

DIFFERENCES IN ACHIEVEMENT BETWEEN  
ADOLESCENTS WHO REMAIN IN A K-8  
SCHOOL AND THOSE WHO TRANSITION TO A  
JUNIOR HIGH SCHOOL

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There has been abundant research examining how early life experiences affect achievement. In this article, we investigate the transition from elementary to junior high school at a developmental stage where numerous changes have an impact on students. Using nationally representative survey data, we found no differences in academic achievement between students who transitioned to grade seven from an elementary school in comparison to those who remained in the same school. We did find a significant decline in mathematics achievement between grade five and grade seven for children, regardless of their transition status. We present a developmental, rather than environmental, explanation.

Key words: school adjustment, adolescent development, mathematics achievement

Il existe de nombreuses recherches sur l'effet des expériences vécues durant l'enfance sur la réussite scolaire. Dans cet article, les auteures étudient la transition d'une école primaire à une école secondaire du premier cycle à un stade du développement où de nombreux changements ont un impact sur les élèves. Se servant de données d'enquête représentatives à l'échelle nationale, les auteures n'ont trouvé aucune différence dans le rendement scolaire entre les élèves qui sont passés en 7<sup>e</sup> année dans une autre école par rapport à ceux qui sont restés à la même école. Elles ont noté toutefois une diminution importante des notes dans les examens de mathématiques entre les enfants de 5<sup>e</sup> année et ceux de 7<sup>e</sup> année, transition ou non. Il s'agirait, selon les auteures, d'une question de développement plutôt que de milieu.

Mots clés : adaptation scolaire, développement à l'adolescence, rendement scolaire en mathématiques

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The transition from elementary to junior high school is an important step in students' school experience. However, this phase has also long been associated with a decline in academic performance (Alspaugh, 1998; Barber & Olsen, 2004; Zanobini & Usai, 2002), and student perceptions of academic competence and self-esteem (Cantin & Boivin, 2004; Wigfield & Eccles, 1994; Wigfield, Eccles, MacIver, Reuman, & Midgley, 1991; Zanobini & Usai, 2002). Leading researchers have suggested that the transition to junior high school and the associated difficulties experienced by students contribute significantly to numerous negative long-term outcomes including high school drop out, social and emotional difficulties, and frequent alcohol and drug use (e.g. Eccles, Lord, Roeser, Barber, & Hernandez Jozefowicz, 1997).

Although a general consensus regarding the deleterious effects of this transition phase has existed for some time, researchers have only recently begun to examine these findings in more depth. New areas of study include social, personal, and school-related correlates of academic decline (Barber & Olsen, 2004; Grolnick, Kurowski, Dunlap, & Hevey, 2000), the influence of peer networks (Aikins, Bierman, & Parker, 2005), and the differential effects of transition on various subgroups of students (Anderman & Midgley, 1997; Forgan & Vaughn, 2000; Wampler, Munsch, & Adams, 2002). As well, Canadian researchers are beginning to question the applicability of U.S. findings for Canadian students following recent findings (Cantin & Boivin, 2004; Lipps, 2005). The

purpose of the current study, then, is to examine the academic effects of transition from elementary school on a national sample of Canadian students.

#### STAGE-ENVIRONMENT FIT THEORY

Eccles and her colleagues (Eccles & Midgley, 1989; Eccles et al., 1993) have suggested a developmental variant on the *person-environment fit* theory (Hunt, 1975) which they have termed the *stage-environment fit* theory. According to this theory, students will experience declines in motivation and performance if their educational environment does not support their current developmental stage and promote continued cognitive and emotional developmental growth. It is the fit, then, between the developmental trajectory and the environmental change trajectory that determines the motivational consequences. For a student progressing through early adolescence, changes in the educational environment occurring as a result of the transition to junior high school may not be entirely appropriate, and students may experience academic difficulties as a result.

