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學校學業脈絡與青少年戀愛關係：

台灣高中生的多層次分析

High School Academic Context and Adolescent Romantic
Relationship: A Multilevel Study of Taiwanese High
School Students

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Romantic Relationship:
A Multilevel Study of Taiwanese High School Students

本論文係陳廷雅君(B08305018)在國立臺灣大學社會學系完成之學士班學生論文，於民國 112 年 3 月 30 日承下列考試委員審查通過及口試及格，特此證明

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謝辭

沒想到在學士班的階段就有機會寫謝辭，我實在是受寵若驚。完成這篇學士論文不會是我鑽研教育社會學或青少年研究的終點，然而卻是一個重大的里程碑。寫作過程中，我體認到所有的學術研究，絕非一人的能力即可達成，各式各樣豐沛的資源與溫暖，是支持我完成這篇研究的動力。我首先必須感謝指導教授蘇國賢。當初帶著極不成熟的題目找老師做大專生，老師不但欣然答應，且一直給我許多建議與指導。更重要的是，若沒有老師的鼓勵與信心，我可能不會踏上追求學術的道路。國賢老師讓我有勇氣一步一步向前，讓我體認到做研究並非遙不可及之事。我還要感謝郭貞蘭老師對這篇研究從假設的討論、統計分析的設計與詮釋，都給了相當寶貴的建議。我也非常感謝劉仲恩老師，在學士論文寫作課上給了我許多反思文章的方向。我也很幸運，能邀請林孟瑢老師、呂青湖老師擔任我的口試委員，老師們針對我的理論方向、統計模型與結果的詮釋與討論都給我許多提點，而這些都將成為我未來更加完善此篇論文的目標。

我也要感謝台灣教育長期追蹤資料庫（Taiwan Education Panel Survey, TEPS）的資料收集與處理團隊。對於量化研究者來說，好的資料絕對是做研究的重要基礎。這份資料不但有龐大的樣本、豐富的指標，更有多層次的資料，對教育社會學的研究十分有幫助。我非常榮幸能使用這筆資料。

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摘要

過去研究討論了戀愛關係發展的脈絡，以及它如何和生命中的其他目標互相影響。文獻指出在東亞，進入戀愛關係與追求學業目標之間有緊張關係。然而，目前學界缺乏對於此緊張關係的深入探討。因此，這篇文章將檢驗學校脈絡對學生戀愛關係的影響。本文使用台灣教育長期追蹤資料庫（TEPS）的資料，搭配多層次的邏輯迴歸分析，檢驗學校層級學業表現，對於學生是否進入戀愛關係的影響，並且估計這個影響，是否因為學生的性別或在校排名而有所差異。結果顯示，就讀整體學業成績平均較高的高中的學生，較不容易進入戀愛。然而，這個關聯性僅能在女性，以及在校排名較高的學生上發現。這篇研究讓我們更了解學校學業脈絡，以及非學業行為之間的關係。並且，目前討論戀愛關係的研究多來自西方，而這篇文章則在戀愛與課業間有緊張關係的東亞脈絡下討論了此主題，補充了非西方文化的觀點。

關鍵字：學校脈絡、戀愛關係、學業表現、多層次分析、TEPS

Abstract

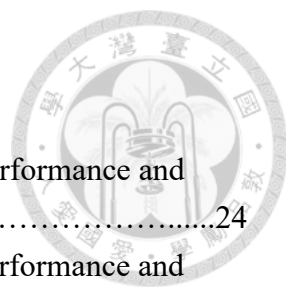
Previous studies have examined the context of romantic relationships and their interplay with other life goals. They have indicated that the tension between academic pursuit and romantic involvement is evident in East Asia. However, few studies have explored the tension. Hence, this study aimed to examine the effect of school context on individuals' romantic involvement. Using data from the Taiwan Education Panel Survey (TEPS), the current research examined the effect of school-level academic performance on individuals and investigated whether the effect varied with individual-level academic performance and gender by multilevel logistic regression models. The results are: (1) students in higher-ranking schools are less likely to be romantically involved (2) the effect of school context is only significant for girls and students with higher ranks within their schools. This study sheds light on the relationship between school academic context and non-academic involvement. In addition, the study views adolescent romantic relationships in the East Asian context, where the tension between academic pursuit and romantic relationships is strong.

