The effect of the relationship of some variables to mathematics teachers and its relationship to teaching

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Abstract---In order to properly situate the problem in its context, attention will first be drawn to a definition of motivation and its impact on student success. Second, we will follow up on the impact that living in a disadvantaged environment can have on student motivation. Finally, the relationship between the teacher and the student will be put forward so as to understand the importance it can take as a protective factor in a school career. This first chapter will end with the formulation of the general objective.

Type of Paper--- Review

Keywords: variables to mathematics , teachers and its relationship

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Introduction:

Several characteristics can be considered as obstacles to adaptation to school. A student's experience can be tinged with difficulties on a personal level (low self-esteem, hyperactivity), school (difficult relationships with others, lack of motivation) and family (poverty, low income, neglect) (Janosz, 2000; Lessard et al., 2007; Moss, 2005; Puentes-Neuman and Cartier, 2007; Tessier and Schmidt, 2007). It is therefore likely that young people facing some of these conditions do not have as many positive bases on which to continue their education. Among the factors being negatively associated with academic success and having a strong link with dropping out, we find coming from a disadvantaged background (Brais, 1998; McLoyd, 1998; Pisa, 2003; Puentes-Neuman, Trudel and Breton, 2007). Indeed, poverty is accompanied by inequalities in the social context of the child such as the lack of social, educational and material resources which directly influence the child at the cognitive, emotional, behavioral and social levels (McLoyd, 1998; PISA, 2003; Weinstein, 2002).

The goal of any school educator is to bring as many students as possible to success. On the other hand, academic success can be interpreted in different ways and its definition evolves regularly. For our part, we favor a definition of success in three parts: a person succeeds

When she learns, when she achieves her personal goals or when she develops her skills in terms of education, socialization and qualification (Archambault and Chouinard, 2009). However, regardless of the definition chosen, it is unanimous that success is partly responsible for persistence in school, which is essential for acquiring a diploma. In turn, having a diploma is an essential element in the fight against poverty. It has also been proven that young people who leave school without having obtained a form of diploma are more affected by unemployment, have a lower average salary and constitute the majority of social assistance recipients and the prison population (Group of action on perseverance and academic success, 2009). Academic success is therefore a major concern in the current school context. Quebec is no exception to this concern. Indeed, according to the report of the Action Group on Persistence and Academic Success (2009), one pupil on three on average would not have a secondary diploma at the age of 2000.

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School motivation and success:

The various school agents set themselves the objective of providing students with quality education in a climate conducive to learning. On the other hand, even if these objectives are achieved, a high level of learning will also require a high level of motivation (Hudley, Daoud, Hershberg, Wright-Castro and Polanco, 2002). In the broad sense, motivation can be defined as the state that pushes a person to plan to engage in effective behaviors to perform a task (Deci, Vallerand, Pelletier and Ryan, 1991). Unfortunately, research shows that the more students progress in their education, the lower the motivation becomes. However, the majority of students begin their schooling with a high level of motivation for their academic success and it is during their course that they risk seeing their interest decrease and thus no longer want to learn as much (Karsenti, 2003)

In order to prepare students for the many challenges they will face in the job market, the school has been given the triple mission of educating, qualifying and socializing. But to be able to benefit as much as possible from what the school has to offer, the student must be willing to make efforts and take an active place in their learning (Fredricks, Blumenfeld and Paris, 2004). Furthermore, the commitment, responsible for the student's efforts in carrying out a specific task, will only be visible when there is motivation (Newmann, Whelage and Lamborn, 1992). Commitment to tasks is one of the desirable results from the presence of academic motivation in a student (Archambault and Chouinard, 2009). Motivation for achievement is therefore one of the main success factors. It manifests itself as being the perseverance and quality of student involvement in learning activities (Chouinard, Plouffe and Roy, 2004; Hudley, Daoud, Hershberg, Wright-Castro and Polanco, 2002).

School motivation and disadvantaged backgrounds:

Academic motivation is responsible for the presence of commitment in tasks among students (Archambault and Chouinard, 2009). A poorly motivated student may therefore find themselves plunged into a process of school disengagement which is responsible for early school dropout (Newmann, Wehlage and Lamborn, 1992). This phenomenon is worrying considering the harmful effects resulting from leaving the school system without a diploma (unemployment, lower average salary, social assistance, higher level of incarceration) (Task Force on Perseverance and Educational Success, 2009). This fact is particularly worrying in underprivileged areas where the graduation rate is considerably lower than the average (Brais, 1998). In fact, according to the MELS (2005), almost double the number of students from a disadvantaged background leave school without a diploma or qualification compared to those from a privileged background (11.1% against 5.5% for boys and 6.5% against 3.2% for girls). Family and school deprivation have been cited as the best predictors of dropping out of school for both boys and girls (Brais, 1998).

