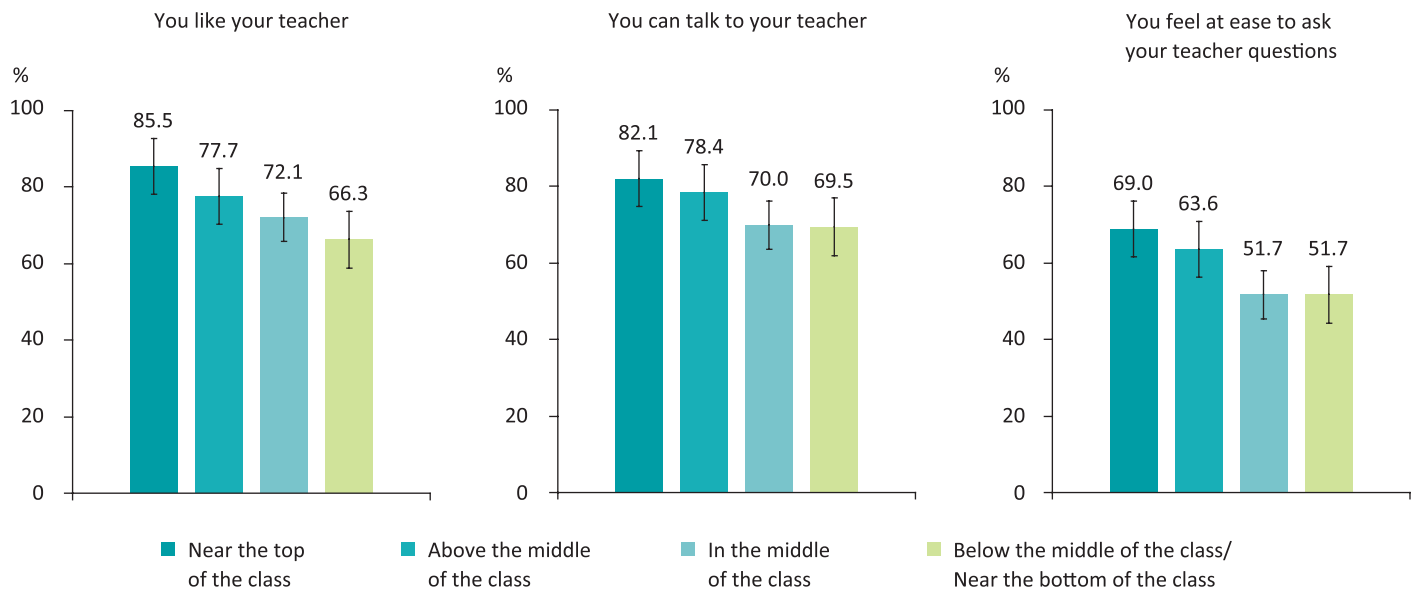
Proportion of teachers who responded favourably¹ to statements describing a positive teacher-student relationship, by the child's overall academic achievement at the age of 10 years, Québec, 2008



1. Namely "Definitely applies".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure 12
Proportion of children who responded favourably¹ to statements describing a positive teacher-student relationship, by their overall academic achievement at the age of 10 years, Québec, 2008



1. Namely "Often or very true".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Since the assessment of a positive teacher-student relationship on the part of either party was not independent of the child's individual or family characteristics, we wished to examine, when the children were 10 years of age, whether associations between the relationship and teacher-reported academic performance persisted when the child's sex, household income and externalizing and internalizing behaviours were taken into account. Would the teacher-student relationship still be associated with teacher-reported academic performance? More precisely, could it predict a child's classification in the medium/strong group ("in the middle of the class," "above the middle of the class" and "near the top of the class") rather than in the weak group ("below the middle of the class" and "near the bottom of the class"), beyond the child's individual and family characteristics?

Teachers' feeling of being effective and confident was positively associated with overall academic performance when the children were 10 years of age, even while taking into account the child's sex, household income level and behavioural problems.

Table 3 (Model 1) shows that after other characteristics were taken into account, the fact that a teacher indicated "Definitely applies" to the statement "My interactions with this child make me feel effective and confident" increased the odds that children would be in the medium/strong group at the age of 10 years. A similar trend was observed for "It is easy to be in tune with what this child is feeling" ($p = 0.08$).

In contrast, when we examined the children's assessments, neither the fact of liking their teacher, being able to talk to her or feeling at ease to ask her questions contributed individually to predicting teacher-assessed academic performance, aside from the other variables (Table 3, Model 2).

Two QLSCD data collection instruments, a modified version of the arithmetic test CAT/2 and the Peabody Picture Vocabulary Test (PPVT) provided a means of evaluating the children's academic achievement in a more objective manner when they were 10 years of age. Similar to the method used for overall academic performance, in this case using linear regression models, we wanted to see to what degree having a good relationship with the teacher was associated with the results of the aforementioned tests, aside from other characteristics.

The results showed that no statement on the teacher-student relationship assessed by the teachers or children was associated with the children's performance on these tests when taking other characteristics into account. Only household income level contributed to predicting performance on the PPVT, while both income level and externalizing and internalizing behaviour problems independently contributed to predicting performance on the CAT/2 (data not shown).

Table 3

Associations between statements describing a positive teacher-student relationship and the child's overall academic performance at 10 years of age¹ as assessed by the teacher, given certain characteristics of the child, multiple logistic regression models, Québec, 2008²

	Overall academic performance average or higher	
	Model 1	Model 2
	Odds ratio ^{3,4}	
Child's sex		
<i>Boy</i>	1.00	1.00
<i>Girl</i>	0.82	0.85
Low-income household		
<i>Yes</i>	1.00	1.00
<i>No</i>	2.10 ^{††}	2.15 ^{††}
Externalizing behaviours (teacher-reported)		
<i>Highest decile</i>	1.00	1.00
<i>Other deciles combined</i>	4.24 ^{†††}	5.01 ^{†††}
Internalizing behaviours (teacher-reported)		
<i>Highest decile</i>	1.00	1.00
<i>Other deciles combined</i>	2.23 ^{††}	2.46 ^{†††}
I share a close relationship with this child (teacher-reported)		
<i>Definitely applies</i>	0.77	
<i>Other responses combined</i>	1.00	
This child spontaneously shares information about him/herself (teacher-reported)		
<i>Definitely applies</i>	0.91	
<i>Other responses combined</i>	1.00	
It is easy to be in tune with what this child is feeling (teacher-reported)		
<i>Definitely applies</i>	1.57 [†]	
<i>Other responses combined</i>	1.00	
My interactions with this child make me feel confident (teacher-reported)		
<i>Definitely applies</i>	2.62 ^{†††}	
<i>Other responses combined</i>	1.00	
You like your teacher (child-reported)		
<i>Often or very true</i>		1.32
<i>Never or not true</i>		1.00
You can talk to your teacher (child-reported)		
<i>Often or very true</i>		0.86
<i>Never or not true</i>		1.00
You feel at ease to ask your teacher questions (child-reported)		
<i>Often or very true</i>		1.10
<i>Never or not true</i>		1.00

1. Children born in Québec 1997-1998.

2. No multicollinearity problem was detected in any of the models shown.

3. The reference category is in italics. An odds ratio higher than 1 indicates that children with a given characteristic were more likely to respond "Often or very true" rather than "Never or not true" to the item in question, whereas an odds ratio lower than 1 indicates they were less likely to do so.

4. Odds ratio significantly different from 1 at the threshold of: ‡: 0.10; †: 0.05; ††: 0.01; †††: 0.001.

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Discussion and conclusions



The aim of this fascicle was to analyze certain aspects of the teacher-student relationship in elementary school in order to gain a better understanding of any changes over time and to examine associated factors. The QLSCD is the first large-scale Québec survey that has studied both children's and teachers' assessments of their relationship. Their perceptions were analyzed in parallel for the first few years of elementary school and then in association with various child characteristics such as sex, household income and externalizing and internalizing behaviour problems. Special attention was then given to associations between academic performance and the teacher-student relationship. Discussion of the major findings follows.

Changes in the teacher-student relationship over time

In early elementary school, the majority of teachers and children responded favourably to various aspects assessing a positive relationship. However, overall, this tended to decrease with the age of the children, on the part of both teachers and children. This could be attributed in part to changes in the emotional needs and cognitive skills of the children and the role of the teacher. At the beginning of elementary school, children tend to view their teacher as a substitute parental figure of attachment, generally resulting in a very positive assessment of this person (Lynch and Cicchetti, 1997). With regards to cognitive development, the capacity for self-assessment and that of others begins to be more refined during this period, which may also contribute to explaining changes in children's perception of their relationship with their teacher (Bee and Boyd, 2008). Furthermore, children gain greater academic experience over time. They can compare their relationship with different teachers and possibly become more critical.

