

Chapter 5 Discussion

This chapter summarized the results of all of the analyses and discussed the relationships of these findings with the literature. I divided this chapter into two major parts, based on students' performances at different life stages. In the first section, I focused on students' academic performance in junior high schools, describing the influences of students' positions in their school classes and school environments on their performance at schools. In the second section, how their positions in junior high schools and how their junior high school environments affected their high school placements were discussed.

School Effects on Students' Performance

The first purpose of this research was to identify the school effects on individual students, with the special focus on the direct and indirect effects of school structures. Using three-wave panel data from Taiwan Youth Project and Youth Panel Study, I testified how school structure, school contexts and school networks, modified students' outcomes. This question is inherently multilevel, 3-level multilevel cumulative logit models are introduced to answer the research questions.

My first research question is to examine if students' integration into class influence their academic performance, including their academic ranks in junior high schools and their performance in high school enrollments. The research findings were summarized in Table 5.1 .

Table 5.1 Summaries of Findings about Integrations on Performance

Performance	Outdegree	Popularity	Permeability
Entrance Exam Cohort			
Ranks in Junior High	Positive	N.S.	Positive
Probabilities to Enter Public High	N.S.	N.S.	N.S.
Percentile Ranks of High Schools	N.S.	Positive	N.S.
Competency Test Cohort			
Ranks in Junior High	N.S.	Positive	N.S.
Probabilities to Enter Public High	Positive	Positive	Positive
Percentile Ranks of High Schools	Negative	N.S.	N.S.

Note: N.S. indicates non-significant result

From these results, the first should be noted was the influences of permeability. Permeability indicated the ratio of friend number outside class of the total friend number students' nominated. Higher permeability means students' have more connections outside class which implies less integration into school classes. I expected that permeability would lead to worse outcomes for students' academic performance, however, the results were contrary. But one should be noted that not all friends outside class are deviant friends. Besides, in TYP and YPS data, most friends students nominated are students, are met because they studied in the same school class in elementary schools or in junior high schools. Takes the nominations of the third years in junior high schools of student sample from the new system as example, among 7909 nominations, only 0.4% friends were not students. 79.18% friends are classmates in kindergarten, elementary schools or junior high schools and 14.40% friends are met in schools or in cram schools. Since most of these friends are students, are classmates, they should have the same academic objectives to enter higher education systems. As a result, these friends can serve as resources when students need someone to discuss their academic assignments or as companies to study together. Crosnoe, Cavanagh, and Elder(2003) indicated that adolescent friendships

serve as social capital, although the value of which is context-specific. Friends can serve as potential protective role to prevent students from academic problems. From these discussions, permeability may not be a good indicator of integrations, since its' meaning is not only connections out side class but also resources when they are in need.

Second, for students from the new system cohort, outdegree increased the probabilities to enter public high school, however, it decreased values of percentile ranks in high school placement, which means for those students who have good grades, friends might not be so resourceful for their academic performance. This implied that the effects of number of friends may interact with students' academic performance or these effects are nor linear. Future work need to be done to have more understanding about friends' influence on students' performance.

Although no evidence has been found in Taiwan about students' social networks and their links to academic performance, Godinez(2005) documented the role of peers in enhancing school achievement and the role of schools in fostering positive interactions. The positive significant parameters of outdegree and popularity support my research hypotheses, suggesting integration into school class did positive influence students' performance. This study recognizes that friends promote adolescent adjustment. Friends can offer resources and opportunities to adolescence that help them to navigate the schooling process, protecting them form disengaging and losing their way(Crosnoe, et al., 2003). As Coleman mentioned in *the Adolescent Society*, the degree adolescent integration into school system was crucial for successful adaptation, the results support this argument, and it influence students' overall adaptations, including academic performance (C.-I. Wu, et al., 2006), self-esteem(Y.-S. Hsieh, et al., 2007; C.-I. Wu, et al., 2006; C.-I. Wu & Lei, 2001), depression(I.-C. Chen, et al., 2007; Y.-T. Huang, 2007; C.-I. Wu & Lei, 2001),

suicidal thoughts (Bearman & Moody, 2004), and weapon carrying (Moody, 2002). In this research, individuals' integration was treated as a time-varying indicator to predict academic growth trajectories, consequently, friends' influences in a dynamic process are documented, implying that simply by structuring spaces and opportunities for students to interact with friends, school teachers can help students successfully adapt their school lives.