Keywords: School Context, Romantic Relationship, Academic Performance, Multilevel Analysis, TEPS

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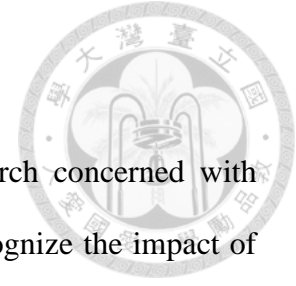
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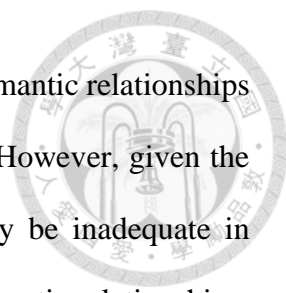




1. Introduction

In recent years, there has been a dramatic proliferation of research concerned with adolescent romantic relationships, as researchers have come to recognize the impact of adolescent romantic relationships on later development, such as academic performance and later marriage (Collins, 2003; Giordano, 2003; Raley, Crissy, & Muller, 2007). Previously, sociologists explored the consequences of romantic involvement. In recent years, researchers have become increasingly interested in the contexts of its formation, including family (Cavanagh, Crissey, & Raley, 2008; Valle & Tillman, 2014) and school (Kao, Joyner, & Ballistreri, 2019). For example, scholars have investigated the relationship between school racial-ethnic composition and interracial dating (Strully, 2014). Previous research has also examined how relationship formation conflicts with other goals, such as career development and education (Allison & Risman, 2017).

The school context can influence students' pursuit of goals, as it affects their educational aspirations, time use, perceived chances of attending selective colleges, and even romantic involvement (Domina, Penner, & Penner, 2017; Lin, 2020; Liu & Huang, 1995; Marsh, Kong, & Hau, 2000; Tyson, Darity, & Castellino, 2005). In Taiwan, romantic involvement is often viewed as conflicting with pursuing academic goals (Li, Huang, & Shen, 2019). Hence, the school context can moderate the tension between academic goals and romantic relationships (Lin, 2020; Liu & Huang, 1995; Su, 2016; TYP, 2003). However, little literature in Taiwan has explored how "school context" affects adolescent romantic relationships. A few studies have compared the prevalence of adolescent romantic relationships and attitudes between high school students and vocational high school students. The results have suggested that high school students think more

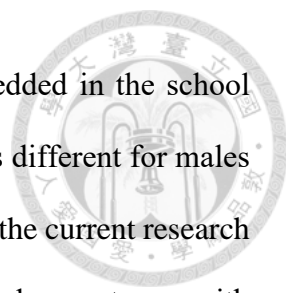


negatively about romantic involvement and are less likely to enter romantic relationships due to greater academic pressure (Lin, 2020; Liu & Huang, 1995). However, given the heterogeneity within both types of schools, such comparisons may be inadequate in providing insight into the impact of school context on adolescent romantic relationships.

Previous scholars have investigated the academic aspect of school context, operationalized as school-average academic performance.¹ Studies have examined how the school academic environment affects one's self-evaluation and aspirations (Marsh, 1984; Marsh, 1991; Marsh, 1993; Marsh et al., 2000). This mechanism is thought to be driven by a social comparison process, such as the "big-fish-little-pond" effect or the "reflected glory" effect (Marsh et al., 2000). In addition, an individual's value of academic success may also be affected by other factors. For example, the teacher-student interaction (Zhan, 2006), the evaluation from college admission staff (Attewell, 2001; Espenshade, Hale, & Chung, 2005), and the importance of "achievement" in determining social status among high school peers (McFarland, Moody, Diehl, Smith, & Thomas, 2014). Taiwan provides a unique context to study the impact of school-average academic performance, given that high school assignment is primarily based on academic achievement. This policy creates a significant disparity in academic achievement levels across different schools while minimizing the variation within each school.

Overall, the school academic context shapes how students value school achievement, and further influences the tension between academic pursuits and romantic relationships. Hence, I propose the following research question: "How does the school's academic

¹ In this study, "school academic context" is operationalized as "school-level academic performance", which is the "school-average academic performance".



context affect students' romantic involvement?" Socialization embedded in the school context and people's perception of students' romantic involvement is different for males and females (Giordano, 2003; Legewie & DiPrete, 2012). Therefore, the current research further asks: "How does the effect of school context on romantic involvement vary with gender?". Finally, students' individual academic performance, as well as school-level academic performance are found to be important predictors of students' self-evaluations (Marsh, 1984). As a result, the study asks the third question: "How does the effect of school context vary with students' rank within their school?"

By using the TEPS, this study examined how school-level academic performance affected students' romantic involvement, and how the effect of school academic context varied with gender and one's rank within their school. Besides providing a better understanding of the relationship between school contexts and romantic involvement, this study also illustrates how the tension between academic pursuits and romantic relationships may be played out in the East Asian context in which credentialism and early selection are emphasized.

2. Literature Review



Romantic involvement can be associated with the school context in Taiwan due to the following two reasons. First, students' school context shapes how they set goals and decide what to prioritize. Second, Taiwanese high school students consider romantic involvement and academic pursuit to be conflicting goals (Lin, 2020). Hence, it is important to investigate how school context affects students' decisions and opportunities to be romantically involved. The current study discusses first the tension between romantic involvement and academic pursuit, and then the possible mechanisms of how the school can affect students' romantic involvement.

2.1. The Tension between Adolescent Romantic Relationships and Academic Pursuit

Adolescent romantic relationships are commonly viewed as distractions from studying and are therefore discouraged by concerned parents and teachers (Li, Huang, & Shen, 2019). According to the survey of the Taiwan Youth Project in 2003, approximately 54% of the respondents reported that their schools forbade dating (TYP, 2003). This phenomenon is likely related to the highly competitive academic atmosphere (Zhao, 2015). The school authority and concerned parents worry that the unstable emotional status during romantic relationships may negatively affect academic performance (Chen, 1986).