Regarding teachers, their teaching methods and expectations considerably vary with the grade level. In kindergarten and the first few years of elementary school, their teaching is focused on the development of social and emotional skills in children, whereas as the years progress through grade levels, academic demands weigh in to the point where they predominate. It should also be kept in mind that the teacher-student relationship in our longitudinal survey was assessed by a different teacher in each round, since the children progressed through grade levels and generally changed teachers as a result.

Children's characteristics associated with a positive teacher-student relationship

Differences in the relationship were observed in comparing boys to girls. Bivariate analyses revealed that teachers were more likely to report warm and close relationships with girls rather than boys in kindergarten and early elementary school. This was also observed when the children were 10 years of age with regards to teachers' understanding what the child was feeling and the child's spontaneous sharing of information, even when other factors such as household income level, and externalizing and internalizing behaviours were entered in the model. Furthermore, girls were more likely than boys to say they liked their teacher, and even when other variables were taken into account, this was still the case at the age of 10 years.

These findings confirm a general observation in the scientific literature that girls have a better relationship with their teachers compared to boys (Baker, 2006; Blankemeyer, Flannery and Vazsonyi, 2002; Howes, Phillipson and Peisner-Feinberg, 2000). This can be explained by a number of factors. Child development in girls is marked by them being more attentive and sensitive to social and relational stimuli (Brown and Gilligan, 1992), which can facilitate a positive emotional relationship with their teachers in the first few years of formal schooling. In contrast, at school entry, boys tend to manifest more disruptive behaviours and less developmental maturity than girls (Alexander and Entwisle, 1988; Kesner, 2000). These behaviours can lead to interactions with the teacher characterized by conflict and negatively influence the teacher-student relationship (Baker, 2006; Hamre and Pianta, 2001). Moreover, differences based on the child's sex could be accentuated by the fact that the vast majority of teachers in early elementary school are female. Therefore women teachers could feel closer to girls than to boys and more at ease in interacting with them. Unfortunately, QLSCD data did not provide a means of exploring this hypothesis in detail.

Positive aspects of the teacher-student relationship were also associated with the income level of the child's household. Compared to those living in a low-income household, other children were significantly more likely to report liking their teachers in Grade 2, and a trend in this regard was observed when the children were 10 years of age at the end of Grade 4, even when other variables were taken into account. Similarly, teachers were more likely to report having a more positive relationship with children who were not living in a low-income household. This was the case for the majority of statements assessing a positive teacher-student relationship when the children were 10 years of age, even when the child's sex and behavioural problems were taken into account. These results could in part be attributed to the fact that children from families in poverty are more likely to present lower academic performance (Brooks-Gunn and Duncan, 1997). Indeed, a number of studies have shown that teachers have less positive relationships with children from low-income families (Baker, 2006; Birch and Ladd, 1997; Hamre and Pianta, 2001; Ladd et al., 1999). These findings are worrisome given that students from disadvantaged families who experience welcoming and helpful relationships with their teachers early in school have a more positive perception of their school environment (Baker, 1999).

With regards to externalizing and internalizing behaviour problems, our results revealed that they were generally associated with less favourable assessments of aspects of a positive teacher-student relationship. These findings corroborate those of other studies in which students with more externalizing or internalizing behaviours have lower quality relationships with their teachers (Baker, 2006; Henricsson and Rydell, 2004; Maldonado-Carreño, 2005; Murray and Murray, 2004). Here again, this observation raises certain questions. Many studies show that children with behavioural problems who have a warm relationship with their teachers at school entry (Hamre and Pianta, 2001; Hughes, Cavell and Jackson, 1999), will demonstrate a greater capacity for adjustment and do better academically. Therefore, establishing significant relationships with non-family adults can provide a means for vulnerable children to acquire social and behavioural skills needed for development and the maintenance of school engagement (Hughes, Cavell and Wilson, 2001; Lynch and Cicchetti, 1992; Pianta, 1999).

Overall, these findings underline the importance of intervening with vulnerable children and their teachers in order to foster the development of a positive teacher-student relationship right from school entry (Pederson, Faucher and Eaton, 1978; Werner and Smith, 1989).

Positive teacher-student relationships and academic achievement

Associations between the three academic achievement outcome variables and the children's characteristics and a positive teacher-student relationship were analyzed for when the children were a median 10 years of age. The outcome variables were the teachers' perception of overall academic performance and the results of two cognitive tests, the PPVT and CAT/2 administered by an interviewer. Bivariate analyses revealed a strong association between the teachers' assessment of academic performance and their assessment of the teacher-student relationship. This was observed among teachers irrespective of the children's age, whereas on the part of children, it was only observed when they were 10 years of age.

Multivariate analyses resulted in a more nuanced portrait. After simultaneously entering into the model statements on the teacher-student relationship, child's sex, child's household income level and behavioural problems observed by the teacher at the age of 10 years, only the teacher's feeling of being effective and confident, and to a much lesser degree, the teacher's capacity to understand what the child was feeling, contributed separately to predicting academic performance at that age. Our findings therefore suggest that beyond characteristics such as low household income and externalizing or internalizing behaviours, only certain aspects of a positive teacher-student relationship seem associated with a child's academic achievement. However, these results are based on both the teachers' assessment of their relationship with the child and the latter's academic performance, with could lead to a certain bias.

In this regard, analyses based on the cognitive PPVT and CAT/2 tests revealed that no statement on a positive teacher-student relationship, whether assessed by the teachers or the children, was associated with the children's performance in these tests, when child characteristics were entered into the model.

The fact that the teacher's feeling of effectiveness and confidence was a predictive factor in terms of teacher-assessed academic performance of the child, but not for the results of the cognitive tests, could be attributed to a certain subjectivity because academic performance was assessed by the teacher herself. However, academic performance may not only be related to children's cognitive skills but to other aspects not covered here, such as classroom and school motivation and engagement, which can be associated with teachers' feeling of effectiveness and confidence (see for example Daniels, Kalkman and McCombs, 2001; Seifert, 2004). Furthermore, since the assessment of the teacher-student relationship was conducted at the same time as the assessment of the child's academic performance, it is difficult to determine the direction of the association between the two. The transactional model of Sameroff (2010) provides a means of gaining a better understanding of the association between the teachers' feeling of being effective and confident and their assessment of the children's academic performance. According to the model, teachers of more engaged and more academically successful students can feel more competent and effective in their role. In turn, this feeling of effectiveness can inspire greater engagement in a student and contribute to his/her academic performance. By the same token, a teacher faced with a student presenting behavioural problems can feel less effective as a teacher. This can lead to less investment on the part of the child in the learning process and be reflected in his/her academic performance (Sutherland and Oswald, 2005). Other studies have shown that the teachers' self-efficacy can be strongly associated with students' academic performance (Goddard, Hoy and Hoy, 2000). According to Bandura (1997), the feeling of self-efficacy refers to an individual's beliefs with regards to his capacity to accomplish a task or not. Therefore, a teacher's belief in being able to help students can have an impact on his/her relationship with them, and in turn on their engagement and academic performance.

It should be emphasized that 18% to 25% of teachers said they did not really feel effective and confident in their interactions with the children in our analysis. Given that this feeling was strongly associated with the children's characteristics, particularly behavioural problems, how can we increase the feeling of competence among teachers while fostering academic achievement among the greatest number of students? One way would be to help teachers develop a variety of strategies adapted to the particular challenges certain children present (Webster-Stratton, Reid and Hammond, 2004). This could be accomplished through professional development seminars or the implementation of professional support measures. With regards to the students, early intervention programs fostering behavioural and emotional self-regulation as well as social and cognitive skills could help them overcome the challenge of establishing what constitutes a positive teacher-student relationship (Blacher et al., 2009). In Québec, for example, participation in programs targeting the development of positive social behaviours (*Fluppy*, CPÉQ, 1995) or

promoting mental health (*Zippy's Friends*; Denoncourt, 2007) have been associated with significant improvements in adjustment mechanisms as well as social and behavioural skills (Mishara and Ystgaard, 2006; Poulin et al., 2010). It could be helpful and productive, therefore, to provide support to teachers as well as children in the early years of schooling in order to foster positive relationships between them. This will also likely result in improvements in academic outcomes.