Sociological research has often examined the effects of school structure and composition on friendship characteristics (Joyner & Kao, 2000; Moody, 2001; Mouw & Entwisle, 2006) and academic outcomes (V. E. Lee, Smith, & Croninger, 1997; Ortiz, Hoyos, & Lopez, 2004) but has less often examined how school characteristics moderate the linkage between friendship and adolescent behavior (Crosnoe, et al., 2003). Such moderation is at the heart of my second research question: Did school context moderate the effects of students' integration into school class on individuals' academic performance? Hence, the second research question of this study is to see if school contexts directly or indirectly affect students' academic outcome. Two indicators were used as measurements of school contexts, school urbanization and class type. Table 5.2 summarized the findings about school context on students' performance.

As to the influence of urbanization of school area, only indirect effect was found for the entrance exam cohort. Because the lower value of school urbanization indicated higher degree of urbanizations, the negative significant parameter documented that students with more classmates nominated them as friends would benefit more from their friends if they studied in a higher urbanized school area. This was not surprisingly for the additive effects since schools located in a higher urbanized area implied more resource students can access and students who studied in higher urbanized area often came from higher SES families, at least from families

located in a higher urbanized area.

With regard to the effects of class type, the results showed that class type was positively related to high school enrollments, including the probabilities to enter public high school and the percentile ranks of high schools, suggesting higher level of overall students achievement in school classes directly influence students' outcome in high school enrollment. One should be noted that the negative interaction effects of class type and permeability reached a higher level of statistical significance(as shown in Figure 5.1), which means for those students who studied in a high-performing class, friends outside their school class had negative influences, however, for those who didn't enter a high-performing class, friends outside class may serve as a protective function to help students to improve their academic performance. The results had two important meanings. First, for those who studied in a high-performing class, the competitive nature of school class may bring a lot of stress for them, while friends outside school class may be an exit they can escape from academic stress, however, the non-academically oriented function may not help these students to improve their performance. But for those who didn't studied in a high-performing class, the results implied that friendship outside school classes serves as protective function when they are in disadvantaged school classes. Such environments are problematic because students in these environments clearly have less opportunity to build academically oriented friendships, however, friends outside class may give them such opportunity to build their social capital. This argument is support by a series of studies by Crosnoe and his colleagues (Crosnoe, 2004; Crosnoe, et al., 2003; Crosnoe & Elder, 2004).

Table 5.2 Summaries of Findings about School Context on Performance

Performance	Urbanization	Class type
Entrance Exam Cohort		
Initial Ranks in Junior High	N.S.	N.S.
Change Rate of Ranks in Junior High	N.S.	N.S.
Indirect effects	Popularity(-)	N.S.
Probabilities to Enter Public High	N.S.	Positive
Indirect effects		N.S.
Percentile Ranks of High Schools	N.S.	Positive
Indirect effects		Permeability(-)
Competency Test Cohort		
Initial Ranks in Junior High	N.S.	N.S.
Change Rate of Ranks in Junior High	Negative	N.S.
Indirect effects	N.S.	N.S.
Probabilities to Enter Public High	N.S.	Positive
Indirect effects		N.S.
Percentile Ranks of High Schools	Negative	N.S.
Indirect effects		N.S.