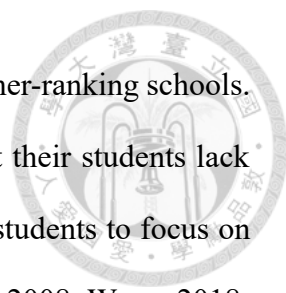
Teenagers are also aware of the tension between romantic relationships and academic success (Huang, 2019; Choi, 2012). Approximately half of the Taiwanese teens believe that having romantic relationships in high school may hurt their academic performance (Lin, 2020). This attitude is reflected in the survey results, which indicate that only about 30% of high school students in Taiwan have experienced romantic relationships (Lin,

2020). This percentage is significantly lower than that in the United States (Collins, 2003), indicating that dating is less common among Taiwanese teenagers. The study speculates the lower prevalence may be related to the tension students perceive in the highly academically competitive atmosphere.

The impact of the tension between academic pursuits and romantic relationships on the formation of romantic relationships may vary depending on the school academic context, as this context affects how students' academic abilities are evaluated (Domina et al., 2017). In Taiwan, high schools are highly stratified based on standardized test scores, which are the primary criterion for school admission. Students' academic ability can thus be assessed based on the ranking and relative prestige of the school they attend, which is publicly known (Chao, 2022). The evaluation of students' academic abilities further affects the school's control over their decision and opportunity to be romantically involved and the perceived importance of studying among students.

2.2. The Effect of School Control

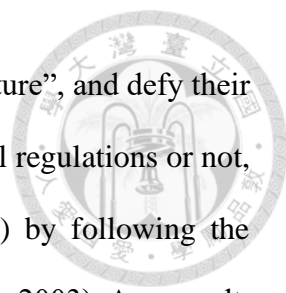
One of the factors influencing students' romantic involvement is the school's control (Huang, 2019). Students in higher-ranking schools face high educational expectations but fewer explicit constraints on their non-academic lives than those in lower-ranking schools (Choi, 2012; Fan, 2016; Wang, 2018; Yeh, 2015). This "freedom" is due to how teachers and parents evaluate these students. Their evaluation is based on the signals they receive from the school's relative standing, such as students' competence (Domina et al., 2017). Students in higher-ranking schools are believed to be "smart" enough to manage their time independently, due to the good academic achievement they got in high school entrance exams. In contrast, studies show that students in lower-ranking schools may face



stronger restrictions on their leisure time compared to students in higher-ranking schools. The school authorities of lower-ranking schools usually assume that their students lack academic ability. Therefore, they set more regulations to encourage students to focus on studying rather than on extracurricular activities or having fun (Chiu, 2008; Wang, 2018; Zhan, 2006).

The extent to which students feel restricted in their romantic pursuits may also be influenced by their perceived chances to attend selective colleges. The high school entrance exam assigns students to schools with different qualities and therefore influences the expectations of their future academic success (Domina et al., 2017). Choi (2012) and Wang (2007) suggested that females in academic-oriented schools may feel great tension between romantic relationships and schoolwork. Thus, these female students follow adults' expectations and avoid dating during high school. On the one hand, the students may be reluctant to follow the rules. On the other hand, they agree with the adults' discourse on delayed gratification: "Once you get into selective colleges, it will be worth it and you can date then." The tension between academic pursuits and romantic relationships conveyed by teachers or the public may thus negatively affect these students' romantic involvement.

However, the school regulations or advice on romantic involvement may be less effective for students in lower-track schools. Though dating may still be supervised or disciplined, these students know that they are less likely to succeed in the society of credentialism, therefore the restrictions cannot affect them (Willis, 1977). The perception of their future opportunities is not solely determined by their school's relative ranking. Teachers are also more likely to evaluate students' academic performance negatively in a poor academic



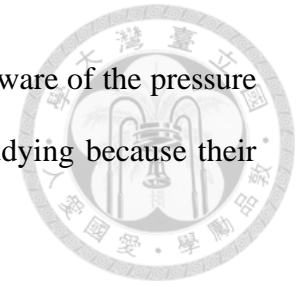
environment. Hence, some students may develop an “anti-school culture”, and defy their teachers’ teachings (Zhan, 2006). Whether students follow the school regulations or not, they nevertheless cannot be rewarded (going to good universities) by following the schools’ advice of not dating while in high school (Chiu, 2008; Huang, 2003). As a result, they are more likely to engage in romantic relationships while in high school, compared to their fellow counterparts in higher-track schools, who believe that the reward is not only valuable but also achievable.