Positive relationships with teachers: a protective factor:

The feeling of belonging is a very powerful basis for human motivation (Newmann, Wehlage and Lamborn, 1992). From this perspective, positive relationships with peers would be very important and would foster this feeling of belonging to the school. Acceptance by peers would then bring some satisfaction with school and thereby increase motivation and commitment through the school effort put in place (Fredricks, Blumenfeld and Paris, 2004). On the other hand, the feeling of belonging would not only be achieved in connection with peers. Relationships with adults in the school would also be of great importance. Indeed, several factors influence motivation such as family, community, culture and educational context (Fredricks, Blumenfeld and Paris, 2004). This educational context is mainly dictated by two things: the teacher's attitudes and pedagogical practices. These will be the basis of the relationship that can be created between the teacher and his students (Archambault and Chouinard, 2009).

The development of a sense of belonging involves, among other things, feeling accepted. Among the dimensions of acceptance, the student's perception of the support of his teacher is in particular responsible for higher motivation (Goodenow, 1992). The child develops in relation to several social agents who each play an important role. Besides the Conseil Supérieur de l'Enseignement (2001) specifies the importance of these different relationships within the framework of the school reform which aims to reinforce the feeling of belonging and counter school dropout.

In summary, the teacher-student relationship is a very important aspect for students. It is associated with several positive results in academic adjustment. A positive relationship with the teacher is of paramount importance for the success and in particular for the motivation of students from disadvantaged socioeconomic backgrounds (Green et al., 2008; Chouinard et al., 2007; McGlynn, 2006; Fallu and Janosz, 2003). This project will therefore be based on an external determinant of academic motivation, i.e. the student's perception of his teacher-student relationship, as well as on the

internal determinants acting on academic motivation, i.e., the perceptions, goals and needs of students, all while checking the moderating effect of the participants' gender.

Conceptual framework and literature review:

Many students face certain characteristics that may affect their adjustment to school. Also, school and family life is often full of pitfalls and does not always provide a positive basis on which to rely for further studies. Among these pupils, those in the third cycle of primary school also find themselves faced with the prospect of entering secondary school. This stage, linked to changes in the educational context, is also accompanied by the onset of adolescence and its physical, psychological and social transformations. It therefore becomes essential for education workers to consider the factors that can positively influence the educational path of these students.

Being part of a socio-cognitive approach, our research takes into account that the internal factors determining motivation are also influenced by the environment in which the child evolves. Academic motivation therefore becomes a dynamic process which brings about changes in the personal characteristics of the pupil which, in turn, determines their behavior and attitudes towards school. On the other hand, the environment, personal characteristics and behaviors of the pupil in turn influence motivation (Viau, 1997). From this perspective, it is therefore possible for education workers, by modifying certain characteristics of the environment, to have an impact on the student's academic motivation.

Motivation to Learn and the Value-Expectations Model:

Considering the nature of the commitment, to be able to encourage its presence, you must first act to increase motivation. It then becomes important to determine which factors influence the degree and maintenance of motivation. Certain internal characteristics of the student were raised as being the elements influencing the level of motivation. Among other things, the feeling of competence in relation to the work requested, the interest and the utility value attached to the task as well as the type of goals pursued by the student in the accomplishment of the tasks stood out as being elements allowing to predict the presence of academic motivation (Chouinard et al., 2007; Fredericks and Eccles, 2002; Miller, Greene, Montalvo, Ravindran and Nichols, 1996; Shunk and Pajares, 2002).

Feeling of competence:

We will focus first on the feeling of competence. This component is based on the belief that human development takes place in interaction with a person's personal factors and the actions they take in a given context (Shunk and Pajares, 2002). It represents a person's perceptions of things they can and cannot do. The feeling of competence is a good determinant of commitment to a task. In fact, in the Expectations-value framework, it is the central element of the Expectations variable which is defined as the assessment that a person makes of his possibilities of success based on his skills, his acquired knowledge and the context of realization (Shunk and Pajares, 2002; Viau, 1997).