This fascicle is but a first step in the analysis of the teacher-student relationship. Further research could focus on conflict in this relationship, which was also addressed in QLSCD data collection instruments. Aspects of a positive teacher-student relationship and its correlates were only examined in the first few years of elementary school. It would be of great interest to study the impact of the teacher-student relationship on children's academic performance and motivation, as well as school and classroom engagement, over the long term.



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APPENDIX A

Assessment of behaviours and academic performance in Grades 1, 2 and 4 of elementary school

Teacher-assessed externalizing behaviours (children 7, 8 and 10 years of age)

The externalizing behaviour problems scale is a composite scale based on four scales analyzing physical aggression, hyperactivity, inattention and opposition in the 2005, 2006 and 2008 rounds of the QLSCD when the children were median ages of 7, 8 and 10 years respectively (Grades 1, 2 and 4). The data were based on responses to the *Self-Administered Questionnaire for the Teacher* (SAQT). In all the questions it was indicated to teachers to base their responses on the six months preceding the survey. The four scales used to calculate the composite externalizing behaviours scale are described below. For more details on the sources of these scales, the reader can refer to technical documents (in French only) available on the QLSCD website at www.iamillbe.stat.gouv.qc.ca/doc_tech_an.htm.

Hyperactivity and inattention

Hyperactivity and inattention behaviours were assessed in nine questions on the *Self-Administered Questionnaire for the Teacher* (SAQT). The teacher was asked how often during the past six months the child: “1) could not sit still, was restless and hyperactive; 2) couldn’t stop fidgeting; 3) was impulsive, acted without thinking; 4) had difficulty waiting for his/her turn in games; 5) couldn’t settle down to do anything for more than a few moments; 6) was unable to wait when someone promised him/her something; 7) was unable to concentrate, could not pay attention for long; 8) was easily distracted, had trouble sticking to any activity; 9) was inattentive.” The response choices were: “1) Never or not true; 2) Sometimes or somewhat true; 3) Often or very true.” Based on responses to these questions, two scales were constructed for QLSCD rounds in which the data was available. The hyperactivity scale was based on the first six items and the inattention scale on the remaining three. Scores were calculated on a scale ranging from 0 and 10. The Cronbach alphas were around 0.89 for the hyperactivity and inattention scales (children 7, 8 and 10 years of age).

Physical aggression

To assess the children’s level of physical aggression, the teacher was asked how often during the past six months the child: “1) got into fights; 2) encouraged other children to pick on a particular child; 3) reacted in an aggressive manner when teased; 4) tried to dominate other children; 5) reacted in an aggressive manner when contradicted; 6) scared other children to get what he/she wanted; 7) when somebody accidentally hurt him/her (such as by bumping into him/her), he/she reacted with anger and fighting; 8) physically attacked people; 9) hit, bit or kicked other children; 10) reacted in an aggressive manner when something was taken away from him/her.” The response choices were: “1) Never or not true; 2) Sometimes or somewhat true; 3) Often or very true.” Based on responses to these questions, scores were calculated on a scale ranging from 0 and 10. The Cronbach alphas were around 0.92 (children 7, 8 and 10 years of age).

Opposition behaviours

To assess opposition behaviours, the teacher was asked how often during the past six months the child: “1) was defiant or refused to comply with adults’ requests or rules; 2) didn’t seem to feel guilty after misbehaving; 3) punishment didn’t change his/her behaviour; 4) had temper tantrums or hot temper.” The response choices were: “1) Never or not true; 2) Sometimes or somewhat true; 3) Often or very true.” Based on responses to these questions, scores were calculated on a scale ranging from 0 to 10. The Cronbach alphas were around 0.83 (children 7, 8 and 10 years of age).

For each survey round analyzed, a composite scale of externalizing behaviours was calculated from the averages of the scores obtained on the four aforementioned scales. The composite scale for each round under study presented a satisfactory level of internal consistency (Cronbach alphas ranging from 0.83 to 0.85 according to the survey round).

Internalizing behaviour problems as assessed by the teacher (children were 7, 8 and 10 years of age)

The internalizing behaviour problems scale is a composite of two scales assessing emotional problems and anxiety in the children. The two scales for the 2005, 2006 and 2008 rounds of the QLSCD are based on teachers' responses to the SAQT. Teachers were asked to base their responses on the six months preceding the survey. The scales upon which the composite scale is based are described below. For more details on the sources of these scales, the reader can refer to technical documents (in French only) available on the QLSCD website at http://www.iamillbe.stat.gouv.qc.ca/doc_tech_an.htm.

Emotional problems

To assess emotional problems, the teacher was asked how often during the past six months the child: "1) seemed to be unhappy or sad; 2) was not as happy as other children; 3) has no energy, was feeling tired; 4) had trouble enjoying him/herself; 5) is unable of making decisions." The response choices were: "1) Never or not true; 2) Sometimes or somewhat true; 3) Often or very true." Based on responses to these questions, scores were calculated on a scale ranging from 0 to 10. The Cronbach alphas were around 0.77 (children 7, 8 and 10 years of age).

Anxiety

To assess anxiety, the teacher was asked how often during the past six months the child: "1) was too fearful or anxious; 2) was worried; 3) cried a lot; 4) was nervous, high-strung or tense." The response choices were the following: "1) Never or not true; 2) Sometimes or somewhat true; 3) Often or very true." Based on responses to these questions, scores were calculated on a scale ranging from 0 to 10. Cronbach alphas were around 0.78 (children 7, 8 and 10 years of age).

For each survey round analyzed, a composite scale of internalizing behaviours was calculated from the averages of the scores obtained on the two aforementioned scales. The composite scale for each round under study presented a satisfactory level of internal consistency (Cronbach alphas ranging from 0.74 to 0.78 according to the survey round).

Overall academic performance as assessed by the teacher (children 7, 8 and 10 years of age)

Beginning in Grade 1, in the *Self-Administered Questionnaire for the Teacher* (SAQT), the teachers were asked to assess the overall academic performance of the child and his/her performance in four areas – mathematics, reading, writing and science.^a In this fascicle, only the overall performance was used in the analyses. The 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." The last two categories were grouped together because of small numbers.

Arithmetic test (at 10 years of age)

The arithmetic test covered three mathematical tasks – addition, subtraction and multiplication. It evaluated the child's ability to conduct these calculations using whole numbers. The abridged version of the CAT/2 used in our survey was developed for Statistics Canada's *National Longitudinal Survey of Children and Youth* (NLSCY) by the Canadian Test Center and adapted by G. Dionne at Laval University. In the QLSCD, the interviewer sat beside the child and read out loud each arithmetic task to accomplish. The child had to put a check mark beside the answer he/she chose on an answer sheet. The child could use a note sheet for calculations if needed. There was a maximum time allotted for each item. If three consecutive errors were made, the test was stopped for that particular type of arithmetic task. The child's final score comprised the total of correct items on the test.

Receptive vocabulary (at 10 years of age)

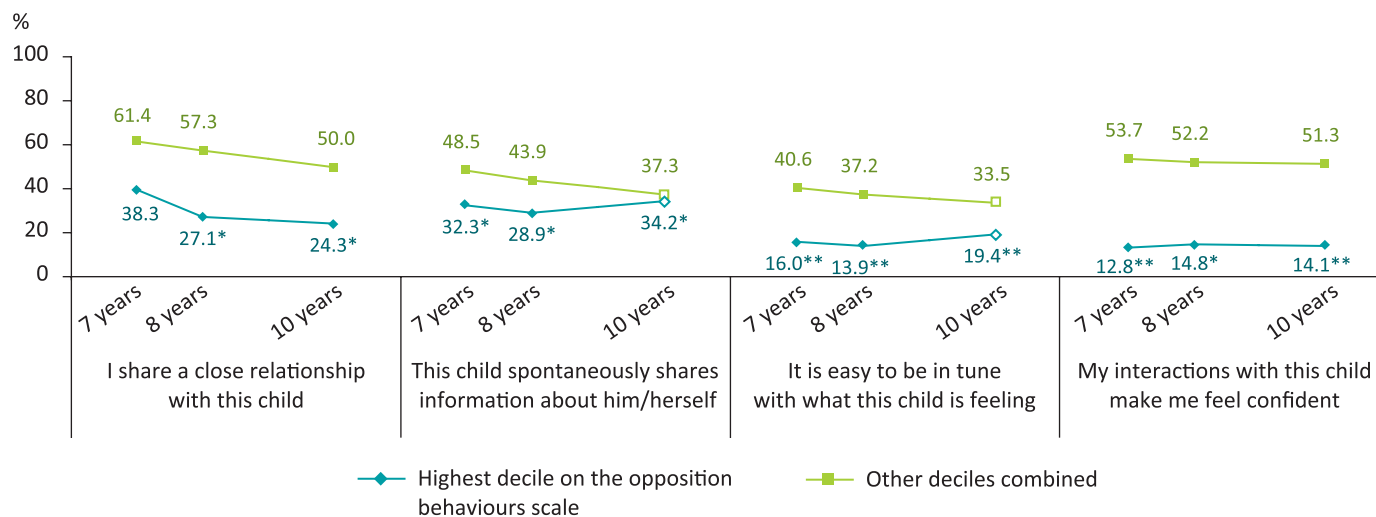
The *Peabody Picture Vocabulary Test* (PPVT) (Dunn, Thériault-Whalen and Dunn, 1993), administered one-on-one in either French or English, measured vocabulary understood by the child. This 15-minute word comprehension test may be administered from age 3 on. One of the attractive features of the PPVT is that it does not depend on oral or written responses. It is thus especially appropriate for assessing people who might have difficulty expressing themselves verbally, such as children with language disorders (Dunn and Dunn, 1981). The test was administered individually using a flipbook. During the test, the interviewer says a word and shows the child a page with four illustrations on it. The child must then point to the illustration matching the word said by the interviewer. The full series includes a set of practice illustrations followed by 170 arranged in increasing order of difficulty. The starting point is determined by the child's age. The PPVT has about a 70% correlation with IQ, using the Wechsler Intelligence Scale for Children (Dunn and Dunn, 1997).