2.3. Students’ Time Use

The decision of whether to pursue romantic involvement during high school is not always directly related to students' perceived importance of academic pursuit. The importance they place on academic achievement may also indirectly affect how they allocate their time and energy. Manski (1993) explained that students make decisions on how to allocate their time based on their expected returns in education. Consequently, students in higher-ranking schools may choose to spend more time studying, which leaves them with less time for social bonding. This is evident in Taiwanese adolescents who study long hours and sacrifice leisure time to achieve academic excellence (Yi & Wu, 2004). Conversely, students in lower-track schools may have more time or freedom for social bonding due to their relatively lower aspirations for higher education (Choi, 2008; Yeh, 2015; Zhan, 2006).

Another factor influencing students’ time use is the learning climate of a school. The prevailing behaviors of the student body affect what students perceive as normative and typical (Crosnoe, Johnson, & Elder, 2004; McFarland et al. 2014). Thus, they may conform to the school norm and behave similarly to their schoolmates. Even though

students in higher-ranking schools may not always be consciously aware of the pressure to excel academically, they may nevertheless spend much time studying because their schoolmates do so.



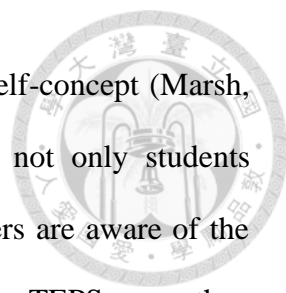
2.4. School’s “Romantic Climate”

While the learning climate may indirectly encourage or discourage students’ romantic involvement, the school’s “romantic climate” also impacts students’ romantic experiences. That is, students who attend high schools where romantic relationships are common are more likely to be romantically involved themselves (Hou, Natsuaki, Zhang, Guo, Huang, Wang, & Chen, 2013). As the common attitudes and behaviors of adolescents create a comparative context affecting what students perceive and experience what is normative (Crosnoe, Johnson, & Elder, 2004; McFarland et al. 2014), for students attending schools in which many peers are involved in romantic relationships, these students will feel the romantic relationships may be more socially acceptable (Hou et al., 2013). Based on the preceding discussion, the study expects that the percentage of romantically involved students would be lower in schools with lower average achievement, and therefore, students studying in lower-ranking schools are more likely to engage in romantic relationships.

Hypothesis 1: Students studying in schools with lower average academic achievement are more likely to be romantically involved.

2.5. Students’ Rank within The School and The School Context


Scholars have indicated that students’ academic pursuits may be shaped by both one’s rank within the school and the school-level academic performance, as students’ relative



position within their learning environment, affects their academic self-concept (Marsh, 1984; Marsh et al., 2000). The self-evaluation process involves not only students themselves but is also influenced by whether their teachers and peers are aware of the students' rank within the school. According to the survey result of the TEPS, more than 75% of the respondents reported that their schools publicize students' class ranks or rank within the school. The negative effect of publicizing students' ranks on students' mental health was discovered (Hsu, 2017).

In addition to self-evaluation, one's rank within the school and the school context may also affect the intensity of competition one faces. High-achieving students (i.e. students with high ranks in high-ranking schools) are believed to be stressed because of the intense competition they face (Cheng & Chen, 2017). These students compete for admission to selective colleges, which are highly differentiated. Conversely, lower-achieving students encounter less competition as they apply to a larger and less stratified admissions sector (Rosenbaum, 2001). Feeling great academic pressure and facing intense competition, they may tend to spend much time studying (Yi, Wu, 2004).

However, while both are top-ranking students, top-ranking students in lower-track schools may experience less academic pressure or competition (Cheng & Chen, 2017; Rosenbaum, 2001). Their rank within the school may be less significant for to students in lower-track schools. This may be because most students in these schools are more likely to adopt an "anti-school" culture, in which academic pursuit is not particularly emphasized or encouraged (Chiu, 2008; Zhan, 2006). This anti-school culture is developed because students and teachers know that there are few opportunities for students to succeed academically (Willis, 1977; Carter, 2005).



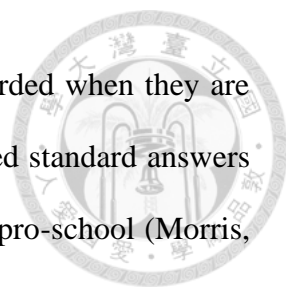
In short, high-ranking students in lower-track schools may face less academic competition or are more likely to downplay their academic achievement than their counterparts in higher-track schools. Hence, the study hypothesizes that the tension between academic pursuit and romantic involvement may vary between higher-ranking students in higher- and lower-track schools.

Hypothesis 2: The school-average achievement has a more pronounced effect on students' romantic involvement for students with higher school ranks than for those with lower school ranks.

2.6. School Context and Students' Romantic Relationships: The Gender Difference

Because people's perceptions of students' romantic experiences are different for male and female students, the effect of school context may vary by gender. Some scholars have argued that girls are often viewed as more vulnerable in romantic relationships than boys (Liu, Fuller, Hutton, & Grant, 2020). This may lead to adults opposing girls' romantic involvement more strongly than boys, as they believe that girls are more negatively affected by such relationships. For example, parents tend to set more rules for or have more restrictions on their daughters' dating behaviors (Huang, 2019; Madson, 2008). Although there has not been much literature on how school authorities may have different attitudes toward female and male students' romantic involvement, the study hypothesized that they may reflect parental expectations and act similarly to the concerned parents.