Definition and relevance:

The feeling of competence allows, when a person is put in a new situation, to answer the question "Am I able to do this activity?" ". Indeed, the feeling of competence is defined as the conviction that a person has of his capacity to carry out a task (Bandura, 1977). Students with a high sense of competence show greater motivation by the fact that they are more likely to engage in tasks by participating, putting in a lot of effort, and persisting in difficulties, which leads them to obtain better results (Shunk and Pajares, 2002). In fact, before engaging in a new activity, the student goes through a process of self-assessment of his abilities which will influence his desire to invest in this task. For example, a student who does not perceive that he has the skills to succeed in a certain activity may be tempted not to try for fear of failing. In return, the more competent the student feels about a task, the more effort he will put into it. Moreover, when studying the factors influencing the motivation to engage in a task, the most robust predictor was the students' perception of their academic skills (Hudley et al., 2002). This makes sense when considering that the feeling of competence in the face of a task influences the persistence which the person will display, which is in turn a manifestation of commitment to this task (Miller, Greene, Montalvo, Ravindran and Nichols, 1996).

Interest and utility value accorded to the task:

The second internal determinants of academic motivation that we have chosen to study are the interest and the utility value accorded to the task. Value is considered to be the student's perception that what he is learning is relevant,

interesting and will eventually be useful to him (Chouinard et al., 2007). Some authors differentiate two variables associated with the value of an object (Renninger and Hidi, 2002). The first is related to the feelings that the object brings, such as pleasure, stimulation and commitment, which are the typical feelings of interest in something. Then there is the value utility of the object that arises when something is given meaning and importance. The difference between the utility value and the interest lies in the fact that the interest is based only on the activity itself and not on the effects that it can have in the short or long term.

Definition and relevance:

In the Eccles and colleagues (1983) Expectations-Value model, the value placed on the task is one of the main determinants that can guide the attitude of students when they have to complete a task. The value of the task can be defined as the student's belief that a task is worth doing or not (Darmanegara Liem, Lau & Nie, 2008). In general, people perform tasks that are considered to be of positive value and avoid those that they consider to be of negative value (Fredericks and Eccles, 2002).

Achievement goals:

In connection with the value component of the Expectations-value model, the achievement goals variable attempts to explain the meaning that students can give to the different experiences lived in a school context. Here, these are the reasons why the students decide to engage in the tasks that are put forward.

Definition and relevance:

Achievement goals, which refer to the general way in which learning is approached, have a great impact on students' motivation and performance by leading them to develop their own vision of what constitutes success or failure (Ames et Archer, 1988). These learning orientations have an impact on motivation and engagement by influencing cognitive processes which in turn affect the cognitive, affective and behavioral spheres of the student (Bowen, Chouinard and Janoz, 2004). The first goal leads to the accomplishment of the work for the improvement of his personal skills. In the literature, there are various names for these type goals such as task-oriented goals, learning goals or mastery goals. The second type of goal leads to the achievement of the work in order to demonstrate a high performance compared to others who do the same work. It has also received several names such as self-oriented goals, performance goals or skills-based goals (Bowen, Chouinard, Janosz, 2004). In the present work, we will speak of a goal of mastery and a goal of performance, considering that for several years the majority of authors have converged on these appellations. We will also discuss the goal of work avoidance.

The relationship with the teacher:

Several determinants external to the student can influence his or her school career, such as relationships with parents and peers. In the school context, the relationship with the teacher is of great importance. In this section, we will discuss the different approaches that can explain this relationship and particularly its nature in connection with the theory of attachment.

Definition and different approaches:

Having a significant presence in children's lives, the teacher is an adult who could be considered a personal mentor, like an adult friend who would provide support and help to students (Bernstein-Yamashiro, 2004). However, it is important to consider the fact that this relationship results from an interaction between two people. The definition of the interaction of Hargreaves (1975) allows this aspect to be taken into account.

Attachment theory:

By providing support in many forms, both psychological and physical, teachers would be important agents in the academic journey of students. In addition, the type of interaction between the teacher and the pupils is similar to that between the mother and her child. In fact, these two adults engage with the young person in a relationship characterized by benevolence and support (Lapointe and Legault, 2004). Before focusing on the teacher-student relationship in terms of attachment, it is important to remember the source of this theory. With the majority of research related to this perspective

having been done in relation to the mother, Bowlby was one of the first to recognize that it is possible for a child to maintain relationships based on attachment with other adults. He therefore put forward certain criteria that can determine if a relationship can be based on this concept: This brings us to consider the fact that a child could maintain relationships based on attachment with different adults around him. These relationships can vary in intensity according to the affinities between the people involved and according to the hierarchy of the relationship. On the adult side, attachment behaviors towards a child are expressed by responding to their needs, their requests and by looking after them (Bergin and Bergin, 2009). The most important hierarchical attachment relationship is that of parent and child. This would allow the child to create a representation of the concept of attachment and thus influence his ability to maintain future relationships.

