

# **THE EFFECTS OF CHANGES IN THE PERCEIVED CLASSROOM SOCIAL CULTURE ON MOTIVATION IN MATHEMATICS ACROSS TRANSITIONS**

Athanasidou C. and Philippou G. N.

Department of Education, University of Cyprus

*This study investigates the effects of changes in the perceived classroom social environment on students' motivation in mathematics across the transition from primary to secondary school and during the transition from one grade level to the next within the same school (elementary or secondary school). The comparisons of students who perceived an increase, decrease or no change in the classroom social environment across the transition to middle school indicated that students' who reported a decline in their classroom social dimensions also reported a decline in social aspects of motivation and an incline in negative self-esteem. Furthermore, the effect of the changes in the classroom social dimensions on motivation were found to be larger across the transition to middle school than across the transition within elementary school, whereas they were mirrored in the secondary school transition.*

## **BACKGROUND AND AIMS OF STUDY**

The period surrounding the transition from primary to secondary school has been found to result in a decline in students' motivation in mathematics (e.g. Athanasidou & Philippou, 2007, MacCallum, 1997). This decline was found to be related to certain dimensions of the school and classroom culture (e.g. Eccles et al., 1993, Urdañ & Midgley, 2003). It has been suggested that the two types of schools are very different organizations with respect to "ethos" as well as to practices and that this discrepancy influences students' motivation and performance. Most children move from a relatively small, more personalized and task-focused elementary school to a larger, more impersonal and performance-oriented middle school where they face differences in grading and teaching practices and expectations (Midgley et al, 1995).

The focus of the above studies has been on the academic aspect of motivation and of the school environment. However, students' social perceptions and goals were found to influence their motivation within a new school setting and thus are a significant part of motivation. The importance of attending to the social aspects of students' transition experiences in order to gain a fuller understanding of young adolescents' motivation in school was reinforced by the study of Anderman & Anderman (1999), in which students' social perceptions made significant, unique contributions to their achievement goal orientations. Furthermore, many longitudinal studies documented that the discontinuity in the social environment students' face across the transition to secondary school has an effect on motivation in mathematics (e.g. Eccles et al., 1993). Social discontinuities include changes in the diversity of the student population, relations with teachers and classmates and sense of school belonging.

In these studies middle school classrooms were characterized by less positive teacher-student relationships than elementary school classrooms (Midgley et al., 1995). The study of Eccles et al. (1993), revealed that the students who moved from the mathematics classroom of a high-support teacher (with respect to fairness and friendliness) to a classroom of a low-support teacher showed a decrease in their ratings of the intrinsic value and the perceived usefulness and importance of mathematics, whereas students who experienced a change from low-to-high-support teacher showed an increase in their ratings of intrinsic value. Furthermore, Anderman & Anderman (1999) found that the feeling of belonging in one's school and the endorsement of social responsibility goals were associated with an increased focus on academic tasks and predicted an increased task goal orientation, whereas endorsement of social goals for forming peer relationships and maintaining social status were associated with an increased focus on the self and predicted an increased ability goal orientation.

All the above longitudinal research shed some light on the nature of motivational change and the influence that social classroom and school environmental factors have on this process during the transition from primary to secondary school. These studies however examined motivational change for students as a whole group assuming and inferring that the transition affects all students the same way. This is not necessarily the case; recent research in the area of students' perceptions of their classroom environments supports the view that students perceive the same environment in variable ways at least on some of its dimensions (Urduan & Midgley, 2003). If there are differences in students' perceptions of their classroom environment across the transition which should really be expected, then it is possible that students perceive the transition differentially.

Despite the above theoretical considerations we are aware of only one study, by Urduan & Midgley (2003), which examined the effect of moving from a classroom perceived to emphasize a mastery goal in elementary school to a performance goal structure in secondary school (i.e. that the purpose of engaging in academic work is to develop competence or to demonstrate competence respectively). These researchers compared students who perceived an increase, decrease and no change in the mastery and performance goal structures of their classrooms during the transition to middle school and across two grades within middle school. The results of their study indicated that changes in the mastery goal structure were more strongly related to changes in cognition, affect and performance than were changes in the performance goal structure, whereas the most negative pattern of change was associated with a perceived decrease in the mastery goal structure of classrooms across the transition to middle school.