There is also a gender difference in the school's socialization of students, which affects the extent students conformed to the school context. To be specific, teachers have different definitions of "good students" for female and male students. While students are



all rewarded for achieving academic success, girls are usually rewarded when they are being “obedient”, rather than when they are challenging the so-called standard answers (Sadker & Sadker, 1994). Girls are thus socialized to become more pro-school (Morris, 2008).

Despite that all students may be aware of the tension between romantic involvement and academic success, girls are more likely to receive discouraging messages due to the gendered perception of adolescent romantic experience regarding the potential risk of dating (Liu et al., 2020). Therefore, girls may be more hesitant to pursue a romantic relationship due to concerns about the potential risk of romantic involvement, such as its negative effect on academic performance (Choi, 2012). They are also more likely to conform to the school climate because of their pro-school orientation (Legewie & Diprete, 2012). Hence, girls’ romantic involvement might be influenced more by the tension between romantic relationships and academic pursuits compared to boys.

Hypothesis 3: The negative effect of school-average achievement on students’ romantic involvement is more pronounced for girls than for boys.

3. Methods



3.1. Data

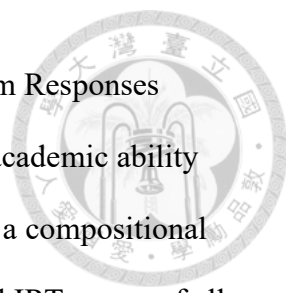
The study obtained data from the Taiwan Education Panel Survey (TEPS), a nationally representative project conducted by Academia Sinica from 2001 to 2007. The TEPS contains information reported by students, parents, and teachers to understand students' learning and life experiences. The TEPS provides information about school clusters, making it suitable for investigating the effect of school context. This study mainly used responses from the fourth wave of the TEPS, which was conducted when students were in 12th grade. This is because the fourth wave of TEPS is the only wave of the survey that asked students about their romantic experiences. The study used the “new” samples collected in the third wave instead of the first wave because some questions for the new and old samples are different. The samples that had transferred to another school from the third to fourth wave were also eliminated, as the change of school may make it hard to interpret the school effect. After excluding the missing values, the final sample consisted of 13,975 students from 260 high schools. They were born in 1988–1989 and were in the 12th grade in 2007.

3.2. Variables and Measurement

3.2.1. Dependent Variable

Romantic Involvement In the fourth wave of the TEPS survey, participants were asked if they had ever "fallen in love" (tan-lien-ai) when studying in high school. The study employed a binary outcome variable, with responses being coded as 1 if they had ever been in a relationship while in high school and 0 otherwise.

3.2.2. Independent Variables



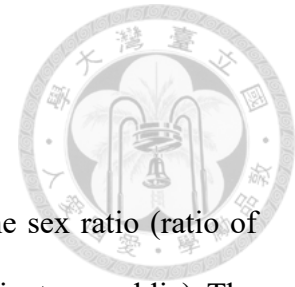
School-level Academic Performance The variable comes from an Item Responses Theory (IRT) test, an adequate indicator of the respondent's current academic ability (Yang, Tam, & Huang, 2003). School-level academic performance is a compositional variable (Bryk & Thum, 1989) calculated by averaging the individual IRT scores of all student participants from the same school. The study further used the technique of centering at the grand mean (CGM) to construct the variable (Enders & Tofighi, 2007). The "school academic context" in the preceding discussion is operationalized as "school-level academic performance" in the study.

Student's rank within the school The variable was first measured as the Z-score of the students' IRT score within their own schools. The Z-score was then centered at the group mean of the Z-score of their schools (Enders & Tofighi, 2007).

3.2.3. Mediators

Weekly Study Time Students were asked to report the time they spent on self-study, indicating that the time spent in schools, cram schools, and tutoring classes was deducted. The information was collected in the third wave when respondents were in 11th grade.

School Regulation The eleventh graders were also asked to comment on how stringent their schools' rules were. The answers were originally coded on a four-point Likert scale. (1 = "strongly agree", 2 = "agree", 3 = "disagree", 4 = "strongly disagree"). The responses were reversely coded. Therefore, having a high score indicates that the student thought the school was strict. This variable was used as a proxy for "if romantic relationships were prohibited at the school." However, as the original question did not specify the contents of the regulations, the results should be interpreted with caution.



3.2.4. Control Variables

The present study controlled three organizational characteristics: the sex ratio (ratio of the opposite sex) inside the school, school type, and school sector (private or public). The study also controlled six individual-level factors: gender, parent’s education level (represented by the higher one), family structure, family monthly income, family demand for school work, and romantic involvement in junior high school. “Family demand for school work” was used here to measure the control and expectations regarding academic performance from the family. This variable may affect not only students’ academic performance (which is related to how selective one’s school is and their rank within their schools) but also students’ freedom to explore romantic relationships.