Note: N.S. indicates non-significant result

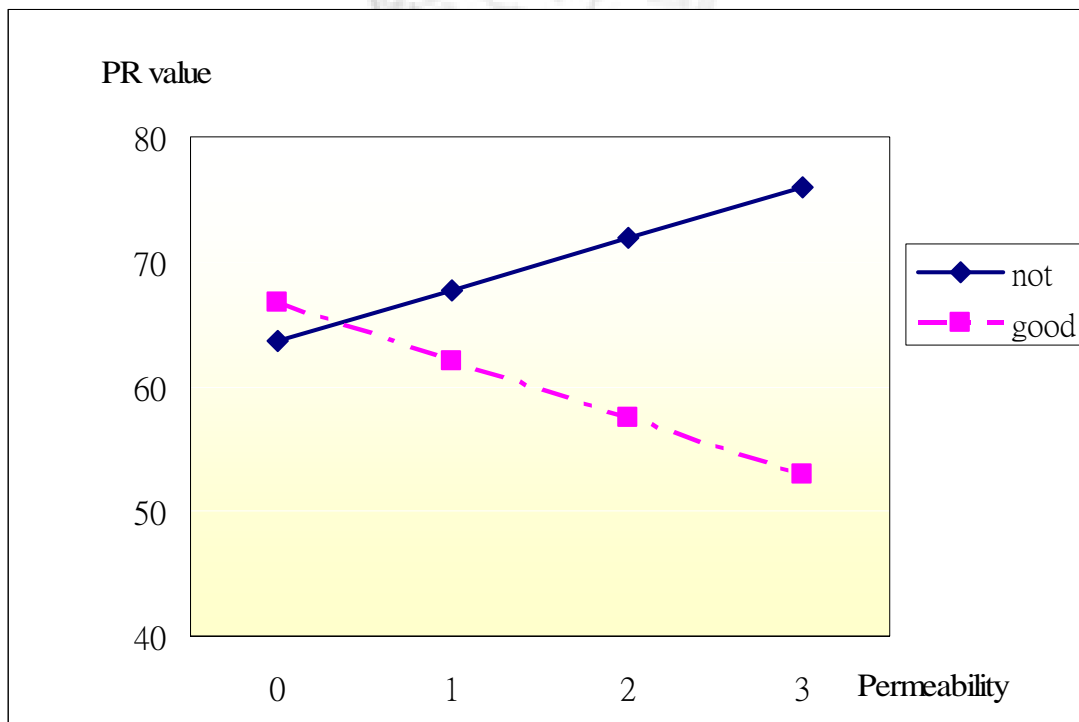


Figure 5.1 The Interaction Effects of Class Type and Permeability on Percentile Ranks

For student cohort from the new system, school urbanization have negative impacts on change rate of academic ranks in junior high and on the values of percentile ranks in high school enrollments, while class type were found to have positive influences on the probabilities to enter public high school. Only direct effects of school contexts were found in these models. When the individual-level counterpart was added, the effect of school context was not reduced, suggesting the strong direct impacts of school structure on individuals' performance. Comparing the results of models of competency test cohort showed that students benefited more from high-SES school.

The third question of this research focused on the effects of the social interactions. Class cohesion as well as school climate were included in the research model. My interests were to explain how global relationship patterns in local settings influence individual's outcome. The results were shown in Table 5.3 .

The structure of social ties affects norm enforcement and social influence more generally (B. Entwisle, et al., 2007). As a result, interconnectedness of social ties within a school class could enhance the quality of information about the education goal in the school class. It is probably also the case that a student himself/herself connected to many other classmates is better shaped by the school norms and education objectives. I also considered this as well. So, in my analyses, all the models included the connections of individual himself/herself. The results indicated, for entrance exam cohort, class cohesion positively influences student's initial ranks and it's change rate in junior high school and positively enhances the probabilities to enter public high school even when I control individual's position in school class. These effects were not reduced after adding the interaction effect with individual-level counterpart.

Table 5.3 Summaries of Findings about School Networks on Performance

Performance	Climate	Cohesion
Entrance Exam Cohort		
Initial Ranks in Junior High	N.S.	Positive
Change Rate of Ranks in Junior High	Positive	Negative
Indirect effects	Popularity(+)	Outdegree(+) Permeability(+)
Probabilities to Enter Public High	N.S.	Positive
Indirect effects		N.S.
Percentile Ranks of High Schools	N.S.	N.S.
Indirect effects		N.S.
Competency Test Cohort		
Initial Ranks in Junior High	N.S.	N.S.
Change Rate of Ranks in Junior High	N.S.	N.S.
Indirect effects	N.S.	Outdegree(-) Permeability(-)
Probabilities to Enter Public High	N.S.	N.S.
Indirect effects		N.S.
Percentile Ranks of High Schools	N.S.	N.S.
Indirect effects		N.S.