a. This was assessed only when the children were 10 years of age, namely near the end of Grade 4.

APPENDIX B

Figure B.1

Proportion of teachers who responded favourably¹ to statements describing a positive teacher-student relationship, by decile on the opposition behaviours scale, Québec, 2005, 2006 and 2008



Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

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

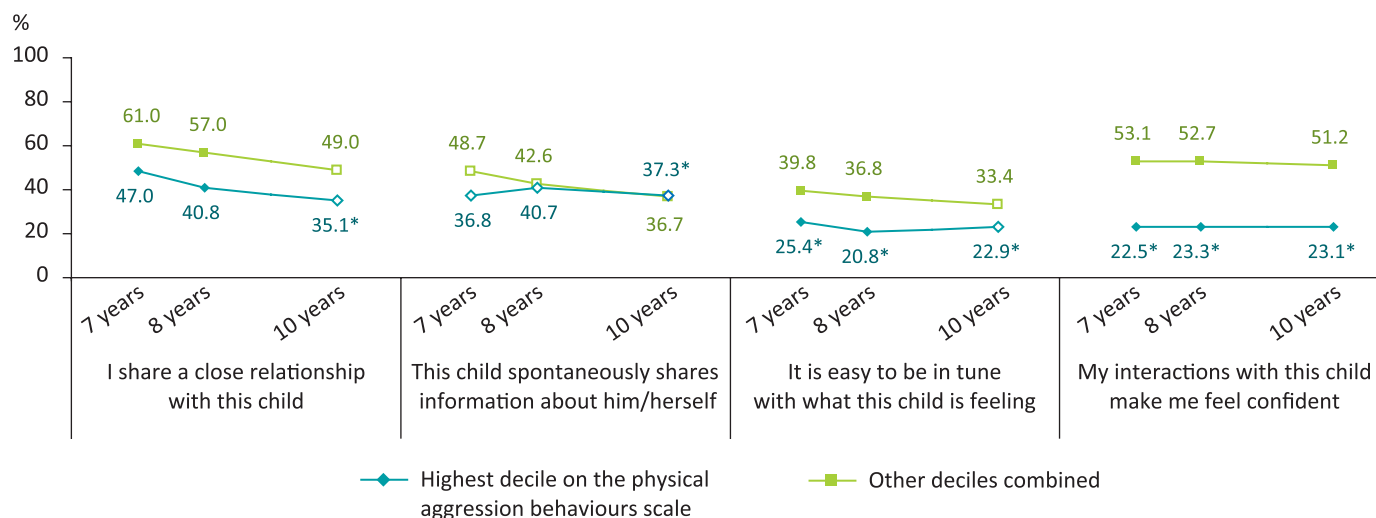
** Coefficient of variation higher than 25%; imprecise estimate provided for information purposes only.

1. Namely "Definitely applies".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure B.2

Proportion of teachers who responded favourably¹ to statements describing a positive teacher-student relationship, by decile on the physical aggression behaviours scale, Québec, 2005, 2006 and 2008



Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

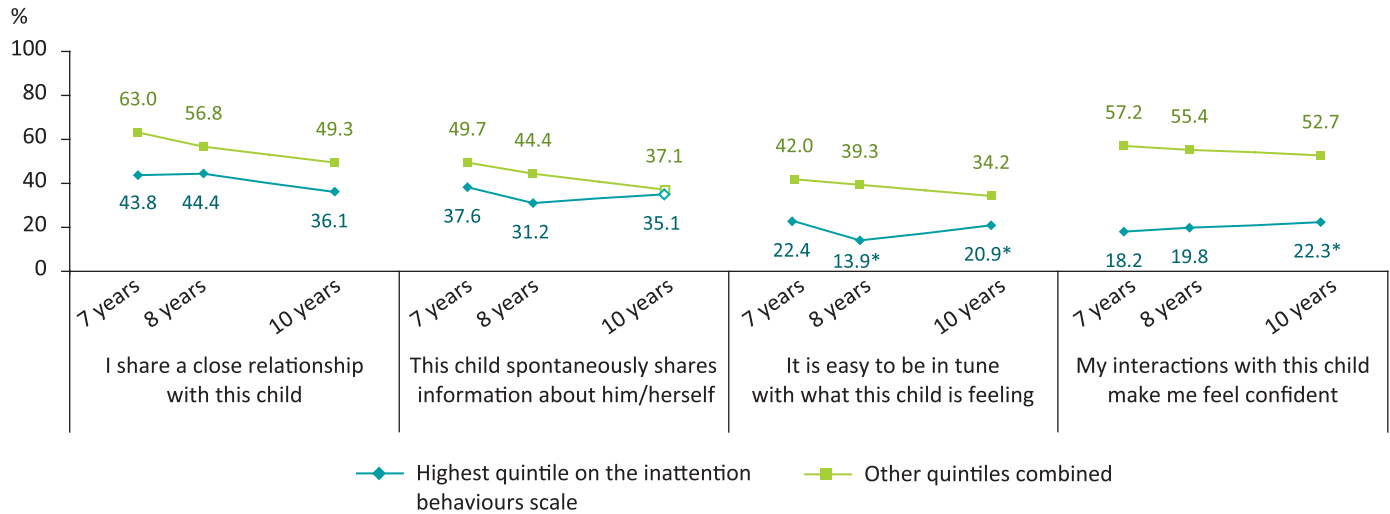
* Coefficient of variation between 15% and 25%; interpret with caution.

1. Namely "Definitely applies".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure B.3

Proportion of teachers who responded favourably¹ to statements describing a positive teacher-student relationship, by quintile on the inattention behaviours scale, Québec, 2005, 2006 and 2008



Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

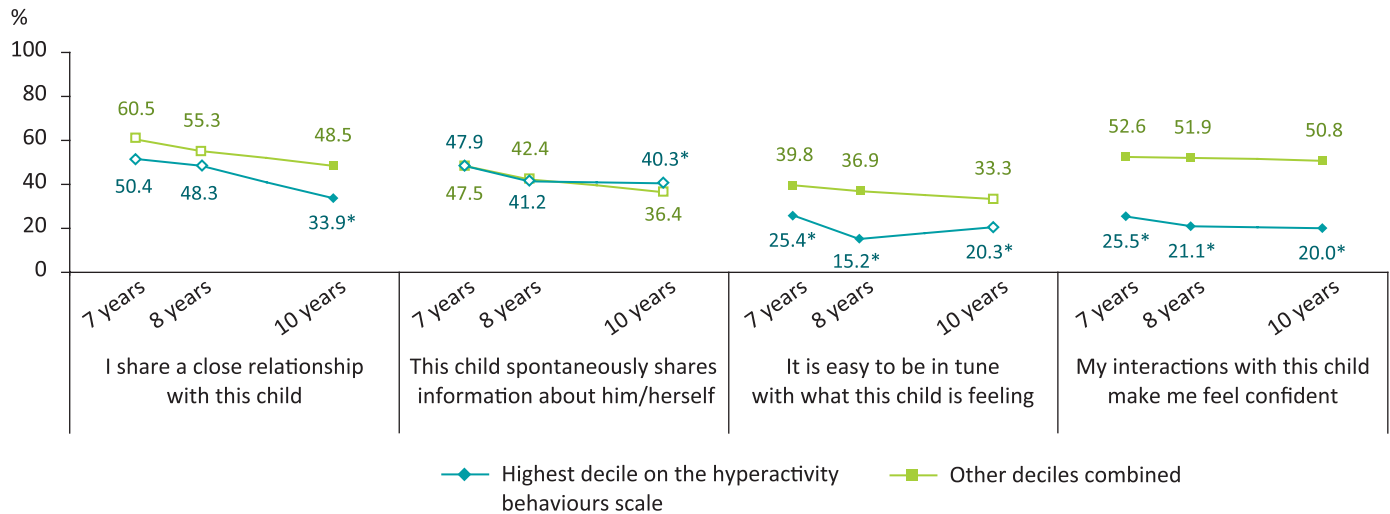
* Coefficient of variation between 15% and 25%; interpret with caution.