Master-student relationship and deprivation:

The difficulties inherent in living in a poor environment lead children to be confronted with a certain number of stressors compared to those coming from better-off environments. The school with the human and material resources it has can, as reported by St-Jacques (2000) in Vie Pédagogique, serve as protection against adverse factors present in disadvantaged areas. It is by giving them cognitive and social tools to enable them to cope with life that the school will participate in the development of these children. In particular, it is through a positive relationship with the teacher that these tools can be transmitted optimally (McGlynn, 2006).

Teacher-student relationship and feeling of competence:

Several researchers have studied the attitudes of teachers in relation to academic motivation. Among others, Vallerand, Fortier and Guay (1997), in a study of high school students, highlighted the role support as a mediator of academic motivation. In fact, they highlighted that the social context in which learning takes place would have an impact on academic motivation through the feeling of competence. The perception of quality support from the teacher would positively influence the feeling of competence, which in turn would influence academic motivation (Chouinard, Karsenty and Roy, 2007).

In fact, following their study of students at the start of high school, Chouinard, Karsenty and Roy (2007) pointed out that young people who perceive support from their teacher report finding themselves more competent in mathematics. According to this research, it would seem that in adolescence, in the case of mathematics, teachers play as decisive a role as parents. At the level of social workers, the support of the teacher would be the best predictor of the perception of competence in this subject.

This study:

After carrying out this review of the literature, it is now possible to consider the relevance of this project and the angle of study that will be favored. The reasons to justify the implementation of the study, the choice of the various internal determinants related to academic motivation as well as the reasons justifying the choice of attachment theory to study the impact of the master- student will be explained.

On the scientific side, this study will clarify the impact of certain aspects of the teacher-student relationship on academic motivation by gender. A relationship with his teacher perceived positively by the student having been presented as responsible for increasing this motivation (Green et al., 2008; Wentzel, 1998).

Previous studies on the impact of the teacher-student relationship focus mainly on its influence on motivation in relation to performance (Bergeron, 2008). The individual influence of each aspect of this relationship (warmth, support, conflict), as a predictor of the determinants of academic motivation, has been the subject of fewer studies. The teacher-student relationship is a concept very present in the literature. In addition, the majority of research results do not come from studies with students from Quebec schools. What makes our study?

Assumption and objectives:

Certain research objectives can therefore be advanced in relation to the research hypothesis of this study. In connection with the perception of the relationship with the teacher and the internal determinants of student academic motivation, our hypothesis is that the better the teacher-student relationship, the greater the student's motivation.

The objectives of the study are:

- Analyze the predictive value of the teacher-student relationship (warm relationship, support, conflictual relationship) on the determinants of academic motivation (feeling of competence, interest, and useful value of the task and goals of accomplishment).
- Identify which aspects of the teacher-student relationship best predict each of the motivational variables selected;
- Identify which motivational variables are most affected by the quality of the teacher-student relationship;
- Check the moderating effect of sex in teacher-student relationships and motivation.

Methodology:

The purpose of this section is to present the elements selected to answer the research question and verify the hypotheses. The preferred methodology for meeting the research objectives is quantitative. The data are taken from a self-revealed item questionnaire answered by postgraduate students from five elementary schools in the Montreal region. The elements collected come from a longitudinal study on persistence and academic success (Phase 2) funded by the FQRSC which examines the impact of project 80, Ruelle de futur on performance, motivation, psychosocial adaptation and staying in school. The principal researcher of this study is Rocha Chou nard and his collaborators are François Bowen, Jean-Sebastian Fall, Pascal Lefrançois and Louise Poirier, all under the coordination of Julie Bergeron, doctoral student.

Experimentation process:

The whole research project started in September 2008 when the consent of the schools and the parents was obtained. Regarding the data used in our project, it comes from the second collection carried out during the months of May and June 2009. As this research fits into a larger research, it is essential that it undertakes to comply with the rules of the ethics certificate awarded by the Faculty of Education Sciences of Université de Montréal dated November 12, 20081. At no time were the names of participating schools or students disclosed and students whose parents refused to participate in the research were not taken into consideration when analysis. No participation was required and participating students could withdraw at any time during the process.

Participants :

A self-revealing item questionnaire used with a sample of 148 students was used for data collection. These students come from third cycle elementary classes located in the Montreal region. The sample includes 77 boys and 71 girls educated in French.