The aim of the present research is twofold. Firstly, to examine the effects of changes in the perceived classroom social environment on students' motivation in mathematics across the transition from primary to secondary school (grade 6 to 7). To

this end the classroom social environment was operationalized focusing on three dimensions: (a) teacher fairness and friendliness (**FAI/FRI**), (b) cooperation and interaction (**COOP/INTE**), and (c) competition (**COMPET**), whereas students' motivation was conceptualized involving social cognitive (orientations and goals) and affective dimensions (self-esteem). Secondly, to investigate whether the changes observed in students' perceptions of classroom social environment and the related motivation across the transition to middle school are mirrored across the transition from one grade level to the next within the same school context. More specifically, the research questions are formulated as follows:

- (1) What are the effects of the direction of change in the perceived classroom social environment on students' motivation in mathematics across the transition from primary to secondary school?
- (2) Are the changes observed in students' perceptions of the classroom social environment and the related changes in motivation across the transition from primary to secondary school mirrored across the transition from grade 5 to 6 in elementary school and across grade 7 to 8 in secondary school?

## **METHOD**

Participants in this study were 331 students who were followed over a period of two consecutive school years. The students were divided in three Cohorts. The 220 students in Cohort T (CT) experienced the transition from primary to secondary school (grade 6 to 7); the 42 students in Cohort E (CE) were followed over the last two years of elementary school (grade 5 to 6), and the 69 students in Cohort S (CS) were followed over the first two years in secondary school (grade 7 to 8).

Data were collected through a self-report questionnaire in the spring semester of each school year, since by that time of the year students' motivation and their perceptions of the classroom social environment are well developed and established. The questionnaire was comprised of 42 items measuring four dimensions referring to students': (a) social motivational goals (students' social reasons for engaging in math work with 14 items tapping three specific motivational goals such as competition/social power, social concern and affiliation e.g. for affiliation "In mathematics I try to work with friends as much as possible"); (b) social motivational goal orientation (4 items tapping students' perceptions of how socially oriented they are e.g. "I am most motivated when I am showing concern for others in mathematics"); (c) self-esteem in mathematics (students' perceptions of their competence in doing mathematics with 8 items tapping two dimensions such as positive and negative self-esteem e.g. for negative self-esteem "I often make mistakes in mathematics"); and (d) classroom social dimensions (16 items measuring three dimensions referring to teacher fairness/friendliness, cooperation/interaction and competition e.g. for cooperation/interaction "We get to work with each other in small groups when we do math"). The items referring to the first three dimensions were

adapted from the Inventory of School Motivation Questionnaire (McInerney, Yeung & McInerney, 2000), whereas the items for the latter were adapted from the Student Classroom Environment Measure (Eccles et al., 1993). All statements were presented at a five-point Likert-type format (1=Strongly Disagree, 5=Strongly Agree). The reliability estimates were found to be quite high for all the scales ranging from  $\alpha=.69$  to  $\alpha=.88$ .

Data processing was carried out using the SPSS software. The statistical procedure used in this study was Repeated Measures ANCOVA. Change group (CG-3 levels) was the independent, between-groups factor and time of measurement (TM-2 levels) was the within-groups repeated measures component. For all the analyses, gender was included as a covariate to control for any differences by gender.

In order to provide answers to the two research questions, three groups of students for each of the classroom environment variables were created. To create the three groups, students' classroom environment scores were firstly standardized. Next, the change score was calculated by subtracting students' scores on the first measurement from the respective scores on the second measurement, in each classroom dimension. The change scores for each dimension were then divided into three groups: (i) increase; (ii) no change; and (iii) decrease in classroom environment variable. The groups were created by using .50 standard deviations as the cut-off such that students in the "increase" groups scored at least half a standard deviation above the mean change score, those in the "decrease" groups scored at least half a standard deviation below the average change score, and those in the "no change" groups were within .50 standard deviations either above or below the mean change score. Half standard deviation was selected as the cut-off point to make sure that the groups created would be different from one another and yet maintain a large number of participants in order to allow comparisons across groups.