1. Namely "Definitely applies".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure B.4

Proportion of teachers who responded favourably¹ to statements describing a positive teacher-student relationship, by decile on the hyperactivity behaviours scale, Québec, 2005, 2006 and 2008



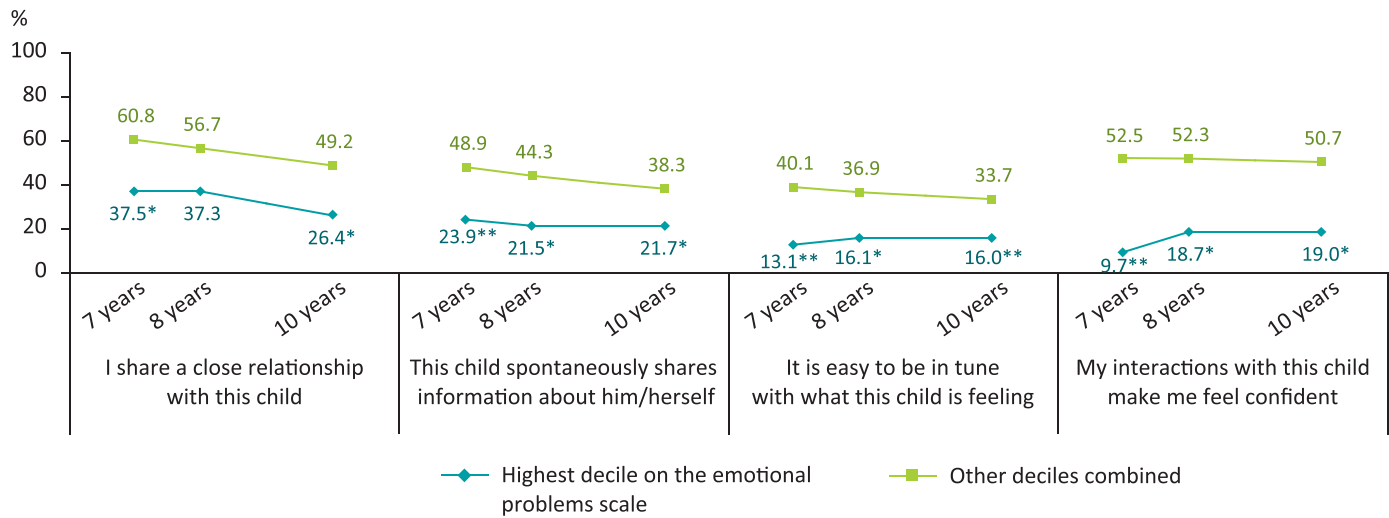
Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

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

1. Namely "Definitely applies".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure B.5
Proportion of teachers who responded favourably¹ to statements describing a positive teacher-student relationship, by decile on the emotional problems scale, Québec, 2005, 2006 and 2008



Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

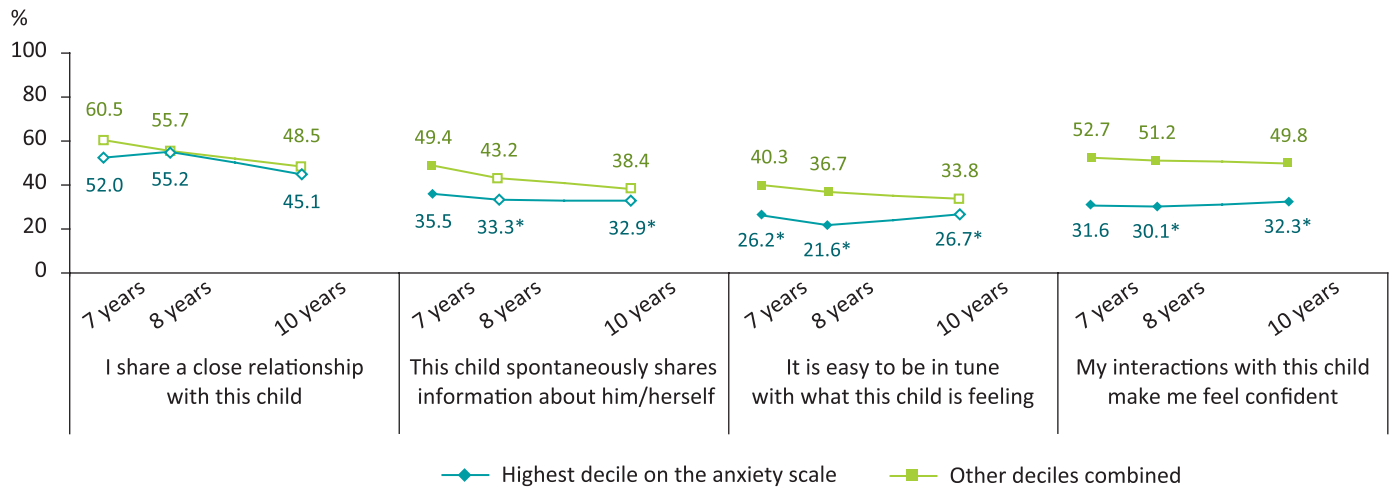
* Coefficient of variation between 15% and 25%; interpret with caution.

** Coefficient of variation higher than 25%; imprecise estimate provided for information purposes only.

1. Namely "Definitely applies".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure B.6
Proportion of teachers who responded favourably¹ to statements describing a positive teacher-student relationship, by decile on the anxiety scale, Québec, 2005, 2006 and 2008



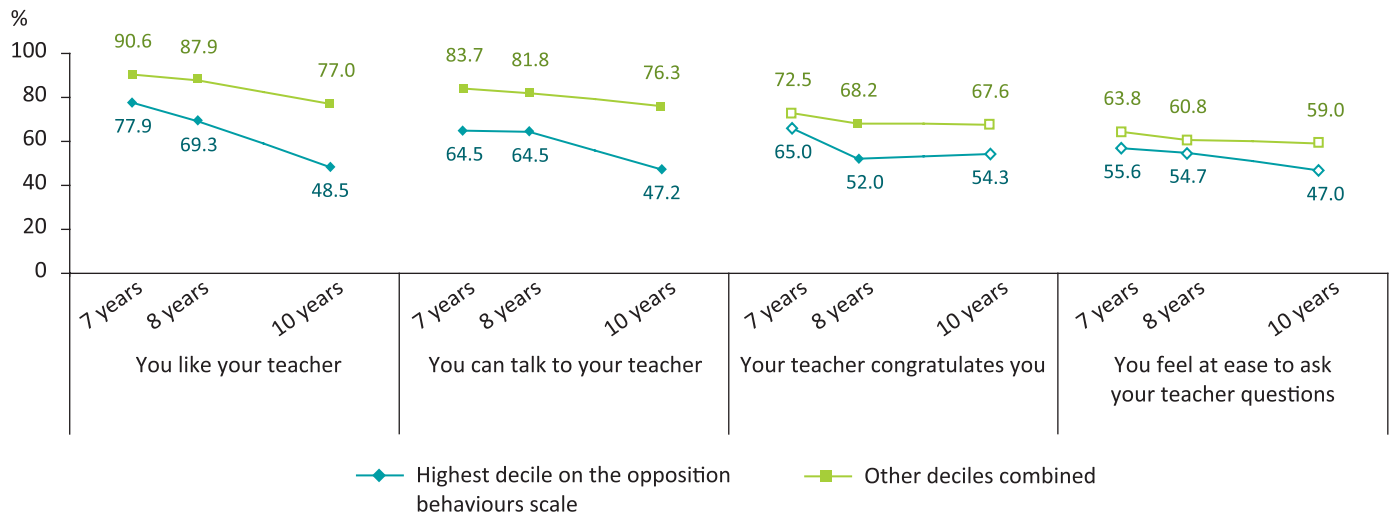
Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