Environmental changes that distinguish elementary from junior high school occur in many critical areas. First, junior high school students have multiple subject-based teachers, thus reducing the salience of the relationship between student and teacher, which has been found to be crucial to students' achievement motivation (Murdock & Miller, 2003; Simmons, Burgeson, Carlton-Ford, & Blyth, 1987). Second, elementary schools typically offer more choice and control over various aspects of the learning environment; whereas junior high schools focus more on academics and discipline (Midgley, Feldlaufer, & Eccles, 1988). Other differences include a decreased emphasis on individualized instruction and a greater focus on ability grouping and whole group instruction in junior high school. Coupled with this is the finding reported in a small number of studies that, although student performance on standardized tests does not change, class-awarded grades drop when students enter junior high school (e.g., Simmons et al., 1987). This finding suggests that teachers in grade seven may hold higher standards for student performance. The stage-environment fit theory (Eccles & Midgley, 1998; Eccles et al., 1993) suggests that these types of changes are detrimental to

the needs of students and can result in declines in motivation and subsequently achievement.

The explanation of stage-environment fit for a decline in achievement is supported by research that shows a greater decline in achievement for students who changed schools for grade seven, as compared to those who remained in K-8 schools (Alspaugh, 1998; Simmons et al., 1987). There are several explanations for these results. Because of a possible mismatch between student learning needs and classroom support, students may not feel motivated in their schoolwork and, thus, experience declines in achievement. Although student motivation may decrease as a result of lower grades, the shift in teacher grading criteria is another plausible explanation for the decline in achievement (Eccles et al., 1993; Wampler, et al., 2002). Teachers may hold higher standards for students and assign them lower grades than their elementary teachers. As a final point, grade-seven teachers in K-8 settings may operate more similarly to grade-six teachers compared to those in junior high schools who work in an environment more focused on academics and ability streaming.

#### SCHOOL TRANSITION AND ACADEMIC ACHIEVEMENT

Several studies have shown that academic achievement declines significantly when students enter junior high school (Alspaugh, 1998; Grolnick et al., 2000; Zanobini & Usai, 2002). However, it is important to distinguish between the various measures of achievement that are employed in this line of research. Clearly, if teacher standards have increased, which is one explanation for decline in student achievement, differences should be seen in grades but not in standardized achievement tests. As well, if motivation has decreased during transition, as suggested by Eccles et al. (1993), student self-ratings of academic achievement should decline as well.

##### *Standardized Tests*

Some research suggests that students who transition to junior high school obtain lower standardized test scores than students who remain in elementary school. Accordingly, Alspaugh (1998) found that the average district score on the Missouri Mastery and Achievement Tests

increased for students in K-8 schools as they entered grade six. However, the average score of students who moved to a junior high school decreased significantly. Similarly, Simmons et al. (1987) compared the standardized math test scores of students who remained in a K-8 school to the scores of students who transitioned to a junior high school in grade seven. They found that, although the scores of both groups of students improved from grade six to grade seven, increases were significantly lower for students who moved to a junior high school.

#### *Teacher Ratings*

Similar findings are reported when teacher-assigned grades are used as a measure of achievement. Simmons et al. (1987) found that students who moved to junior high school in seventh grade experienced a greater drop in teacher assigned grades than students who remained in K-8 schools. Indeed, the advantage for the K-8 students in grade seven was approximately half a letter grade, in comparison to children who moved to a junior high school. These findings support the explanation that junior high school teachers use more competitive standards for grading students. They also support the suggestion that a transition from elementary to junior high school involves a number of changes and adjustments that may impact the learning and academic development of students.

#### *Student Ratings*

Students' perceived academic competence, as one measure of achievement, has been found to decline over the transition from elementary to junior high school. Certainly student ratings reflect, in part, feedback from teachers, parents, and peers concerning their achievement; however, they also reflect a certain amount of subjective perception of relative standing, confidence, and self-esteem (Marsh & Hattie, 1996). Several studies have shown that students' ratings of their competence in English and mathematics declined significantly following transition to junior high school. The trend was linear, indicating that ratings did not return to earlier levels after an initial settling-in period (Anderman & Midgley, 1997; Wigfield & Eccles, 1994; Wigfield et al.,

1991). Overall, these results suggest a negative impact of school transition on achievement.