## RESULTS

To answer the first research question, CT students' responses were analysed using Repeated Measures ANCOVAs. Table 1 presents the means, standard deviations and the F ratios for the Change Group x Time of Measurement interactions (CG x TM) for each of the three social dimensions change groups on each of the dependent variables. The alphabetical superscript "a" within each classroom social dimension change group indicates that the means in grades 6 and 7 are significantly different from one another. Similar numeric superscripts indicate non significant differences between group means on variables measured in 7<sup>th</sup> grade using univariate post hoc tests. The .05 level of significance was adopted for these comparisons.

The analyses indicated that the CG x TM effect was significant for social goal orientation, social concern and affiliation goals and negative self esteem for the **FAI/FRI** and the **COOP/INTE** change groups. Examining the results from the 6<sup>th</sup> to 7<sup>th</sup> grade transition, it appears that the most negative pattern of change in motivation

was associated with a perceived decline in **FAI/FRI** and **COOP/INTE** classroom social dimensions. Specifically, the tests of simple effects within groups indicated that students' social goal orientation, social concern and affiliation goals were significantly lower in 7<sup>th</sup> grade than in 6<sup>th</sup> grade within the group that perceived a decrease in **FAI/FRI** and in **COOP/INTE** across the transition to middle school. No significant differences were found between the 6<sup>th</sup> and 7<sup>th</sup> grade means for either the perceived "no change" or "increase" groups. The opposite pattern was observed for negative self-esteem, i.e., students' mean ratings were significantly higher in 7<sup>th</sup> grade than in 6<sup>th</sup> grade within the group that perceived a decrease in **FAI/FRI** and in **COOP/INTE** across the transition. The univariate post hoc tests of 7<sup>th</sup> grade means revealed that the mean ratings of students in the **FAI/FRI** and in the **COOP/INTE** "decrease" change groups on social goal orientation, social concern and affiliation goals were significantly lower than the mean ratings of students in the "no change" or "increase" groups, whereas their negative self-esteem was significantly higher. Also, the analysis of TM effect revealed a significant decline from 6<sup>th</sup> to 7<sup>th</sup> grade in social goal orientation ( $F=3.341$ ,  $p<0.05$ ), social concern ( $F=8.656$ ,  $p<0.01$ ) and affiliation goals ( $F=2.946$ ,  $p<0.05$ ) and a significant incline in negative self-esteem ( $F=3.038$ ,  $p<0.05$ ). Since no statistically significant differences were found between the means of students in the **FAI/FRI** and in the **COOP/INTE** "no change" or "increase" groups from primary to secondary school for social orientation, goals and negative self-esteem, these declines in orientation and goals and the incline in negative self-esteem were not evident for students who perceived no change or an increase in both the above classroom social dimensions.

The ANCOVA analyses for **COMPET** change groups indicated that the CG x TM effect was significant for social goal orientation, competition/social power, social concern and affiliation goals and negative self-esteem. The largest differences were associated with a perceived incline in **COMPET** classroom social dimension. Specifically, the tests of simple effects within groups indicated that students' social goal orientation, social concern and affiliation goals were significantly lower in 7<sup>th</sup> grade than in 6<sup>th</sup> grade within the group that perceived an increase in **COMPET** classroom environment across the transition from primary to secondary school. In both the perceived "no change" and "decrease" groups there weren't any significant differences between the 6<sup>th</sup> and 7<sup>th</sup> grade means. For competition/social power goal and negative self-esteem the opposite pattern was observed since students' mean ratings were significantly higher in 7<sup>th</sup> grade than in 6<sup>th</sup> grade within the group that perceived an incline in **COMPET** environment across the transition. The univariate post hoc analyses of 7<sup>th</sup> grade means revealed that the mean ratings of students in the **COMPET** "increase" change group on social goal orientation, social concern and affiliation goals were significantly lower than the mean ratings of students in the "no change" or "decrease" groups, whereas their competition/social power goal and negative self-esteem were significantly higher. Also, the analysis of TM effect revealed a significant decline in social goal orientation ( $F=3.427$ ,  $p<0.05$ ), social