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

1. Namely "Definitely applies".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure B.7
Proportion of children who responded favourably¹ to statements describing a positive teacher-student relationship, by decile on the opposition behaviours scale, Québec, 2005, 2006 and 2008

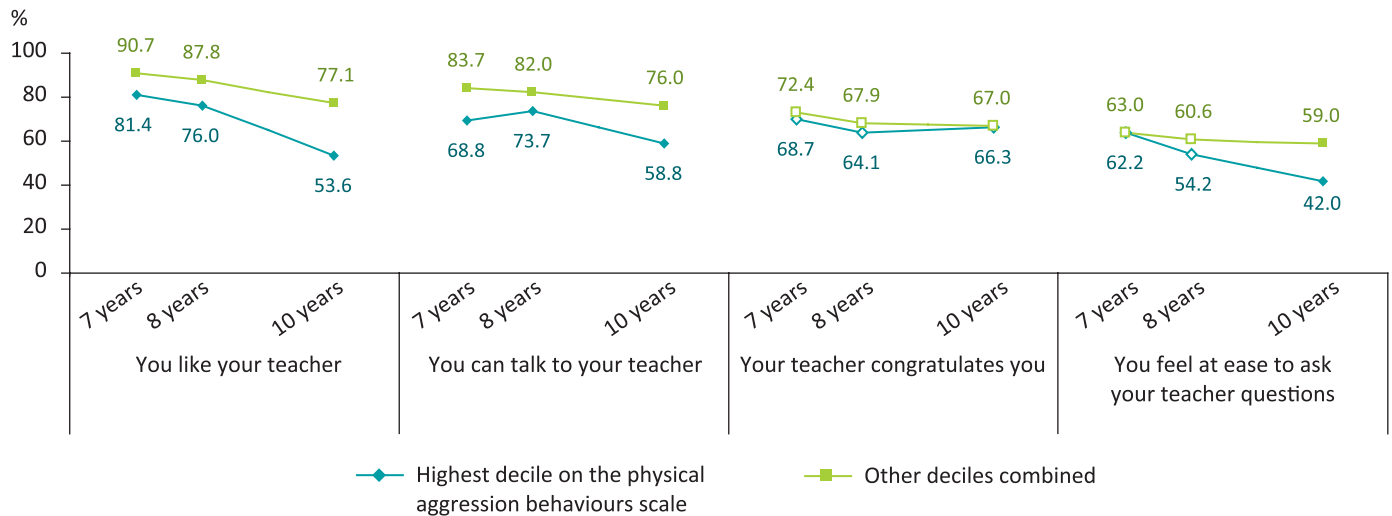


Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

1. Namely "Often or very true".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure B.8
Proportion of children who responded favourably¹ to statements describing a positive teacher-student relationship, by decile on the physical aggression behaviours scale, Québec, 2005, 2006 and 2008

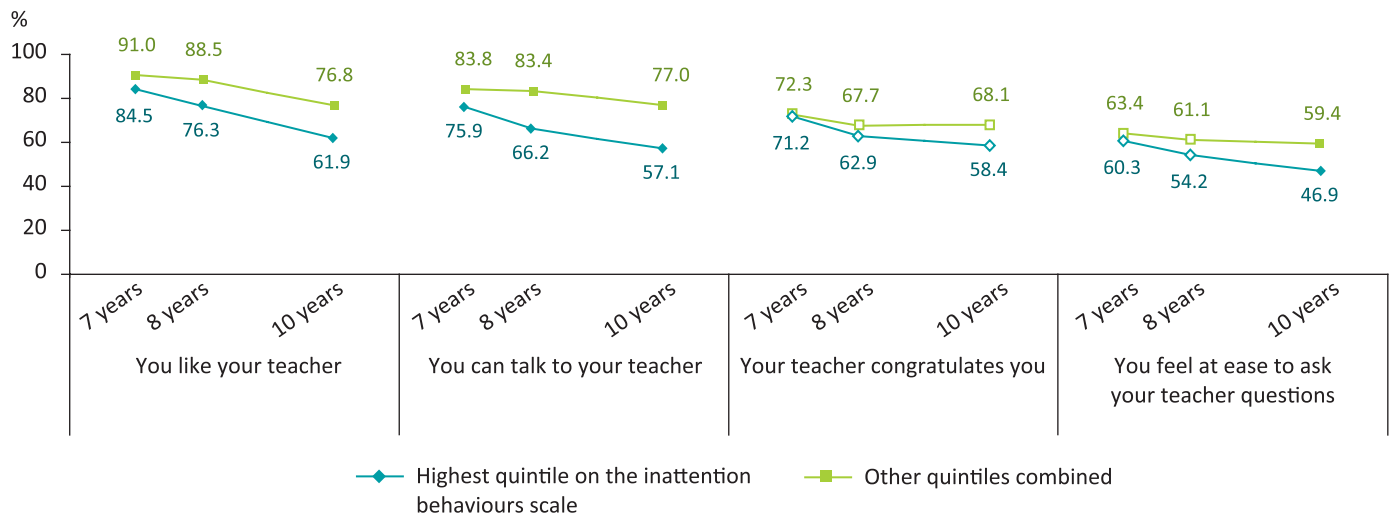


Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

1. Namely "Often or very true".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure B.9
Proportion of children who responded favourably¹ to statements describing a positive teacher-student relationship, by quintile on the inattention behaviours scale, Québec, 2005, 2006 and 2008

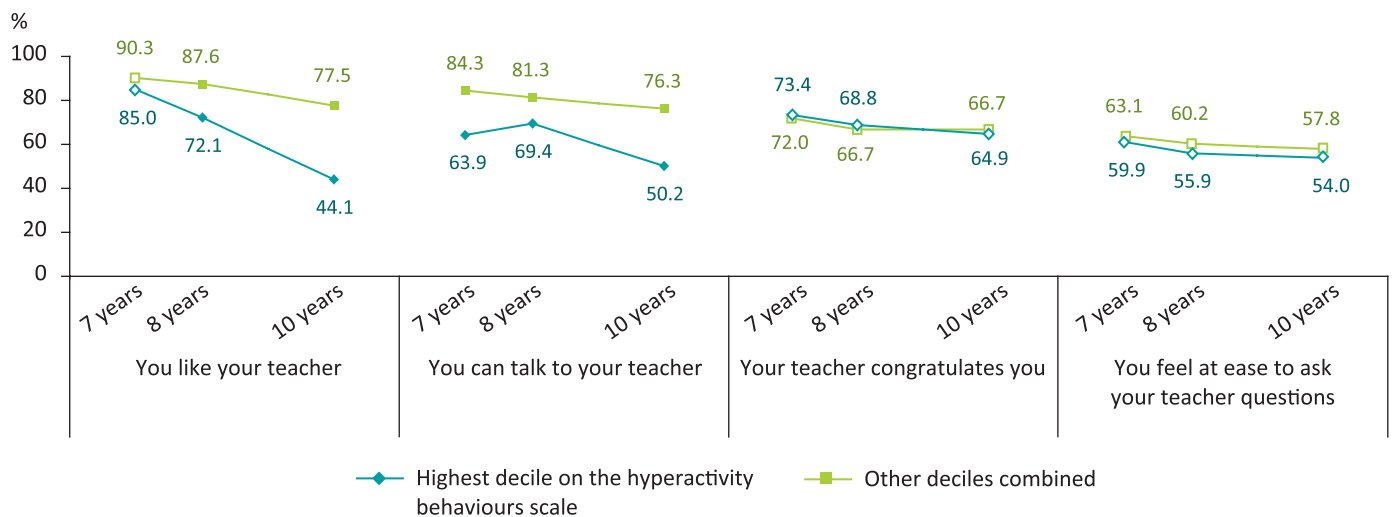


Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

1. Namely "Often or very true".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure B.10
Proportion of children who responded favourably¹ to statements describing a positive teacher-student relationship, by decile on the hyperactivity behaviours scale, Québec, 2005, 2006 and 2008