#### *Canadian Schools*

In Canadian schools, as in the United States, the type of elementary school that students attend (i.e., K-6, K-8) varies both across and within provinces. For example, in Alberta, schools offer various grade ranges including kindergarten to grade four, six, or nine, as well as junior high schools that include grades five to eight, or seven to nine. Recently, researchers in Canada have begun to examine the transition from elementary to junior high school (Cantin & Boivin, 2004; Hardy, Bukowski, & Sippola, 2002; Lipps, 2005). Specifically, Cantin and Boivin (2004) followed 200 French-speaking students from grade six through grade nine. All students moved from an elementary to a junior high school in grade seven. The authors found that, contrary to their expectations, student reports of support in relationships with school friends and social acceptance increased following the transition. However, student self-perception of academic competence decreased over this time period.

Lipps (2005), using data from the National Longitudinal Survey of Children and Youth (NLSCY) (Statistics Canada, 1997), examined the academic and psychological adjustment of Canadian students who stayed in the same school, moved to junior high school, or moved to high school. He found that, contrary to the studies conducted in the U.S.A., students' scores on a standardized mathematics test were not related to transition.

These studies suggest that students in Canadian schools may experience the transition to junior high schools somewhat differently from students in the United States. However a systematic examination of the impact of school transition on the academic achievement of Canadian students has yet to be conducted.

#### *Present Study*

The present study investigated the effect of type of transition (no transition, elementary to junior high school) on student achievement. Based on the extant literature and Eccles' (Eccles et al., 1993) stage-

environment fit theory, we hypothesized that students who moved from an elementary to a junior high school would experience a greater decline in achievement than students who changed grades but stayed in the same school.

## METHOD

### *Participants*

The sample includes 714 students who were part of the National Longitudinal Survey of Children and Youth (NLSCY) (Statistics Canada, 1997). The NLSCY database contains national stratified data and is maintained jointly by Statistics Canada and Social Development Canada (SDC; formerly Human Resources and Skills Development Canada). According to Human Resources and Skills Development Canada (HRSDC, 1996),

The National Longitudinal Survey of Children and Youth (NLSCY) was developed with the objective of collecting data to identify risk factors for Canadian children, thereby improving society's understanding of the important process of child development. It is expected that information from the NLSCY will provide strategic insight for the formulation of more effective programs and policies for children at risk. (p. i)

Data are collected every two years beginning in 1994-1995. The unit of analysis in the NLSCY is the child. Surveys are completed by a child's parents, teachers, and, for children over the age of 10, themselves. Topics within the surveys include the physical, emotional, and cognitive development of a child, parenting practices, education-related factors, and influences such as peers, schools, and the larger community (Statistics Canada, 1997).

The sample for the present study included adolescents moving from grade five to grade seven who participated in cycles 2 and 3 of the NLSCY. These data were collected in 1996-1997 and 1998-1999, respectively. Students were included in our sample if they participated in the NLSCY at both cycles. Furthermore, inclusion in the sample was limited to students who were in grade five in cycle two and in grade seven in cycle three. For each student, data from their self-report, as well

as parents' and teachers' reports, were included for analyses.

### *Measures*

*School transition.* A series of items on the self-report questionnaire explore the elementary to junior high school transition. First, students were asked if they are in the same school as they were two years previous (i.e., since the previous NLSCY cycle was conducted). Because all students in the sample were in grade five in cycle two and grade seven in cycle three, those who answered "Yes" to the preceding question were assumed to be attending a school that continued at least to grade seven. These students comprised the "No Transition" group, approximately fifty-six per cent of the total sample.

Students who responded that they did not attend the same school as two years ago were then asked the reason for the change in schools. Students who indicated that this was due to moving from elementary to junior high school comprised the "Transition" group, approximately 44 per cent of the total sample.

*Achievement ratings.* Student self-report, and teacher and parent reports of achievement were included in the analysis. Students responded to the question, "How are you doing in your schoolwork?" on a five point scale (1 = very poorly to 5 = very well). This item was identical in both cycles.