concern ( $F=9.507$ ,  $p<0.01$ ) and affiliation goals ( $F=3.105$ ,  $p<0.05$ ) from 6<sup>th</sup> to 7<sup>th</sup> grade and a significant incline in competition/social power goal ( $F=9.144$ ,  $p<0.01$ ) and negative self-esteem ( $F=3.247$ ,  $p<0.05$ ). Since there were no statistically significant differences between the means of students in the **COMPET** “no change” or “decrease” groups from primary to secondary school for social orientation, competition/social power, social concern and affiliation goals and negative self-esteem, these declines in orientation and goals and the incline in competition/social power goal and negative self-esteem were not evident for students who perceived no change or a decrease in the **COMPET** classroom social environment.

Dependent Variables	Teacher fairness and friendliness change groups (FAI/FRI)						F Interaction: CG by TM
	Decrease (N = 62)		No change (N = 89)		Increase (N = 69)		
	6 <sup>th</sup> grade	7 <sup>th</sup> grade	6 <sup>th</sup> grade	7 <sup>th</sup> grade	6 <sup>th</sup> grade	7 <sup>th</sup> grade	
Social goal orientation	3.23 <sup>a</sup> (.81)	2.60 <sup>1</sup> (.93)	3.09 (.97)	2.90 <sup>2</sup> (.95)	3.14 (.84)	2.99 <sup>2</sup> (1.03)	4.873***
Compet/social power	2.03 (.95)	2.47 (1.14)	2.24 (1.00)	2.72 (1.12)	2.25 (.89)	2.46 (1.12)	ns
Social concern goal	3.91 <sup>a</sup> (.87)	3.30 <sup>1</sup> (.89)	3.95 (.91)	3.79 <sup>2</sup> (.99)	3.90 (.93)	3.72 <sup>2</sup> (1.10)	3.987***
Affiliation goal	3.17 <sup>a</sup> (.89)	2.73 <sup>1</sup> (1.05)	3.40 (.96)	3.27 <sup>2</sup> (.95)	3.32 (.93)	3.11 <sup>2</sup> (.91)	4.268***
Positive self-esteem	3.70 (.75)	3.06 (1.07)	3.81 (.69)	3.42 (1.10)	3.79 (.74)	3.21 (1.19)	ns
Negative self-esteem	3.21 <sup>a</sup> (.88)	3.97 <sup>1</sup> (.86)	3.27 (.86)	3.49 <sup>2</sup> (.91)	3.39 (.77)	3.48 <sup>2</sup> (.88)	5.488***
Dependent Variables	Classroom cooperation and interaction change groups (COOP/INTE)						F Interaction: CG by TM
	Decrease (N = 78)		No change (N = 63)		Increase (N = 79)		
	6 <sup>th</sup> grade	7 <sup>th</sup> grade	6 <sup>th</sup> grade	7 <sup>th</sup> grade	6 <sup>th</sup> grade	7 <sup>th</sup> grade	
Social goal orientation	3.27 <sup>a</sup> (.81)	2.56 <sup>1</sup> (.84)	3.23 (.80)	2.98 <sup>2</sup> (1.00)	2.96 (.99)	3.03 <sup>2</sup> (1.05)	6.581*
Compet/social power	1.95 (.84)	2.43 (1.15)	2.24 (.95)	2.46 (.97)	2.37 (1.02)	2.79 (1.20)	ns
Social concern goal	4.02 <sup>a</sup> (.88)	3.33 <sup>1</sup> (.97)	4.05 (.73)	3.83 <sup>2</sup> (1.00)	3.73 (1.01)	3.73 <sup>2</sup> (1.01)	5.912**
Affiliation goal	3.37 <sup>a</sup> (.98)	2.86 <sup>1</sup> (.99)	3.35 (.83)	3.18 <sup>2</sup> (.89)	3.22 (.95)	3.19 <sup>2</sup> (.99)	4.259***
Positive self-esteem	3.75 (.76)	3.07 (1.15)	3.80 (.73)	3.18 (1.07)	3.77 (.69)	3.49 (1.12)	ns
Negative self-esteem	3.30 <sup>a</sup> (.86)	3.92 <sup>1</sup> (.95)	3.32 (.72)	3.51 <sup>2</sup> (.82)	3.26 (.90)	3.42 <sup>2</sup> (.88)	5.018**
Dependent Variables	Classroom competition change groups (COMPET)						F Interaction: CG by TM
	Decrease (N = 76)		No change (N = 64)		Increase (N = 80)		
	6 <sup>th</sup> grade	7 <sup>th</sup> grade	6 <sup>th</sup> grade	7 <sup>th</sup> grade	6 <sup>th</sup> grade	7 <sup>th</sup> grade	
Social goal orientation	3.24 (.80)	3.08 <sup>1</sup> (.96)	3.09 (.92)	2.92 <sup>1</sup> (.91)	3.11 <sup>a</sup> (.93)	2.59 <sup>2</sup> (1.03)	4.785***
Compet/social power	2.35 (1.06)	2.48 <sup>1</sup> (1.16)	2.22 (.97)	2.40 <sup>1</sup> (1.12)	2.00 <sup>a</sup> (.79)	2.79 <sup>2</sup> (1.08)	4.955***
Social concern goal	3.88 (.94)	3.72 <sup>1</sup> (.95)	3.92 (.88)	3.74 <sup>1</sup> (.89)	3.97 <sup>a</sup> (.88)	3.42 <sup>2</sup> (1.10)	3.877***
Affiliation goal	3.40 (1.00)	3.36 <sup>1</sup> (1.04)	3.24 (.87)	3.17 <sup>1</sup> (.88)	3.29 <sup>a</sup> (.91)	2.71 <sup>2</sup> (.95)	3.744***
Positive self-esteem	3.91 (.70)	3.21 (1.07)	3.71 (.65)	3.25 (1.10)	3.69 (.78)	3.30 (1.21)	ns
Negative self-esteem	3.39 (.89)	3.55 <sup>1</sup> (.90)	3.21 (.75)	3.41 <sup>1</sup> (.87)	3.27 <sup>a</sup> (.86)	3.85 <sup>2</sup> (.89)	4.057***