Note: N.S. indicates non-significant result

Since junior high school structure could directly affect students' high school outcome, or indirect affect it through modify students' performance in junior high schools, I didn't rule out this probability. So, in high school model, I controlled students' performances in junior high to see how school structure modify students' outcomes. The results indicated that, for students from the old education system, in junior high schools, students' performances are directly or indirectly conditioned by school networks, including class cohesion and school climate. Besides, the direct effects didn't reduce even when the interactions with individual-level counterparts were included, documenting the two type of structural effects in Blau's theory. The significant normative influence and the indirect influences based on opportunity

structure indicated students' lives were conditioned on the social process external to individual characteristics as well as the intra-personal processes.

One may noted the negative effects of class cohesion on the change rate of students' performances in junior high schools. This is because for students studied in a cohesive class, they had a better start on their performance. The higher level of starting value would decrease their growth rate. On the contrary, for those who studied in a less cohesive class, the lower level of performance gave these students more space to improve their performance. But one should note that even the negative influences of cohesion on growth rate, the impacts of cohesion as a whole still had positive influence on students performance, supporting my expectation that the more cohesive a network, the more likely that values can travel through social ties to all members so that the education goal in school is easier to be obtained.

For students' outcome to high school enrollment, only the impacts of class cohesion on the probabilities to enter public high school were documented. However, comparing the results of model 1 and model 2 in Table 4.12 , one might noted that the significant effects of class cohesion on the percentile ranks were reduced when some interaction term were included, showing that the influences of class cohesion on percentile ranks is not directly, but indirectly through change students' performance or students' position to modify their performance in high school entrance exam.

Moreover, it is interesting that the significant variables of individual-level counterpart for class cohesion and school climate are totally different, indicating the mechanisms behind these two effects are somewhat different. This result demonstrates that the value transmission is largely through others' transmit, however, the power of cohesion is largely through individual's desires since popularity is the choices from others, however, outdegree and permeability are the choices by oneself. Further research on these mechanisms is warranted.

For the competency cohort, the story is different. The influence of class cohesion and school climate significantly declines. Among all the outcome variables, only the indirect effects of class cohesion on academic ranks in junior high school were significant, suggesting that the school influences of relational parts gradually decrease. Besides, the negative significant effects indicated that the more friends outside and inside school classes, the higher probabilities for students to have better performance if they studied in a less cohesive class. One possible explanation is that students in a cohesion network could reach many others through direct or indirect ties may have more opportunities to involve in social activities so that their study time decreased. However, one might noted that the effects of class cohesion on students' performance for two cohort students were differently, more comparisons of different cohorts and discussions about the mechanisms of these differences will be obtained in next sections.

In conclusion, in the first part of my research, the results supported Blau's operational model of structural theory, suggesting school structure affects students' outcome. The effects of normative environment were observed, however, individual also has his or her own power to alter the impacts of social structure. That is, under the unchangeable school structure, students still can do something to change the structural influences through their own actions. Moreover, from these discussions, some differences between two student cohorts from different education systems were observed. In next section, further comparisons between two student cohorts will be obtained and the impacts of education reform will be discussed.

The Influences of Education Systems

In Taiwan, education reform was administered in order to mitigate the stress of education competition. At the beginning stage of education reform, the institution reform about the channels to enter high schools is the first and the most important business of the government's educational policy. Among these changes, the shift in examinations is the most significant. Students from the old education system had only one opportunity to take the entrance exam which determines their high school placements. However, for students from new system, they had one more chance to take the exam, the competency test, and not only the scores of the test but also their performance in junior high schools were take into account to their high school enrollments. Does the major change of education system modify the school influences on it's students' outcomes? In this section, my discussions will focus on the different impacts of school on it's students in order to infer how the major change of education system alter students' life experiences. Because the education systems not only conditioned students' life in junior high schools, but also influenced their outcomes to enter high schools, the influences of education systems on the two major outcomes of students at different life stage would be obtained.