These schools welcome a large number of pupils from different ethnic and cultural backgrounds. The research assistants in charge of the assignment therefore took care to have the students complete the questionnaire by reading each question aloud. Thus, they were able to ensure everyone understands and difficulties in reading comprehension could not be considered as a bias in the results. The questionnaire was completed by the students during school hours.

Measuring instrument:

The questionnaire used is the "Questionnaire on motivation and psychosocial adjustment". It was designed by researchers in the field of education thanks to the adaptation of several scales from different validated sources in French2. The items retained in this questionnaire make it possible to collect information on the independent variable, either the student's perception of his relationship with his teacher as well as on the dependent variables, or school motivation in general through the presence of the various internal determinants of academic motivation (the goals of achievement, the feeling of competence as well as the interest and the utility value accorded to the task). In all, 125 questions are found in this tool in addition to the questions to know the age, sex, date of birth, family situation, language spoken at home, occupation and origin of parents, school results in the last report card, the school attended during the next year and finally the frequency of use of the services of a homework assistance organization and of the facilities of the Ruelle de future. The questions are mainly answered using a simplified Likert scale with four choices to ensure everyone's understanding. For the present study, only the items about academic motivation in general and its internal determinants, namely the perception of competence, interest, useful value and the orientation of learning were retained. Also, statements about perception

See dictionary of variables in appendix 2

General motivation at school is measured in terms of perception of competence (3 items, $\sim$ =, 76), interest (3 items, $\sim$ =, 78) and utility value (2 items, $\sim$ =, 82) from an adaptation of the Motivation to learn instrument in general

translated and validated by Ntamakiliro, Monnard and Gurtner (2000). The orientation measures of learning, namely performance approach (4 items, ~ =, 80) and mastery approach (3 items, ~ =, 75) come from the translation of the instrument constructed by Harackiewicz et al. (2008). Work avoidance is measured by two items (~ =, 64) from Chouinard and Bergeron (2008).

Motivation for the disciplines is measured from the perception of competence in French (4 items, ~ =, 85) and in mathematics (4 items, ~ = .90) from an adaptation by Chouinard et al. (2007) of the scale of Ntamakiliro, Monnard and Gurtner (2000). Interest in French (4 items, ~ =, 76) and mathematics (4 items, ~ =, 84) are assessed by a scale of Miller, Behrens, Greene and Newman (1993) and Pintrich and De Groot (1990) adapted by Chouinard et al. (2007). Finally, the usefulness of French (2 items, ~ =, 65) and mathematics (3 items, ~ =, 78) come from a scale by Fennema and Sherman (1976) translated by Vezeau, Chouinard, Bouffard, and Couture (1998).

Warm relationships with teachers are assessed by 4 items (~ =, 70) from the work of Boily and Bowen and two items (~ =, 78) from the translation and adaptation of the work of Pianta and Steinberg (1992) . Three items (~ =, 69) assess the conflictual relationship and three others measure the support of teachers (~ =, 75).

Mode of data processing:

As the research question attempts to verify the predictive value of the teacher-student relationship on the determinants of academic motivation, the comparisons between students were therefore made with regard to gender and according to the respondents' perception of the relationship. Thus, three variables were created in connection with the perception of the teacher-student relationship (warm relationship, support, conflictual relationship).

To begin with, a correlational analysis was performed. The bivariate correlation allows us to see the presence and the strength of the association between the variables under study taken two by two. The calculation of this association, called Pearson's correlation coefficient (r), makes it possible to verify the degree to which these variables meet around a regression line (Field, 2005). The Bivariate correlations lead us to see the strength of the relationships between two variables without knowing the cause and without taking into account the other variables. According to Field (2005), a weak relationship is around 0.1, a moderate relationship around 0.3 and a significant relationship around 0.5. So, in order to see the effects of interactions between several variables and to know the predictive power of each of the variables, we then performed multiple regression analyzes.

Overview of relationships between variables:

Table 1 will allow us to properly represent all the variables by presenting the descriptive statistics.
Depending on the response scale used, we can notice that on average, students report having positive teacher-student relationships based on the perception of warmth, support and a low level of conflict. The fairly high standard deviations, particularly for the perception of conflict, show us that the set of responses is rather heterogeneous. In terms of motivation for school in general, we note that the performance goal has the lowest average and a high standard deviation, which indicates that not all students share the same opinion. On the other hand, the feeling of competence also has a low average and a somewhat high standard deviation. Interest has a slightly higher average than feeling of competence and a similar standard deviation. The work avoidance goal also has a particularly low average which is a good thing considering the response scale used. On the other hand, the goal of mastery and the perception of the usefulness of the school have a particularly high average and a lower standard deviation, especially in the case of utility, which tells us that the overall the responses are fairly homogeneous.