**Table 1: Means, Standard Deviations and Summary of Repeated Measures ANCOVAs on motivational variables by changes in classroom social dimensions**

\* $p<0.001$     \*\* $p<0.01$     \*\*\* $p<0.05$

To answer the second research question, the same set of analyses were conducted as students moved from 5<sup>th</sup> to 6<sup>th</sup> grade in elementary school (CE) and from 7<sup>th</sup> to 8<sup>th</sup> grade in secondary school (CS). Table 2 presents the means and the F interaction (CG x TM) for all the classroom social dimension change groups for students in CE and CS. Standard deviations are not presented due to space limits.

Regarding the comparability of results involving the direction of changes in classroom social dimensions between the elementary to secondary school transition (grade 6 to 7) and the elementary school transition (grade 5 to 6), the patterns of results involving all the classroom social dimensions change groups across the

transition from primary to secondary school were not replicated during the elementary school transition. There were no significant interactions for **COMPET** change groups, whereas for **FAI/FRI** and **COOP/INTE** only one significant interaction was observed involving social goal orientation with students' perceptions across the transition within elementary school changing the same way as the perceptions of students across the transition from primary to secondary school.

	Teacher fairness/friendliness (FAI/FRI)				Cooperation/interaction(COOP/INTE)				Competition (COMPET)			
	CE		CS		CE		CS		CE		CS	
	5th	6th	7th	8th	5th	6th	7th	8th	5th	6th	7th	8th
<b>Social orientation</b>												
Decrease	3.44 <sup>a</sup>	3.12 <sup>1</sup>	3.36 <sup>a</sup>	2.62 <sup>1</sup>	3.47 <sup>a</sup>	3.02 <sup>1</sup>	3.50 <sup>a</sup>	2.57 <sup>1</sup>	3.33	3.37	3.39	3.25 <sup>1</sup>
No change	3.75	3.60 <sup>2</sup>	3.12	2.95 <sup>2</sup>	3.37	3.48 <sup>2</sup>	3.25	3.17 <sup>2</sup>	3.40	3.36	3.14	3.08 <sup>1</sup>
Increase	3.31	3.57 <sup>2</sup>	3.12 <sup>a</sup>	3.43 <sup>3</sup>	3.62	3.71 <sup>2</sup>	2.85 <sup>a</sup>	3.09 <sup>2</sup>	3.66	3.55	2.96 <sup>a</sup>	2.57 <sup>2</sup>
