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PROGRAMME ACTIONS CONCERTÉES

**BOURSES DE RECHERCHE POSTDOCTORALES**

**Comment la relation maître-élève est-t-elle relié à  
l'engagement scolaire et la  
réussite scolaire au primaire ?**

**Chercheure postdoctorale  
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## Summary

Drop-out rates and academic underachievement remain comparatively high in the province of Quebec. In the interest of public health, an important concern remains reducing socioeconomically-based disparities in education. An important question therefore becomes, which student skills and features of the schooling environment should be targeted to reduce socio-economically based disparities in achievement? Promoting children's readiness to learn at kindergarten may represent one of the most efficient ways to improve academic outcomes across the population. Nevertheless, additional contextual influences on children's adjustment to school, such as relationships with teachers, are also likely to influence children's engagement and academic progression.

The present research employs an ecological and neuroscience perspective to attempt to identify modifiable targets for intervention that would be likely to improve achievement in disadvantaged youth. Because they are narrowly related to socioeconomic status as well early achievement and school readiness, neuroscientists increasingly suspect that efficient educational strategies should include components that foster child cognitive control and strong learning skills that enhance the acquisition of knowledge. In addition, beyond children's own competencies, the characteristics of classroom environments may also contribute to children's academic experience. Teachers are likely to hold more negative expectations of the academic ability of disadvantaged and ethnic minority students. Eventually, the expectations teachers hold of students can have consequences for their academic performance. Consequently, according to ecological perspective, a better examination of how broader socio-cultural influences may simultaneously shape the school experiences of disadvantaged and minority children is warranted.

A first study examines the importance of cognitive control relative to other cognitive functions such as general intelligence, speed of cognitive processing, and verbal skills for explaining socioeconomically-based disparities in achievement. The hypothesis is that cognitive

control will be uniquely associated with academic achievement outcomes, even once other cognitive functions and child characteristics (age and gender) are controlled. The second hypothesis is that cognitive control will significantly account for part of the association between socioeconomic status and academic achievement even when additional cognitive functions and child characteristics are controlled.

A second study uses a person-centered approach to examine how child profiles of school readiness in terms of intellectual and classroom engagement skills reflective of cognitive control, predict eventual achievement above and beyond disadvantage. A first hypothesis is that distinct risk profiles can be detected on the basis of math and reading skills, general IQ, and classroom engagement. A second hypothesis is that children showing profiles characterised by higher engagement and better academic and intellectual skills would also show better achievement four years later regardless of socioeconomic status.

A third and fourth study address whether visible minority students and students showing visible signs of disadvantage experience less supportive classroom environments as reflected by self-reported relations with teachers and academic motivation and self-concept. We also examine teacher-rated academic adjustment. We hypothesize that visible minority and disadvantaged students will experience poorer academic adjustment.

Our research was based on data from two international data sets. A first data set is from 226 English-speaking American children between the ages of 3 and 5 years ( $M = 56.88$ ,  $SD = 9.06$ ) attending daycares in New York City. The second data set is the Quebec Longitudinal Study of Child Development (QLSCD 1998-2010), which comprises a 1997-1998 birth cohort of 2,120 children born in the province of Quebec.

In the first study we found that cognitive control independently predicted academic ability, after controlling for general fluid intelligence and speed of cognitive processing. We also found that cognitive control but not general fluid intelligence or speed of cognitive processing, accounted in part for the effect of socioeconomic disparities on academic readiness indicators.

When we controlled for vocabulary, cognitive control continued to account for variation in math, but not letter-word recognition ability attributable to socioeconomic status.

In the our second study, we found three distinct groups of kindergarten readiness which differed on the basis of their academic, intellectual, and classroom engagement profiles. The majority of children in our population-based sample tended to show an adaptive pattern of school readiness, characterized by high scores on all of the kindergarten skills. The two remaining groups of children demonstrated less than optimal levels of school readiness. Although both of the at-risk groups showed low levels of receptive vocabulary and fluid intelligence, one group scored higher on kindergarten number knowledge and classroom engagement.

How children started off school was related to how well they fared later on in elementary school, with children showing a profile characterised by high scores on intellectual skills and classroom engagement experiencing the most success 5 years later. Furthermore these associations were above and beyond socioeconomic status. We also found that children showing a pattern of lower scores on intellectual assessments but moderate classroom engagement were more successful than similar peers with low classroom engagement. These results suggest that, even when combined with poor intellectual skills, classroom engagement and cognitive control may still benefit children's achievement regardless of socioeconomic status.

Studies 3 and 4 examined whether as children become aware of social stereotypes towards stigmatized social groups, additional influences may also come to bear on their academic adjustment. We found that Black or Native children, as well as children who were perceived by teachers as showing signs of disadvantage (e.g., by being inadequately dressed, or coming to school hungry and tired) perceived their relations with teachers as less supportive. These children were also perceived as less competent in the classroom and reported lower levels of academic motivation. These observed associations persisted regardless of measures of student academic risk, family socioeconomic status, gender, family relationship quality, and classroom engagement behavior.

Cognitive control training programs have been shown to provide the most benefit to children showing the highest initial deficits and risks for poor cognitive control. This suggests that interventions are a promising avenue for reducing educational disparities. In the context of the present findings it is possible to identify several promising and potentially effective courses of action. First, cognitive control skills can be cost-effectively enhanced through teacher-training. Training teachers to use a combination of Tools of the Mind curriculum and *CogMed* computer training is likely to represent an especially efficient strategy for reinforcing cognitive control. In addition the added benefit of incorporating psychomotor training and aerobic activity should be examined through empirical research.

Finally, the current findings suggest that more efforts be directed at assessing the potential influence of stereotypes in the classroom. The pervasiveness of media and screens ensures that all individuals are bombarded with negative stereotypical messages and images of stigmatized social groups. Furthermore, In Quebec, low birth-rates, rising immigration, and a growing gap between the rich and poor ensure that teachers will face increasingly diverse and disadvantaged students. Furthermore, recent social policies such as Quebec's charter of rights, which draw increased attention toward the physical appearance of visible minorities, are likely to reinforce cognitive processes that contribute to negative stereotyping.

Taking explicit steps to reduce negative social stereotypes in the elementary classroom, through on-going teacher training and workshops may help overturn the gradual process of school disengagement observed in many disadvantaged students. Consequently, as children become mindful of stereotypes aimed at different social groups, teachers may find it useful to discuss discrimination and group differences in the context of group discussions. Teachers may also find it useful to address such topics by inviting members of socially stigmatized groups to present their experiences of stigmatization to the classroom to help build tolerance and empathy.