In terms of subject-specific motivation, the averages corresponding to interest in both French and mathematics are very low. The low standard deviations related to its variables tell us that the set of responses is fairly homogeneous. The average feeling of competence in mathematics is higher than that in French. The fairly high standard deviations, mainly in mathematics, reveal to us that the set of responses is rather heterogeneous. Finally, the average for the perception of usefulness in the two subjects is particularly high and the standard deviations are moderately high.

Table I: Descriptive statistique				
	Average	Standard deviation	Minimum	Maximum
Heat	3,18	0,75	1,3	4,1
Support	3,24	0,75	1,0	4,0

Conflict	3,13	0,84	1,0	4,0
Feeling comp.	2,95	0,74	1,0	4,0
Interest	3,07	0,74	1,0	4,0
Utility	3,81	0,34	2,1	4,1
Performance goal	2,65	0,87	1,0	4,0
Mastery goal	3,70	0,57	1,34	4,1
Avoidance goal	1,37	0,62	1,0	4,0
S. comp. math.	3,01	0,86	1,0	4,0
S. comp. Fr.	2,74	0,74	1,0	4,0
Math interest.	2,45	0,36	1,6	3,76
Interest fr.	2,40	0,41	1,0	3,6
Useful math.	3,78	0,69	1,0	4,0
Utility fr.	3,76	0,69	1,0	4,0

Predictive value of the teacher-student relationship on academic motivation:

In order to meet our research objectives which are to analyze the predictive value of the teacher-student relationship on the determinants of academic motivation, to identify which motivational variables are most affected by the quality of the relationship and to identify which aspects of the relationship best predict each of the motivational variables, we performed a series of multiple regression analyzes. One of the objectives, in connection with the literature, is also to verify the moderating effect of sex in relationships. Indeed, we can expect girls to report perceiving a more positive relationship (based on warmth and support) compared to boys who generally report more conflict (Wentzel, 1994; Murray and Murray, 2004).

Teacher-student relationship and academic motivation in general:

With regard to Table 3, we can see that the feeling of competence has few statistically significant relationships with the teacher-student relationship. Indeed, it is only predicted by the perception of support in the relationship. The model would explain 6% of the variance (R2) of the feeling of competence. Interest, on the other hand, has two statistically significant relationships. A positive and statistically significant relationship is visible with the warm relationship. Conversely, there is a negative relationship between interest and the perception of conflict in the relationship. This model explains 35% of the variance in interest. On the other hand, utility could be predicted negatively by the perception of a conflictual relationship and 11% of variance is explained by the model.
We can also say that the variables do not present a problem in terms of collinearity because the tolerance is between, 4 and, 98 and the VIF between 1.02 and 2.45.

Perception of the relationship with the teacher:

Now let's look at the results from the perspective of the perception of the relationship with the teacher. The perception of a warm relationship has a predictive force both on the general interest and on the interest in both disciplines. However, his predictive power is greater when it comes to general interest in school. On the other hand, the perception of a supportive relationship could predict the feeling of competence and could negatively predict goals for avoiding work. The supportive relationship is also associated with a feeling of competence, interest and usefulness in mathematics. Finally, the perception of a conflictual relationship presents several negative associations. Specifically, there is a statistically negative

relationship with general interest and in French and utility in general. There is also a positive association between the conflicting relationship and the goal of avoiding work.

In summary, we find that the perception of support in the relationship with the teacher is the variable with the most statistically significant relationships with the determinants of academic motivation. Indeed, it would predict five of the twelve motivational variables. The perception of conflict in the relationship is also statistically significantly associated with four of the motivational variables. Finally, the perception of a warm relationship presents an association with the three motivational variables related to interest. It is also interesting to note

Discussion:

In the context of this study, we sought to verify the impact of the teacher-student relationship on the motivation of students, particularly in disadvantaged areas. Our hypothesis stated that the better the teacher-student relationship, the greater the student's motivation. The master-student relationship being inscribed here in the angle of attachment theory, the variables defining it were the warmth in the relationship, the support as well as the level of conflict, a low level of conflict as well as a level high warmth and support being associated with a positive relationship (Davis, 2003). For its part, academic motivation was assessed at two levels, general and specific to French and mathematics. Some of the determinants retained are linked to the Expectation-Value models, namely the feeling of competence, the interest and the perception of the usefulness of the school in general as well as in French and in mathematics. The other determinants retained are related to the theory of achievement goals, namely the goal of mastery, the goal of performance and the goal of avoiding work.