Teachers rated student achievement in three areas: across all areas of instruction, in reading, and in mathematics. In cycle two, when students were in grade five, teachers responded to the following series of questions: How would you rate this student's current academic achievement across all areas of instruction?, How would you rate this student's current academic achievement in reading?, and How would you rate this student's current academic achievement in mathematics? Teachers responded on a five-point scale ranging from: 1 = near the bottom of the class to 5 = near the top of the class. Surveys were completed by a single teacher, as students were all in elementary schools at this point.

In cycle three, surveys were completed either by a single teacher for those students who had only one teacher, or by both language arts and mathematics teachers if students had multiple teachers. Questions and



response options were identical to those listed above. For students with multiple teachers, the language arts teacher rated students in reading and the mathematics teacher rated students in mathematics. For achievement across all areas of instruction, the overall ratings were averaged between the language arts and mathematics teachers.

Parent surveys were completed by the person most knowledgeable about the child, which was usually the mother (97%). Parent ratings of achievement were derived from the following items: Based on your knowledge of your child's school work, including his/her report cards, how is your child doing in the following areas at school this year: (a) Reading? (b) Mathematics? (c) Overall? Parents responded on a five-point scale ranging from 1 = very poorly to 5 = very well.

#### *Procedures*

We first selected all grade-seven students in cycle three because this is the most complete cycle. We then matched them by identification numbers to cycle two students in grade five. Any student who did not appear in both cycles was excluded from the sample. This procedure resulted in a longitudinal sample of students who were in grade five in cycle 2 and grade seven in cycle 3. Finally, we merged parent and teacher data files from both cycles into the student data file. To account for missing values, we deleted cases listwise because the initial sample was quite large in relation to the missing data. Frequencies and means were calculated for the sample using standardized longitudinal weights provided by Statistics Canada. Statistics Canada recommend the use of longitudinal weights for analyses of NLSCY data because they adjust the data for the sample to render it nationally representative for the years when the data were collected (Statistics Canada, 1997). Thus the scores of one child may represent three hundred children in a particular geographic region of the country.

A series of differential variables was created to measure the effect of transition on achievement. For each measure of achievement (self ratings, teacher ratings, and parent ratings), ratings from cycle three were subtracted from cycle two ratings. For example, if parents rated their child as performing at 5 = very well in mathematics in cycle two, and then rated them at 3 = average in cycle three, their difference score

would be -2. If they rated their child as performing at 1 = very poorly in cycle two and a 3 = average in cycle three, then their difference score would be 2. These scores represent the change in achievement from cycle two to cycle three.

### *Analyses*

We conducted a series of repeated measures ANOVAs to determine whether teacher, parent, and student reports of achievement changed from grade five to grade seven regardless of transition status. As well, the effect of transition status (no transition, transition) on differences in achievement (teacher ratings, parent ratings, and self ratings) was investigated in a series of univariate ANOVAs. We also included gender as an independent variable to determine whether there was an interaction with transition status. Finally, we conducted descriptive analyses of the responses of students on a series of items examining potential areas of difficulty in their new schools.

## RESULTS

### *Descriptive*

The demographic characteristics of the students and their families are summarized in Table 1. The number of children included in the sample is shown, followed by the weighted percentage. An approximately even number of boys and girls was included in this sample. The majority of parent respondents attended post-secondary school and reported a household income greater than \$40,000. Consistent with the population of Canadian provinces, the majority of the respondents resided in Ontario, followed by Québec (Statistics Canada, 1997). The current study is representative of 10 provinces, excluding the Territories.