Table 4.11 compared the difference of school effects in junior high school years on different student cohorts. Three major findings are summarized as follows:

1. The change rates of ranks in school classes were documented to have cohort difference, which implied students performances were relative not stable for competency test cohort.
2. The negative significant parameter of cohort on the effect of permeability on individual's performance indicated students benefited more from

friends outside school classes if they came from the education system of entrance exam.

3. The significant differences in the effects of class cohesion on the initial ranks as well as on the change rate of students' performances in junior high schools were documented. I then suspect that the school effects are somewhat different after education reform.

Besides the different impacts on students' performances in junior high schools, I also compared the different influences of junior high schools on students' high school placements. The main findings in Table 4.16 are summarized as follows:

1. The influence of students' grades on their high school placements was found to have significant cohort differences, suggesting for students of competency test cohort, their performances in junior high schools were more important than those for those of entrance exam cohort. This is not surprisingly since students' performances were included in the considerations of high school enrollments.
2. Popularity was found to significantly affect students' percentile ranks in high school placements and this effect had significant cohort differences, demonstrating that the influences of friends who nominated the students as friends were declined for the new cohort, although the effect of popularity was still positive.
3. The effect of class cohesion on the probabilities to enter public high school was the same as its influence on students' ranks in junior high schools. The significant cohort differences documented the fact of the decreasing school effects again.

Among these results, one might find that, for new cohort students, the relational part of school effects significantly declined. One possible explanation on

this finding is about the more prevailing cram schooling. Although there are no literatures documented more and more students go to cram schools for their high school admissions after education reform, school teachers did report the increasing rate for junior high school students to enter cram schools. In the open questionnaires in TYP survey, several head teachers reported their observations about the increasing ratio of students going to cram schools after education reform. The increasing number of total cram schools in Taiwan (Y.-J. Huang & Chen, 2008; D.-S. Lin & Chen, 2007; Liu, 2006) is another evident since it reflects the needs of students and their parents. Evidences from Liu (2006) indicated more and more students went to cram schools in order to survive from the Multi-Channel School Admission System. The Multi-Opportunities for School Entrance System allowed schools to admit students through multiple channels. According to students' competency test scores, academic performance, aptitude and non-scholastic talents and skills, such as the records to win a prize for piano playing or basketball playing, students can choose to enter a higher-level school either through schemes of application, recommendation, or through the competency test. No matter academic or non-academic skills and talents, students can learn from cram schools. Even the skills of oral examinations of application or recommendation to enter high schools can be taught in cram schools (Y.-G. Chen, et al., 2006; D.-S. Lin & Chen, 2007). The increasing time students spend on cram schooling relative decreased students' time spend on schools and social activities with their friends. Besides, Chen and Liu (2004) documented high-SES students have higher probabilities to enter public high schools because of cram schooling and cultural capitals. The significant effects of family SES on the inequality of educational opportunities (C.-J. Chen, 2006; J.-J. Chen & Liu, 2004; Y.-G. Chen, et al., 2006; Y.-J. Huang & Chen, 2005a, 2005b; C.-Y. Lin & Huang, 2008b) also support this explanation. Although the positive effects of cram schooling

on students' outcomes to enter higher education were not yet confirmed, the fact of more and more students going to cram schools was not be ignorable.

Moreover, except students' academic performance and competency test scores, their aptitude and non-scholastic talents and skills were taken into account in advancing high schools through the channels of applications and recommendations. All these considerations decreased the relative importance of students' academic performance. Relatively, the influences of schools decreased since the most important function for school education was to help students enter higher education under Credentialism.

Besides, the significant interaction term among variables of individual-level counterpart and cohort implied the decreasing protective functions of friends on students' academic failures. For the academic performance of new cohort students, the decreasing peer effects might also because of the increasing cram schooling. The increasing time for students to go to cram schools relative decreases the time for students to be company with their friends, as a consequent, friends' influences on students' performance decreased.

Although the mechanism still remained unclear, the decline school effects suggests schools gradually lost their functions on modifying students' outcomes. The warning signs should not be ignored by parents, school teachers, educational policy makers and education reformers.