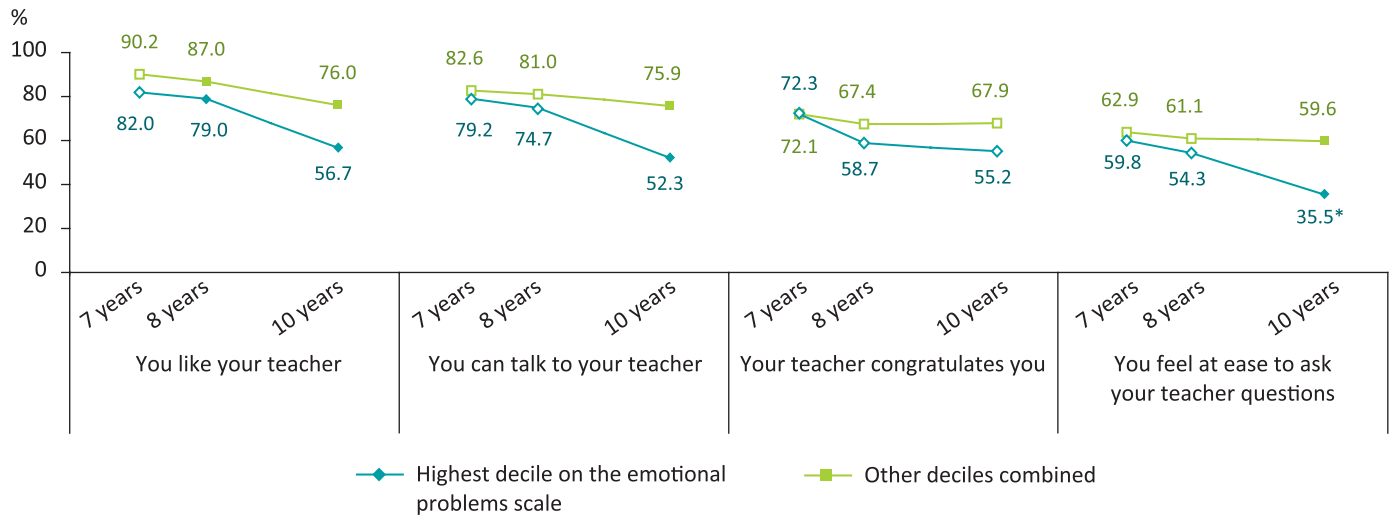


Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

1. Namely "Often or very true".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure B.11
Proportion of children who responded favourably¹ to statements describing a positive teacher-student relationship, by decile on the emotional problems scale, Québec, 2005, 2006 and 2008



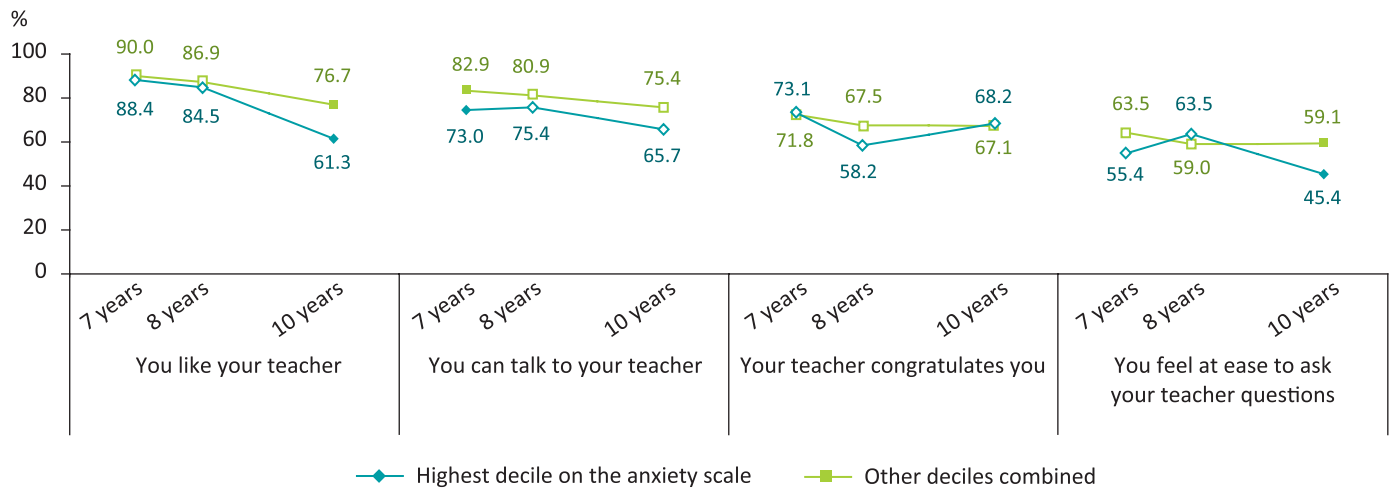
Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

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

1. Namely "Often or very true".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Figure B.12
Proportion of children who responded favourably¹ to statements describing a positive teacher-student relationship, by decile on the anxiety scale, Québec, 2005, 2006 and 2008



Diamonds or squares completely filled in with colour indicate that the difference between the two groups was significant in the chi-square test at the threshold of 0.05.

1. Namely "Often or very true".

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Table B.1
Distribution of teachers by their responses to statements describing a positive teacher-student relationship and their assessment of the child's overall academic performance at 7 years of age, Québec, 2005

	7 years							
	Near the top of the class		Above the middle of the class		In the middle of the class		Below the middle of the class/Near the bottom of the class	
	%	Confidence interval (95%)	%	Confidence interval (95%)	%	Confidence interval (95%)	%	Confidence interval (95%)
I share a close relationship with this child	p = 0.000							
Does not apply / Neutral, not sure	4.4**	2.2 ; 7.7	7.7**	4.2 ; 12.8	11.9	8.8 ; 15.7	14.7*	10.0 ; 20.5
Applies somewhat	22.6	17.6 ; 27.5	28.7	22.8 ; 34.7	35.2	30.3 ; 40.2	37.0	30.4 ; 43.5
Definitely applies	73.1	67.8 ; 78.3	63.6	56.9 ; 70.2	52.8	47.7 ; 58.0	48.3	41.6 ; 55.1
This child spontaneously shares information about him/herself	p = 0.000							
Does not apply / Neutral, not sure	12.0*	8.2 ; 16.6	10.7*	7.0 ; 15.3	22.5	17.9 ; 27.1	27.0	20.8 ; 33.9
Applies somewhat	31.9	26.7 ; 37.0	35.1	28.8 ; 41.4	32.7	27.8 ; 37.6	39.8	32.6 ; 46.9
Definitely applies	56.2	50.8 ; 61.5	54.3	47.5 ; 61.0	44.8	39.7 ; 49.8	33.2	26.8 ; 39.7
It is easy to be in tune with what this child is feeling	p = 0.000							
Does not apply / Neutral, not sure	14.6	10.8 ; 19.2	19.6	14.3 ; 25.7	29.3	24.2 ; 34.3	48.8	42.1 ; 55.4
Applies somewhat	31.9	26.6 ; 37.1	33.9	28.0 ; 39.7	36.4	31.2 ; 41.7	34.3	28.0 ; 40.6
Definitely applies	53.5	48.1 ; 59.0	46.6	39.9 ; 53.2	34.3	29.5 ; 39.1	16.9	12.4 ; 22.2
My interactions with this child make me feel confident	p = 0.000							
Does not apply / Neutral, not sure	8.8*	6.0 ; 12.4	14.4*	10.0 ; 19.8	26.5	21.8 ; 31.3	36.6	30.0 ; 43.3
Applies somewhat	21.9	17.5 ; 26.2	24.0	18.3 ; 29.6	30.5	25.6 ; 35.3	39.0	32.1 ; 45.9
Definitely applies	69.3	64.3 ; 74.2	61.7	55.0 ; 68.3	43.0	38.2 ; 47.8	24.3	18.6 ; 30.1

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

** Coefficient of variation higher than 25%; imprecise estimate provided for information purposes only.

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Table B.2
Distribution of teachers by their responses to statements describing a positive teacher-student relationship and their assessment of the child's overall academic performance at 8 years of age, Québec, 2006