### *Overall Transition*

Repeated measures ANOVAs revealed some significant differences in student achievement from grade five to grade seven for both Transition and Non-Transition students (see Table 2). Although teacher ratings of overall achievement did not vary significantly,  $F(1, 344) = .22, p < .637$ , partial  $\eta^2 = .00$ , their ratings of reading and mathematics achievement did change significantly between grade five and grade seven,  $F(1, 266) =$

12.56,  $p < .001$ , partial  $\eta^2 = .04$  and  $F(1, 304) = 9.01$ ,  $p < .003$ , partial  $\eta^2 = .03$ , respectively. Teachers rated students in grade seven as performing at significantly higher levels in reading and significantly lower levels in mathematics. Similarly, parents did not rate their children's overall achievement as significantly different in grade seven than in grade five,  $F(1, 603) = .20$ ,  $p < .655$ , partial  $\eta^2 = .00$ . Parent ratings of reading did not differ significantly over time,  $F(1, 637) = 3.25$ ,  $p < .072$ , partial  $\eta^2 = .00$ , but ratings of mathematics achievement were significantly lower in grade seven than grade five,  $F(1, 640) = 4.77$ ,  $p < .030$ , partial  $\eta^2 = .03$ . Finally, students rated their overall achievement significantly lower in grade seven than grade five,  $F(1, 621) = 12.54$ ,  $p < .001$ , partial  $\eta^2 = .02$ .

Parents and teachers reported no difference in overall achievement, whereas students reported lower achievement in grade seven than grade five. Parents and teachers reported lower achievement in mathematics in grade seven but only teachers reported an increase in reading achievement in grade seven. Effect sizes for all differences were small, however.

*Table 1*  
*Demographic Characteristics of Students (n = 714)*

Variable	<i>n</i>	%
Gender of child		
Male	361	50.7
Female	353	49.3
Education of parent		
Less than high school	91	10.3
High school	129	17.8
Some post secondary	197	27.5
College/university	297	44.4
Household income		
<\$20,000	55	8.6
\$20,000 – 29,999	62	7.7
\$30,000 – 39,999	89	9.9
>\$39,999	508	73.4
Province		

British Columbia	39	7.8
Alberta	75	12.3
Saskatchewan	58	3.8
Manitoba	63	5.7
Ontario	176	37.9
Québec	114	24.0
New Brunswick	41	2.4
Nova Scotia	42	3.0
P.E.I.	23	0.8
NFLD	44	2.3

*Note:* Percentages were calculated using longitudinal child weights

*Table 2*  
*Means and Standard Deviations of Parent, Teacher, and Student Ratings of*  
*Achievement of Total Sample across Cycles*

Variable	Cycle 2		Cycle 3	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Teacher overall	2.47	1.26	2.45	1.24
Teacher reading	2.43	1.44	2.68	1.22
Teacher math	2.59	1.22	2.41	1.34
Parent overall	3.20	0.91	3.19	0.86
Parent reading	3.15	1.00	3.09	0.98
Parent math	3.19	0.98	3.11	0.96
Student overall	3.16	0.83	3.03	0.85

*Note:* Achievement ratings are on a scale from 1 (Very Poorly/Near the bottom of the class) to 5 (Very Well/Near the top of the class).

#### *Transition Status*

None of the interactions between achievement and transition status was significant, indicating that students' difference in achievement over the transition period did not vary according to whether they stayed in the same school or moved to a junior high school in grade seven (see Table 3). As well, the interaction between transition and gender was not significant for teacher, parent, or child ratings of achievement.

*Student Report of Transition Difficulties*

Students who reported that they had changed schools for grade seven were asked to endorse various areas of potential difficulty related to the move. Approximately half the students who changed schools responded that they did not have any problems with the transition ( $n = 190$ ). Of those who did report problems ( $n = 176$ ), the areas of difficulty chosen most often from a list of possibilities were organizing homework (48%,  $n = 85$ ), getting used to new teachers (45%,  $n = 80$ ), changing classes (45%,  $n = 79$ ), and making new friends (45%,  $n = 79$ ).