F Interaction: CG by TM	3.181***		6.145**		3.560***		5.562**		ns		2.991***	
<b>Compet/social power goal</b>												
Decrease	2.15	2.17	2.63	2.27	2.43	2.25	2.73	2.51	2.20	2.23	2.63 <sup>a</sup>	2.24 <sup>1</sup>
No change	2.16	2.19	2.65	2.56	2.06	2.07	2.58	2.39	2.28	2.07	2.59	2.44 <sup>1</sup>
Increase	2.17	2.13	2.65	2.72	2.05	2.20	2.66	2.77	2.05	2.16	2.73 <sup>a</sup>	3.04 <sup>2</sup>
F Interaction: CG by TM	ns		ns		ns		ns		ns		4.777***	
<b>Social concern goal</b>												
Decrease	3.86	3.71	4.00 <sup>a</sup>	3.66 <sup>1</sup>	3.18	2.89	3.59 <sup>a</sup>	3.05 <sup>1</sup>	3.66	3.30	4.01	3.89 <sup>1</sup>
No change	3.80	3.50	3.71	3.62 <sup>1</sup>	3.96	3.90	3.94	3.80 <sup>2</sup>	3.79	3.93	3.73	3.77 <sup>1</sup>
Increase	3.78	3.75	3.72	3.73 <sup>1</sup>	4.17	4.03	3.71 <sup>a</sup>	3.94 <sup>2</sup>	3.95	3.77	3.55 <sup>a</sup>	3.19 <sup>2</sup>
F Interaction: CG by TM	ns		2.998***		ns		3.840***		ns		3.241***	
<b>Affiliation goal</b>												
Decrease	3.38	3.05	3.68 <sup>a</sup>	3.27 <sup>1</sup>	3.41	2.89	3.46 <sup>a</sup>	2.71 <sup>1</sup>	3.26	3.25	3.29	3.05 <sup>1</sup>
No change	3.61	3.26	3.12	2.92 <sup>2</sup>	3.18	2.87	3.39	3.28 <sup>2</sup>	3.29	2.88	3.11	3.16 <sup>1</sup>
Increase	3.00	2.70	2.75	2.89 <sup>2</sup>	3.35	3.19	2.57 <sup>a</sup>	2.80 <sup>1</sup>	3.35	2.83	3.03 <sup>a</sup>	2.73 <sup>2</sup>
F Interaction: CG by TM	ns		3.125***		ns		4.553***		ns		3.310***	
<b>Positive self-esteem</b>												
Decrease	4.01	3.97	3.34	3.23	3.31	3.49	3.34	3.21	3.51	3.44	3.47	3.27
No change	3.73	3.67	3.48	3.32	4.12	3.91	3.51	3.35	4.13	4.15	3.42	3.26
Increase	3.87	3.87	3.73	3.52	4.05	4.08	3.66	3.46	3.98	3.97	3.71	3.59
F Interaction: CG by TM	ns		ns		ns		ns		ns		ns	
<b>Negative self-esteem</b>												
Decrease	3.40	3.42	3.12 <sup>a</sup>	3.60 <sup>1</sup>	3.06	3.16	3.59 <sup>a</sup>	3.88 <sup>1</sup>	2.94	3.00	3.30	3.20 <sup>1</sup>
No change	3.34	3.36	3.29	3.16 <sup>2</sup>	3.43	3.42	3.09	3.08 <sup>2</sup>	3.72	3.76	3.26	3.19 <sup>1</sup>
Increase	3.01	3.01	3.41	3.34 <sup>2</sup>	3.16	3.16	3.33	3.23 <sup>2</sup>	3.16	3.14	3.27 <sup>a</sup>	3.63 <sup>2</sup>
F Interaction: CG by TM	ns		3.565***		ns		3.243***		ns		2.987***	