	8 years							
	Near the top of the class		Above the middle of the class		In the middle of the class		Below the middle of the class/Near the bottom of the class	
	%	Confidence interval (95%)	%	Confidence interval (95%)	%	Confidence interval (95%)	%	Confidence interval (95%)
I share a close relationship with this child	p = 0.000							
Does not apply / Neutral, not sure	4.7*	2.7 ; 7.6	7.5**	4.2 ; 12.1	16.1	12.2 ; 20.5	20.5*	14.7 ; 27.4
Applies somewhat	31.5	26.0 ; 37.1	27.0	21.0 ; 33.0	34.0	29.0 ; 39.0	35.1	29.0 ; 41.1
Definitely applies	63.7	58.1 ; 69.4	65.5	59.1 ; 71.9	50.0	44.8 ; 55.2	44.4	37.9 ; 50.8
This child spontaneously shares information about him/herself	p = 0.000							
Does not apply / Neutral, not sure	13.9	10.5 ; 17.9	13.6*	9.4 ; 18.6	20.4	16.1 ; 24.7	29.4	23.4 ; 35.4
Applies somewhat	34.2	28.4 ; 39.9	38.7	32.3 ; 45.0	40.6	35.4 ; 45.8	39.9	33.3 ; 46.6
Definitely applies	51.9	45.9 ; 57.9	47.8	41.4 ; 54.2	39.0	34.0 ; 44.0	30.6	24.6 ; 36.7
It is easy to be in tune with what this child is feeling	p = 0.000							
Does not apply / Neutral, not sure	24.8	19.7 ; 30.0	18.5	13.7 ; 24.1	33.6	28.5 ; 38.7	44.7	38.0 ; 51.5
Applies somewhat	30.0	24.8 ; 35.2	36.0	29.4 ; 42.6	33.8	29.0 ; 38.7	36.8	30.3 ; 43.3
Definitely applies	45.1	39.3 ; 50.9	45.5	38.8 ; 52.3	32.6	27.6 ; 37.6	18.4	13.7 ; 24.0
My interactions with this child make me feel confident	p = 0.000							
Does not apply / Neutral, not sure	8.6*	6.0 ; 11.9	14.1*	9.9 ; 19.3	29.2	24.3 ; 34.0	40.2	33.8 ; 46.5
Applies somewhat	20.7	15.8 ; 25.5	23.9	18.1 ; 29.6	29.5	24.7 ; 34.2	33.8	33.9 ; 39.7
Definitely applies	70.7	65.6 ; 75.8	62.0	55.2 ; 68.8	41.3	36.2 ; 46.4	26.1	33.1 ; 31.4

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

** Coefficient of variation higher than 25%; imprecise estimate provided for information purposes only.

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Table B.3
Distribution of teachers by their responses to statements describing a positive teacher-student relationship and their assessment of the child's overall academic performance at 10 years of age, Québec, 2008

	10 years							
	Near the top of the class		Above the middle of the class		In the middle of the class		Below the middle of the class/Near the bottom of the class	
	%	Confidence interval (95%)	%	Confidence interval (95%)	%	Confidence interval (95%)	%	Confidence interval (95%)
I share a close relationship with this child	<i>p</i> = 0.002							
Does not apply / Neutral, not sure	8.5**	4.8 ; 13.8	13.1*	7.8 ; 20.1	16.5*	11.7 ; 22.4	18.9*	12.8 ; 26.3
Applies somewhat	29.2	22.4 ; 36.8	37.6	30.7 ; 44.5	40.1	33.9 ; 46.3	43.7	35.7 ; 51.7
Definitely applies	62.3	55.0 ; 69.5	49.3	42.0 ; 56.6	43.4	37.0 ; 49.7	37.4	29.9 ; 44.9
This child spontaneously shares information about him/herself	<i>p</i> = 0.016							
Does not apply / Neutral, not sure	18.4*	12.9 ; 24.9	23.2	17.3 ; 30.1	29.6	23.8 ; 35.3	32.7	25.1 ; 40.3
Applies somewhat	42.1	34.8 ; 49.4	31.8	24.6 ; 38.9	37.8	31.6 ; 44.0	36.3	28.8 ; 43.7
Definitely applies	39.6	32.0 ; 47.1	45.0	37.2 ; 52.7	32.6	31.7 ; 38.4	31.0	23.5 ; 38.5
It is easy to be in tune with what this child is feeling	<i>p</i> = 0.000							
Does not apply / Neutral, not sure	19.2*	13.7 ; 25.7	26.5	19.8 ; 34.0	35.7	29.8 ; 41.7	44.4	36.7 ; 52.2
Applies somewhat	41.7	34.1 ; 49.4	33.4	26.6 ; 40.2	34.6	28.5 ; 40.6	35.4	27.8 ; 43.0
Definitely applies	39.1	31.6 ; 46.5	40.1	32.6 ; 47.7	29.7	24.2 ; 35.2	20.1	14.6 ; 26.7
My interactions with this child make me feel confident	<i>p</i> = 0.000							
Does not apply / Neutral, not sure	12.3*	7.8 ; 18.1	19.5*	13.3 ; 27.0	27.4	21.6 ; 33.2	36.8	28.9 ; 44.6
Applies somewhat	13.4*	9.0 ; 18.9	26.8	20.5 ; 34.0	30.3	24.6 ; 36.1	38.2	30.6 ; 45.8
Definitely applies	74.3	67.6 ; 80.3	53.7	46.2 ; 61.2	42.2	36.4 ; 48.0	25.0	18.6 ; 32.4

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

** Coefficient of variation higher than 25%; imprecise estimate provided for information purposes only.

Source: Institut de la statistique du Québec, QLSCD 1998-2010.

Notes

1. H el ene Desrosiers is Coordinator of the *Programme d'analyse et de valorisation des donn ees longitudinales* (Analyses and Promotion of Longitudinal Data) in the *Direction des enqu etes longitudinales et sociales* (Department of Longitudinal and Social Surveys) in the ISQ. Karine T etrault is a Research Officer in this department. Christa Japel and Pooja R. P. Singh are Professor and Postdoctoral Fellow respectively in the *D epartement d' ducation et formation sp ecialis ees* (Department of Education and Specialized Training) at the Universit e du Qu ebec  a Montr eal (UQAM).
2. Note that no data collection was conducted when the children were in Grade 3 and a median age of 9 years. Although aspects of conflict in the teacher-student relationship were also examined in the QLSCD, they are not covered here.
3. These were the median ages of the children at each round of data collection. The fact that data collection occurred at the end of the school year explains why the median ages of the children were 6, 7, 8 and 10 years of age in kindergarten, Grade 1, Grade 2 and Grade 4 respectively.
4. Around 3% of the children in kindergarten and Grade 2 were not in the same grade level as the general cohort, and 9% were in this situation in Grade 4. Some children were in a higher grade level and others were in a lower one. In this fascicle, the analyses presented were conducted on the basis of the children's ages. Therefore when comparisons are made among grade levels, they include a proportion of children that were not in the same grade level as the other children.
5. Source: Institut de la statistique du Qu ebec, data extracted from the *Fichier d'inscription des personnes assur ees* (Register of Insured Persons) of the R egie de l'assurance maladie du Qu ebec (Qu ebec Health Insurance Board – i.e. Medicare, which is universal in the province), 2004, 2005, 2006, 2008.
6. A child was considered to be living in a low-income household if the income before taxes for all members of the household was below the "low-income cutoff" set by Statistics Canada related to the size of the household, region in which it is located, and a given reference year (in this case the year preceding the survey).
7. With the goal of identifying the children with the most behavioural problems, it was decided to set a cutoff point in the highest decile if possible. However, for behaviours or phenomena in which few children were found in the "problem" decile, this threshold was softened, and the highest quintile was used for this group. Note that in an individual scale, a score at the threshold can vary with the age of the child. The distribution of data can present variations given that certain behaviours become more or less frequent as the children age.
8. Since the majority of teachers in kindergarten and elementary school were women, we have used the feminine pronoun "her" instead of "him/her" to facilitate ease of reading.
9. The Cronbach alphas for the set of children's items at 7 and 8 years of age were 0.46 and 0.52, so under the acceptable threshold.
10. This means the percentage of teachers who responded "Definitely does not apply," "Not really" or "Neutral, not sure" to the statement "My interactions with this child make me feel effective and confident."
11. At the time of the writing of this fascicle, we did not have the weights needed to generate longitudinal estimates based on the teachers' responses in all the rounds under study – kindergarten, Grades 1, 2 and 4.
12. In Qu ebec, the "first cycle" (also known as "Cycle 1") of elementary school refers to Grades 1 and 2 and the "second cycle" refers to Grades 3 and 4.

13. When covering children's variables related to the teachers' assessments, only differences related to "Definitely applies" are addressed and shown to facilitate ease of reading.
14. With regards to items assessed by the teachers, we compared children for whom teachers responded "Definitely applies" with the rest of the children. With regards to items assessed by the children, we compared those who responded "Often or very true" with those who responded either "Never or not true" or "Sometimes or somewhat true" to each statement.
15. We would like to remind the reader that the scales were constructed in dichotomous fashion (highest decile or quintile vs. all other deciles or quintiles combined). No problem of multicollinearity was detected.

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