Table 3  
Means and Standard Deviations of Parent, Teacher, and Student Ratings of Achievement by Transition Group across Cycles

Variable	Cycle 2		Cycle 3		Difference score	
	M	SD	M	SD	M	SD
Teacher overall						
No transition	2.38	1.22	2.52	1.21	0.08	0.82
Transition	2.48	1.31	2.57	1.28	-0.02	0.91
Teacher reading						
No transition	2.44	1.37	2.44	1.24	-0.16	0.97
Transition	2.42	1.32	2.38	1.33	-0.25	1.20
Teacher math						
No transition	2.24	1.14	2.50	1.27	0.24	0.97
Transition	2.37	1.28	2.65	1.31	0.21	0.95
Parent overall						
No transition	1.81	0.92	1.87	0.92	0.04	0.78
Transition	1.88	0.95	1.81	0.88	-0.03	0.80
Parent reading						
No transition	1.88	1.00	1.95	0.97	0.09	0.85
Transition	1.86	0.96	1.89	0.98	0.07	0.87
Parent math						
No transition	1.85	1.01	1.87	0.98	0.03	0.87
Transition	1.82	1.00	1.89	0.98	0.12	0.98
Student overall						
No transition	1.92	0.86	2.06	0.89	0.13	0.82
Transition	1.82	0.81	1.96	0.84	0.13	0.96

## DISCUSSION

The main objective of this study was to investigate possible changes in children's achievement after their entry into grade seven. In particular, we examined whether children who moved from an elementary to a junior high school would experience decreases in academic achievement that were greater than those who remained in the same school for seventh grade.

### *Transition Status*

Contrary to our hypothesis, school transition did not impact academic achievement. This finding held, regardless of whether achievement was assessed by teachers, parents, or student self-report. Few Canadian studies have compared declines in achievement for students who remain in elementary schools versus those who move to a junior high school for grade seven. However, the research that exists (Alspaugh, 1998; Simmons & Blyth, 1987; Wigfield & Eccles, 1994) and theory supporting this research (e.g. Eccles et al., 1993) contradict our findings.

The transition to grade seven may not be as detrimental for students in Canadian schools as it is for those in the U.S. Although evidence for this assertion is limited, one recent Canadian study (Cantin & Boivin, 2004) found that students actually received increased peer support following the transition to junior high school. As well, Lipps (2005), using an earlier cycle of the NLSCY, found that Canadian students' academic and psychological adjustment was not affected differentially by attendance of either an elementary or junior high school. Because he used standardized mathematics tests, Lipps suggests that this factor might have limited his results and that using teacher-assigned grades might contribute to findings more similar to those of U.S. studies. This result did not bear out in the current research and, consequently, it is becoming more apparent that Canadian students may not experience the same declines as those in the U.S. when moving from an elementary school.

The assumption that transitioning to a new school is an inherently difficult and stressful time has permeated the policy and practices of Canadian and American schools for some time. Middle school reform, guided by a call for a distinct educational philosophy to support the

education of young adolescents, began in the early 1970s (Heller, Calderon, & Medrich, 2003). This perspective is in evidence today in the many programs, put in place at both elementary and junior high levels, that have focused on preparing students for the many changes associated with the change in school environments. These include visits to junior high schools in the year preceding the transition, meetings with school counsellors to plan programs of study, and parent information sessions and guides (Alberta Government, 2004; Hollycrest Middle School, n.d.; Medicine Hat Catholic Separate Regional Division, n.d.; St. Thomas Aquinas Middle School, n.d.). As well, many junior high school educators in Canada believe that they offer an environment that addresses the “intellectual, social, emotional, moral and physical development needs of young adolescents” (Cowichan Valley School Board, 2005, p. 1). Our results certainly lend support to the claim that a junior high school environment may be able to support academic achievement at the same level as in elementary schools. Furthermore, the focus of Canadian educators on developing programs to actively support students throughout this transition may have resulted in the successful adjustment of students in grade seven.