**Table 2: Means and Summary of Repeated Measures ANCOVAs on motivational variables by changes in classroom social dimensions for students in CE and CS**

**\*p<0.001    \*\*p<0.01    \*\*\*p<0.05**

On the contrary, the patterns of changes in classroom social dimensions change groups for students across the transition from primary to secondary school were mirrored for students across the transition within secondary school, with some notable exceptions. Firstly, social goal orientation increased significantly from 7<sup>th</sup> to 8<sup>th</sup> grade among those students who perceived an increase in **FAI/FRI** and **COOP/INTE** classroom social environment but decreased significantly for those students who perceived a decrease in **FAI/FRI** and **COOP/INTE** social environment over time. A similar pattern was observed for the analysis regarding social concern and affiliation goals as the dependent variable for the **COOP/INTE** social dimension. In addition, the comparison of the differences found across the transition to secondary school (6<sup>th</sup> to 7<sup>th</sup> grade) with those found during middle school (7<sup>th</sup> to 8<sup>th</sup> grade) among the **COMPET** social dimension change groups revealed similar directions of change for social orientation, social concern and affiliation goals and negative self-esteem. However, a significant difference over time was found for the competition/social power goal. The students who moved from 6<sup>th</sup> to 7<sup>th</sup> grade and perceived an increase in the **COMPET** social dimension of their classroom reported endorsing competition/social power goals significantly more, whereas students in the no change or decrease groups did not change significantly in their adoption of competition/social power goal. But when students moved from 7<sup>th</sup> to 8<sup>th</sup> grade, the endorsement of competition/social power goal decreased significantly among those students who perceived a decrease in the **COMPET** social environment over time.

## DISCUSSION

The results of the study suggest that when students make the transition to middle level schools they are likely to move into classrooms that are characterized by less teacher-student relations, less cooperation and interaction whereas competitiveness is emphasized. Despite those general trends, there are students who perceive no difference in their classroom social environment before and after the transition and other students who perceive an increase in their classroom social orientation. Recent studies have contributed to our understanding of what occurs within classrooms, but nothing is known about the effects of moving from one classroom social environment to another. Thus, while it has been documented that the classroom social environment changes after the transition from primary to secondary school, it remains unclear what effects these differences might have on students' motivation in mathematics. The present study shed some light on these issues.

More specifically, the results of the study revealed that students who reported a decline in their classroom social environment across the transition to middle school also reported a decline in the social aspects of their motivation and an increase in negative self-esteem. Also, it was found that among students who reported an increase in the social environment of their classrooms after the transition, the general negative pattern of change in motivation was not evident. These results suggest that whereas a perceived increase in classroom social dimensions has advantages, the



disadvantages associated with a perceived decrease in the classroom social environment are even stronger. Perhaps social messages in the classroom are more evident to students when they are first removed than when they are perceived to be added. In other words, students may not notice the presence of social dimensions in the classroom as much as they notice their absence. This may be particularly true when students move from what has been described as the more nurturing elementary school environment to the more impersonal middle school classroom environment (Anderman & Anderman, 1999).