The study must control the gender composition of the student body. Given that several of Taiwan’s top schools are single-sex institutions, the sex ratio might be connected to the academic environment of the institution. The school sex ratio has a significant effect on forming romantic relationships. According to the “demographic opportunity theory”, because relationships are by definition paired, a single-sex environment may be a barrier to heterosexual relationship formation by reducing the number of potential partners in the market (Uecker & Regnerus, 2010).

Table 1. Descriptive Statistics of the Analytical Sample

Variables	Male(N=6794)		Female(N=7,181)		All(N= 13,975)	
	Mean/ Percentage	SD	Mean/ Percentage	SD	Mean/ Percentage	SD
	Romantic Involvement in High School	29.6		35.32		32.54
School-level Academic Performance	1.69	1.1	1.69	1.08	1.69	1.09
Student’s Rank within The School (Z-score)	0.11	1.01	-0.05	0.93	0.03	0.97



Sex Ratio within The School (ratio of the opposite sex)	0.37	0.21	0.36	0.23	0.36	0.22
School Sector						
public	63.53		62.35		62.92	
private	36.47		37.65		37.08	
School Type						
general high school	55.36		53.06		54.18	
comprehensive high school	13.11		14.26		13.7	
vocational high school	21.87		18.1		19.94	
five-year junior college program	9.66		14.58		12.19	
Parents' Education Level						
junior high school or less	18.21		20.44		19.36	
high school	44.01		43.28		43.64	
college or more	37.78		36.28		37.01	
Family Monthly Income						
below NT\$20, 000	6.23		7.87		7.07	
NT\$20, 001~NTD\$30, 000	12.54		14.41		13.5	
NT\$30, 001~NTD\$50, 000	32.63		32.21		32.42	
NT\$50, 001~NTD\$100, 000	35.87		33.84		34.83	
NT\$100, 001~NTD\$200, 000	10.61		9.66		10.13	
above NT\$200, 001	2.12		2.01		2.06	
Family Demand for School Work						
at least one family member cared	57.68		49.24		53.35	
no one cared	42.32		50.76		46.65	
Family Structure						
non-intact families	15.18		17.16		16.19	
two-parent family	84.82		82.84		83.81	
Romantic Involvement in Junior High School	30.56		31.56		31.07	
Weekly Study Time (hours)	12.09	8.54	14.44	8.56	13.3	8.63
School Regulation	2.62	0.89	2.49	0.82	2.55	0.86

Note: Values in this table are not centered.

3.3. Model

To simultaneously consider the effect of the individual- and school-level factors, the current study adopts the multilevel logistic regression (MLR) analysis. Two models were

constructed. The first one examines the interaction between school-level academic performance and student's rank within the school. The second one investigates the interaction between school-level academic performance and gender. The level-1 equation in the first model is illustrated as the following:

$$\text{Logit}(y_{ij}) = \beta_{0j} + \beta_{1j} \cdot \text{Rank}_{ij} + \beta_{2j} \cdot C_{ij} + r_{ij}(1)$$

where i and j are indices for individual and school. y_{ij} is the probability of the individual romantic involvement; C_{ij} are sets of control variables of the individual levels. The coefficient of interest here is β_{1j} , which captures the effect of student's rank within the school; r_{ij} is the error term of the individual level.

The level-2 equation aiming to examine the model of school-level can be written as:

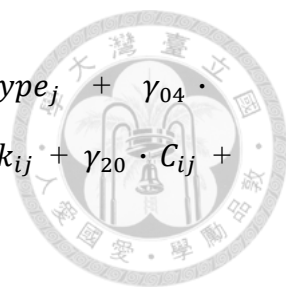
$$\beta_{0j} = \gamma_{00} + \gamma_{01} \cdot \text{Sex - ratio}_j + \gamma_{02} \cdot \text{Score}_j + \gamma_{03} \cdot \text{Sector}_j + \gamma_{04} \cdot \text{Type}_j + u_{0j}(2)$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} \cdot \text{Score}_j (3)$$

$$\beta_{2j} = \gamma_{20}(4)$$

Equation 2 is applied to test *Hypothesis 1*. γ_{00} is the average intercept across level-2 units; γ_{01} and γ_{02} are the effect of school sex ratio and school-level academic performances on the regression intercept; γ_{03} and γ_{04} are the effect of school sector and school type on the regression intercept; u_{0j} is the school-level error term. Equation 3 speaks to *Hypothesis 2*. γ_{10} is the average regression slope across the level-2 units; γ_{11} is the effect of school-level academic performance on the regression slope. The fourth equation indicates that the effect of individual-level control variables does not vary with school-level factors.