#### *Overall Sample*

For the overall sample (students who transitioned and those who did not), student self-reports of school performance appear to be less favourable in grade seven compared to grade five. These results are interpreted cautiously because the effect size is small. Numerous studies support declining academic self-concept over the transition to junior high school and as students enter adolescence. This decline has been documented by both U.S. and Canadian studies (Cantin & Boivin, 2004; Wigfield et al., 1991). However, because we found no differences in the self-concept of students who either stayed in elementary school or moved to junior high school, Eccles’ (Eccles et al., 1993) theory of stage-environment cannot fully explain this change. It appears more likely that as students enter adolescence, they become more aware of criticism from parents and teachers and more self-evaluative and, thus, report lower ratings of academic achievement. In addition, the feedback that students receive from parents and teachers as well as their own personal appraisal

may become more critical as postsecondary expectations become more salient.

Both teachers and parents reported that student achievement declined significantly in mathematics from grade five to grade seven, regardless of transition. Although this finding showed a low effect size, it is supported by standardized mathematics test data from the Third International Mathematics and Science Study (TIMSS) (Beaton et al., 1996; Mullis et al., 1997; Mullis et al., 1998). Student test scores decline significantly from grade four to grade seven, before returning to previous levels by grade eight. Student transition to junior high school is often presented as an explanation for this pattern of change; however, our results do not support this assertion. As well, the fact that our findings, using teacher reported achievement, converge with standardized scores obtained from the TIMSS and suggests that changes in student mathematics achievement cannot solely be attributed to teachers' increased expectations.

The TIMSS also reveals that although students in Canada and the U.S.A. experience similar patterns of changes in mathematics achievement, Canadian students make greater gains over time and the drop in scores from elementary to junior high school is not as pronounced for Canadian students as for American students. Certainly the major declines by American students as they move to junior high schools may contribute to their lower mathematics scores in grades seven (Beaton et al., 1996; Mullis et al., 1997; Mullis et al., 1998).

Drawing on Eccles' stage-environment fit theory (Eccles et al., 1993), researchers can explain declines in mathematics achievement due to the decreased motivation observed on the part of Canadian students. Neither the K-8 setting nor the junior high school setting may appropriately match the developmental stage through which adolescents are progressing. However, it appears more likely that the dramatic biological, cognitive, and psychological changes associated with puberty contribute to difficulties in adjustment for some students (Arnett, 1999; Eccles, Templeton, Barber & Stone, 2003). Our results indicate that although most students transition well to grade seven in terms of their overall and reading achievement, actually increasing performance in the latter, a significant number struggle with mathematics. The finding that



mathematics achievement of students in Canada and the U.S. follows such similar patterns (Beaton et al., 1996; Mullis et al., 1997; Mullis et al., 1998) further suggests that declines may be part of the *storm and stress* (Arnett, 1999) of adolescence. The impact of this stage on mathematics has not been shown in previous research. Future investigation of change in performance in various subject areas across grades will be instrumental in detangling the various aspects of the transition to grade seven of Canadian students.

The results of this study should be considered in light of several limitations. First, the sample was drawn from a national database that combines various provinces, rural and urban settings, and school systems. The experiences of grade-seven students in K-7 schools in British Columbia, for example, may be different from those in K-8 schools in Manitoba. The current sample selected from the NLSCY was not large enough to allow for an examination of provincial effects. Nonetheless, if transition has a strong negative impact on achievement, a difference should have been detectable given the large sample size. Second, due to the nature of the NLSCY, we compared students' achievement between grade five and grade seven. Other researchers have typically looked at grades six and seven, and it is possible that differences may be more apparent in these grades. Furthermore, the teacher ratings of achievement that we used as a proxy for school grades were given on a five point scale that may not realistically represent the students functioning in each area. Further, Canadian research may be improved by the use of grades and possibly Provincial Achievement Tests or other more robust measures of academic performance. Finally, it is possible that teachers completed achievement measures toward the end of the school year. The negative effects of school change may be evident only immediately following the transition.

In summary, this study provides an indication that research and theory supporting the negative effects of junior high school transition on students in the U.S. may not accurately describe the experiences of Canadian students. Our findings suggest, rather, that the academic achievement of Canadian students remains stable from elementary to junior high school. Declines observed in mathematics achievement for

the overall sample suggest that the efforts of educators and parents may be best focused on intervention for all students entering grade seven.

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