The changes in motivation associated with changes in the perceived classroom social dimensions were found to be larger during the transition to middle school than they were during the last two years in primary school. This finding is pretty logical taking into consideration the fact that the classroom environment in elementary school is almost the same across grades. On the contrary, the effect of changes in the perceived classroom social environment and changes in motivation that were found across the transition to middle school were replicated within the first two years of middle school. Therefore, the stress of moving to middle level schools does not enlarge the size of the effects of changes in the perceived classroom social dimensions on motivation, despite the fact that previous research has documented that the transition to middle level school can be a stressful time in students' lives (e.g. Eccles et al., 1993).

Although the size of the changes in motivation associated with changes in the perceived classroom social environment were quite similar across the transition to middle school and within the first two years in middle school, there were some interesting differences in the direction of the changes and in which change groups the largest differences were found. The changes in the means were largest among students in the decrease groups for **FAI/FRI** and **COOP/INTE** dimensions from 6<sup>th</sup> to 7<sup>th</sup> grade. For students in the 7<sup>th</sup> to 8<sup>th</sup> transition the differences within these groups remained whereas differences in the **FAI/FRI** and **COOP/INTE** increase groups were found since students' who perceived an increase in the above social dimensions reported higher social orientation and goals and lower negative self-esteem. It also appears that the pattern of change among the **COMPET** social dimension change groups differed across the two time periods of the study. For example, the **COMPET** increase group reported a decrease in motivation from 6<sup>th</sup> to 7<sup>th</sup> grade, whereas when students made the transition from one grade to the next within middle school the **COMPET** decrease group reported an increase in their motivation.

These shifting patterns of results are evident due to the fact that the transition to middle school influences the salience of the presence or absence of social messages in the classroom (Anderman & Anderman, 1999). When moving from a smaller and perhaps more social oriented elementary school environment to a middle school environment, students may be particularly aware of decreases in the emphasis on social orientations and goals in the classroom, creating stronger effects on motivation among those students who perceive a decrease in the classroom social environment.

Once familiar and comfortable with the middle school environment, however, increases in the classroom social environment become as salient as decreases and the effects of these two types of change become more even.

The findings of the present study highlight the effects of changes in the classroom social environment on students' motivation in mathematics during the transition from one school context to another or from one grade level to the next within the same context. Therefore, longitudinal studies examining these issues can assist in unravelling the complexity of motivational change across transitions. Such studies should examine different aspects of motivation (academic, social and affective) and various dimensions of the classroom or school environment. This multidimensional perspective is very important in order to understand not only the effects of what is more prevalent in classrooms but in determining what the most facilitative environments are, even if they are uncommon, in order to test the effects of these environments on the nature of change in students' motivation in mathematics. Such information will be useful for teachers, educators and policy makers in their planning to make systemic transitions easier so fewer students are lost.

## REFERENCES

- Anderman, L.H., & Anderman, E.M. (1999). Social predictors of changes in students' achievement goal orientations. *Contemporary Educational Psychology*, 25, 21-37.
- Athanasίου, C. & Philippou, G.N. (2007). Students' motivation in mathematics and gender differences in grades 6 and 7. *Proceedings of CERME 5*. Larnaca, Cyprus.
- Eccles, J.S., Wigfield, A., Midgley, C., Reuman, D., MacIver, D., & Feldlaufer, H. (1993). Negative effects of traditional middle schools on students' motivation. *Elementary School Journal*, 93, 553-574.
- MacCallum, J.A. (1997). Motivational change in transition contexts. *Unpublished doctoral dissertation*.
- McInerney, D.M., Yeung, S.Y., & McInerney, V. (2000). The meaning of school motivation: Multidimensional Hierarchical Perspectives. *Paper presented at the Annual Meeting of the American Educational Research Association*. New Orleans, LA.
- Midgley, C., Anderman, E.M., & Hicks, L. (1995). Differences between elementary and middle school teachers and students: A goal theory approach. *Journal of Early Adolescence*, 15, 90-113.
- Urduan. T., & Midgley, C. (2003). Changes in the perceived classroom goal structure and pattern of adaptive learning during early adolescence. *Contemporary Educational Psychology*, 28, 524-551.