The combined equation should be expressed as Equation 5:



$$\text{Logit}(y_{ij}) = \gamma_{00} + \gamma_{01} \cdot \text{Sex ratio}_j + \gamma_{02} \cdot \text{Score}_j + \gamma_{03} \cdot \text{Type}_j + \gamma_{04} \cdot \text{Program}_j + \gamma_{10} \cdot \text{School Rank}_{ij} + \gamma_{11} \cdot \text{Score}_j \cdot \text{School Rank}_{ij} + \gamma_{20} \cdot C_{ij} + u_{0j} + r_{ij}(5)$$

The second model follows the same logic and are shown below:

$$\text{Logit}(y_{ij}) = \beta_{0j} + \beta_{1j} \cdot \text{Female}_{ij} + \beta_{2j} \cdot C_{ij} + r_{ij}(1)$$

$$\beta_{0j} = \gamma_{00} + \gamma_{01} \cdot \text{Sex - ratio}_j + \gamma_{02} \cdot \text{Score}_j + \gamma_{03} \cdot \text{Sector}_j + \gamma_{04} \cdot \text{Type}_j + u_{0j}(2)$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11} \cdot \text{Score}_j (3)$$

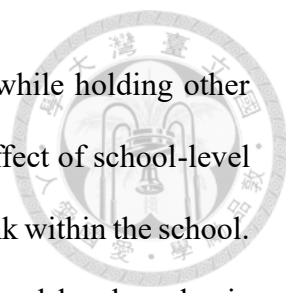
$$\beta_{2j} = \gamma_{20}(4)$$

$$\text{Logit}(y_{ij}) = \gamma_{00} + \gamma_{01} \cdot \text{Sex ratio}_j + \gamma_{02} \cdot \text{Score}_j + \gamma_{03} \cdot \text{Sector}_j + \gamma_{04} \cdot \text{Program}_j + \gamma_{10} \cdot \text{Female}_{ij} + \gamma_{11} \cdot \text{Score}_j \cdot \text{Female}_{ij} + \gamma_{20} \cdot C_{ij} + u_{0j} + r_{ij}(5)$$

Equation 1 is the level-1 equation, where β_{1j} now captures the effect of gender. Equation 2 and Equation 4 are the same as the equations in the first model. Equation 3 now speaks to Hypothesis 3. The hypothesis suggests that school-level academic performance interacts with gender. Finally, Equation 5 is the combined equation.

3.4. Analytic Strategy

Multilevel logistic regression was applied to all models. In Model 1 and Model 2, the main effect of school- and individual-level academic performance were examined respectively. In Model 3, the study tested the effect of the interaction between school-level academic performance and student's rank within the school. However, in logistic regression, the sign, the value, and the significance of the product term are likely to be biased (Sommet & Morselli, 2017). Therefore, the likelihood-ratio test was used to compare the model with and without the interaction term. If the two models are



significantly different, the interaction effect is significant. Second, while holding other variables at their means, the study calculated the average marginal effect of school-level academic achievement and plotted it for various levels of students' rank within the school. Through this process, the research investigated how the effect of school-level academic performance on students' romantic involvement varies with students' rank within the school.

Next, to understand whether the main effect of school-level academic performance varies with gender, the study tested the effect of interaction between school-level academic performance and gender in Model 4. The procedure to examine the interaction between school- and individual-level academic performance was also conducted here. The next step was to investigate the possible mechanisms of the relationship between school-level academic performance and romantic involvement by testing the mediation effect of weekly study time in Model 5 and the effect of school regulation in Model 6. Finally, the likelihood-ratio test was conducted respectively to evaluate whether the two models are significantly different from Model 1. If the two models are significantly different, the mediation effect of the variable is thus significant. That is, the independent variable influences the mediator variable, which then influences the dependent variable.

4. Results

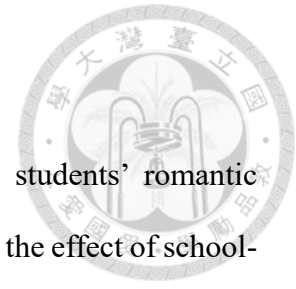
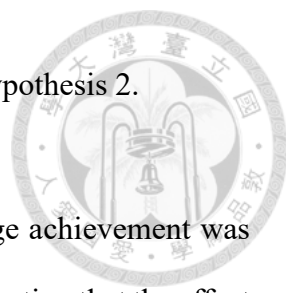


Table 2 presents multilevel logistic regression models predicting students' romantic involvement. The coefficients are log odds. The first column presents the effect of school-level academic performance. The result suggests that school-level academic performance is significantly related to one's romantic involvement. Students studying in schools with lower average achievement are more likely to be romantically involved. The second column shows the effect of students' rank within the school. The result suggests that the likelihood of being romantically involved does not vary with individual-level academic performance.

In Model 3, the effect of interaction between students' rank within their respective schools and school-average achievement was examined to test Hypothesis 2. The significant effect of the interaction term indicates that the effect of school-average achievement may vary with students' rank within the school. That is, students with the same rank within their respective schools may have different likelihoods to engage in romantic relationships when studying in schools with different average academic achievements. To confirm the significance of the interaction term, the study conducted the likelihood-ratio test. The test shows that there is a significant difference between the model with and without the interaction term. That is, the interaction effect is indeed significant. To further see the effect of the interaction, the model was plotted in Figure 1. According to the graph, school academic context has no significant effect on the lowest-ranking students (z -score=-2 and -3 within the school). This is because, for these students, the 95% confidence intervals of the school-level academic performance include 0. However, for higher-ranking students, the confidence intervals do not include zero, suggesting that the likelihood of being romantically involved does vary significantly with the school



academic context for higher-ranking students. The result supports Hypothesis 2.