In order to verify our hypothesis of the role of the teacher-student relationship in student motivation, our objectives were first to analyze the predictive value of the teacher-student relationship on the determinants of academic motivation in order to identify which aspects of the teacher-student relationship best predict each of the motivational variables selected and finally to identify which motivational variables are most affected by the quality of the teacher-student relationship. We also checked the moderating effect of gender in the relationships between attachment variables and motivation.

What relational variables best predict motivation?

According to the literature, a relationship with the teacher perceived to be positive has several beneficial effects for students (Green et al., 2008; Moss, 2005; Murray and Pianta, 2007; Wentzel, 1998). The relationship perceived to be negative, on the other hand, would have harmful effects on student education (Hudley, Daoud, Hershberg, Wright-Castro and Polanco, 2002; Murray and Greenberg, 2001). The results of our research abound in the same direction. Indeed, our three variables related to the teacher-student relationship presented relationships with several motivational variables that allow us to confirm the importance of a quality teacher-student relationship.

Our results also show that the perception of conflict has negative relationships with interest and perception of general utility as well as with interest in French. The perception of conflict in the relationship also seems to interact but positively with the adoption of work avoidance goals. This is logical considering that a student who perceives a conflictual relationship will tend to adopt behaviors that harm academic success (Pianta and Steinberg, 1992). These results are linked to other results present in the literature which link the perception of conflict to a decrease in motivation in terms of increased avoidance behavior, less interest, development of negative attitudes towards school and ultimately the decrease in academic success (Birch and Ladd, 1997; Birch and Ladd 1997; Pianta and Steinberg, 1992). In fact, for students, teachers are the representatives of the school in general. So, by feeling in conflict with them, one may think that the pupils will pay less interest and have a lesser perception of the usefulness of the school.

These results are not surprising and lead us to argue that the perception of a positive relationship would make it possible to expect greater academic motivation (Chouinard et al., 2007; Marks, 2000; Montalvo, Mansfield and Miller, 2007; Murray and Pianta, 2007; Wentzel, 2002).

This result is quite surprising considering that boys generally report having poorer relationships with their teachers. Since the teacher-student relationship partially predicts academic motivation and boys report poorer relationships, we might expect less motivation from boys. That said, our results do not support this hypothesis. So we can conclude that within our sample boys have a motivation similar to that of girls. This in itself is a positive element and as pointed out by Malecki and Demaray (2003), the different relationships maintained, including the relationship with the teachers, are important for adolescents and it is not clear whether the girls, who generally perceive better relationships, have really

better relationships. With this in mind, the authors add that it would be important to ensure that boys, who generally perceive less good relationships, also receive the support they need.

These results could be linked to the small size of our sample. They could also be due to the presence of male teachers in the classes sampled. Indeed, one might think that boys would tend to perceive more positive relationships with a teacher of the same sex, which could reduce the moderating effect of sex on the motivation of the students present in our sample.

Results:

To evaluate a validity of a hypothesis with determine a level of math among a students in the paper sample, a mathematical averages with standard deviation of their scores were extracted on a math intelligence test. To find out a significance of the difference between a hypothetical averages and a arithmetic averages of the score of the paper sample students , the T Test was used for one sample, table (2).

Table (2)

Significance of the differences between the scores averages of the research sample students on the mathematical intelligence test

Type of Intelligence	Sample Size	Hypothetical Averages	Arithmetic averages	Standard deviation	Calculated Z value	Tabular Z Value	Level of significance	Percent weights
Male	108	11,5	10,89	3,006	2,15 -	1,98	Sign	47%
Female	103	11,5	12,07	2,770	1,74	1,98	Not Sign	52%
All Students	208	11,5	11,35	2,940	0,66 -	1,96	Not Sign	49%

The results of Table (2) see a following:

❖ The tabular t-value is greatest than calculated, i.e., a differences are statistically insignificant between a accepted mean of a math intelligence scores and a arithmetic mean of the scores of (each a students, with female students) on the test, although a arithmetic mean of the female student is higher than a hypothetical averages, and statistically significant for male student as a calculated t value is greatest than a tabular.

❖ A percentage of the students' scores were as follow: Student in general is (49%) and a male student is (47%), which is low. they have mathematical intelligence but at a lower level than acceptable performance level. As for a percentage weight of female samples, it was (52%). These mean that they have math at a level slightly high level than accept performance level

The results of the second hypothesis:

To test a hypothesis, and to know a significance of a difference between a averages of score of the researcher sample student in the math intelligence test by gender variable, the t test was used for 2 independent samples, Table (3):

Table (3)

Significance of a difference between a average score of the researcher sample student on a math intelligence test by gender variable

Variable	Gender	Samples Size	Hypothetical Average	Arithmetic averages	Standards deviation	Calculated t value	Tabular t Value	Levels of significance
Math Intelligence	Male	108	11,6	10,89	3,006	3,242 -	1,97	States significant
	Female	103		12,07	2,713			

The results of Table (3) see that a calculated t value is high than the tabular. These mean that a difference is statistic significant at a level of significance (0.05) between a average score of the researcher sample student and for female student.

Conclusion:

Our study therefore allowed us to confirm our initial hypothesis which stated that the better the teacher-student relationship, the greater the student's motivation. Our results abound along the same lines as the literature and show that,

within our sample, the teacher-student relationship plays an important role in the presence of academic motivation (Archambault and Chouinard, 2009; Reeve, 2006; Viau , 1997; Wentzel, 1998).

Contribution of the study to the advancement of knowledge:

Faced with the results obtained, we can confirm the impact of the teacher-student relationship on student motivation. Indeed, it is interesting to note the scope of this relationship on the different determinants of motivation. Our results support previous research in the field while approaching the relationship from a less exploited angle. Indeed, given that the majority of studies refer to this relationship in connection with teaching practices and classroom management (Fallu and Janosz, 2003), our study brings a different contribution in connection with the affective aspect of the relationship.

It is also possible to see the positive impact that certain structures could have on the development of the teacher-student relationship such as small class sizes. Also, in the light of these results, it would be interesting for school administrators to provide teachers with more time to carry out individual monitoring of their students and thus promote the teacher-student relationship. In short, there are many possible ways to improve the quality of relationships between teachers and students. On the other hand, it seems essential that the teacher invests emotionally with his students by creating a quality relationship, that is to say by providing a high level of support, by demonstrating warmth in the relationship and especially in trying to reduce the level of conflict.

Despite its interesting results, this study still has certain limitations. Desirability bias could be present considering the fact that the students may have responded in order to please their teacher. Also, the reduced number of classes present in our sample brings a certain limit in the generalization of our results. Then, as our sample comes from regular French-speaking classes in the Montreal region, the generalization of the results turns out, once again, to be more difficult. From this point of view, it would have been interesting to see the difference between students in regular classes and students in special classes with learning disabilities or behavioral disorders which basically have a lower motivation (Chouinard, Plouffe and Roy , 2004). Also, the context of special classes with their limited number of pupils could have presented an interesting comparison and brought about new results.

In addition, since our sample consisted only of students from schools located in disadvantaged areas, it would have been interesting to present a sample from non-disadvantaged areas. The addition of this control group would have allowed us to compare the specific effect of the teacher-student relationship on students from disadvantaged backgrounds.

Also, since the relationship with the teacher is one of a set of variables that can affect student motivation, it would be interesting, particularly in the case of the feeling of competence, for future research to verify the effect of the variables relating to family and friends. Thus, the effect of the perception of the relationship with the teacher could be isolated. Also, since the questions in our study make it possible to measure the individual interest of the students, it would be interesting to check the impact of the situational interest and thus see the contribution of the different teaching practices on the motivation of the students. In addition, the data comes from a single collection time, so it would be interesting for future research to compare the data from the beginning and the end of the school year. This research could even be done using longitudinal data to see the impact of the teacher-student relationship on the school career and its influence on motivation over the years.

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Annex 1

Evaluation of Project 80, Lane of the future Dictionary of variables * students *

~= internal consistency of Cronbach's alpha (scale reliability indicator. The closer you get to 1, the more reliable the scale is)

INV * = inverted item (which does not go in the same direction as the measured variable).

FALSE			TRUE	
Wrong	Wrong		True	True
1	2		3	4

Motivation to learn in general

Perceptions of competence at school (4 items, ~ =, 76)

1. I am proud of my results at school.

4. I'm as good at school as the rest.

7. INV * I am not very good at school.

10. INV * I am not as good at school as the others.

General interest (4 items, ~ =, 78(

2. What I learn in school interests me.

5. I like going to school.

8. What we do in class is interesting.

11. INV * I often get bored in class.