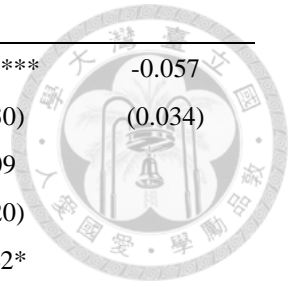
Next, the effect of the interaction between gender and school-average achievement was tested in Model 4. The effect of the interaction term is significant, indicating that the effect of school-level academic performance may vary with gender. The significance was also confirmed by the likelihood-ratio test. To visualize the interaction effect, the study plotted the average marginal effect of school academic context for boys and girls in Figure 2. The confidence interval for boys includes 0, indicating that school academic context has no significant effect on boys' romantic involvement. The result supports Hypothesis 3 which suggests that compared with boys, girls' romantic involvement varies more with the school context. From the analysis above, Hypothesis 1 is partially supported. Students studying in schools with higher average achievement are less likely to be romantically involved. However, the effect of school academic context is only significant for females and students with higher ranks within their schools.

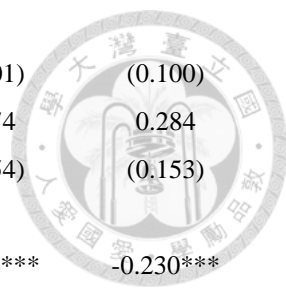
Finally, I examined the mediation effect of weekly study time and school regulation (students' perception of how stringent their schools' rules were) in Model 5 and Model 6. The coefficients are the odds ratio. The results from the likelihood-ratio test indicate that only "weekly study time" has a significant mediation effect. Nevertheless, because school academic context is still significant after the model includes this variable, weekly study time only partially explains the effect of school-level academic context on romantic involvement. There must be some underlying and unobserved mechanisms.

Table 2. Multilevel Analyses

Variables	Romantic Involvement			
	Model 1	Model 2	Model 3	Model 4

School-Level Academic Performance	-0.130*** (0.030)		-0.128*** (0.030)	-0.057 (0.034)
Student's rank within the school		0.017 (0.020)	0.009 (0.020)	
School-Level Academic Performance x Student's rank within the school			-0.042* (0.018)	
Female	0.283*** (0.039)	0.289*** (0.041)	0.279*** (0.039)	0.270*** (0.039)
School-Level Academic Performance x Female				-0.146*** (0.036)
Sex Ratio Within the School	0.679*** (0.091)		0.679*** (0.091)	0.675*** (0.090)
School Sector				
private	0.046 (0.054)		0.046 (0.054)	0.041 (0.052)
School Type				
comprehensive high school	-0.029 (0.066)		-0.024 (0.066)	-0.034 (0.065)
vocational high school	-0.088 (0.064)		-0.084 (0.064)	-0.089 (0.062)
five-year junior college program	-0.202* (0.082)		-0.201* (0.082)	-0.210** (0.079)
Parent's Education				
high school	0.148** (0.053)	0.128* (0.053)	0.146** (0.053)	0.154** (0.053)
college or more	0.070 (0.061)	0.016 (0.060)	0.069 (0.061)	0.077 (0.061)
Family Monthly Income				
NT\$20,001~NTD\$30,000	0.015 (0.089)	-0.004 (0.089)	0.010 (0.089)	0.022 (0.089)
NT\$30,001~NT\$ 50,000	0.168* (0.081)	0.145 (0.081)	0.162* (0.081)	0.176* (0.081)
NT\$50,001~NT\$100,000	0.207* (0.084)	0.174* (0.084)	0.201* (0.084)	0.216** (0.084)
NT\$100,001~NT\$200,000	0.284**	0.239*	0.279**	0.291**





	(0.100)	(0.100)	(0.101)	(0.100)
above NT\$200, 001	0.279	0.237	0.274	0.284
	(0.154)	(0.154)	(0.154)	(0.153)
Family Structure				
two-parent family	-0.228***	-0.244***	-0.226***	-0.230***
	(0.052)	(0.052)	(0.052)	(0.052)
Family Demand for School Work				
at least one family member cared	-0.101**	-0.075	-0.099*	-0.105**
	(0.039)	(0.039)	(0.039)	(0.039)
Romantic Involvement in Junior High School				
yes	1.180***	1.191***	1.180***	1.176***
	(0.039)	(0.039)	(0.039)	(0.039)
Constant	-1.532***	-1.249***	-1.529***	-1.527***
	(0.103)	(0.091)	(0.103)	(0.103)
Intercept Random Effect	-2.232***	-1.503***	-2.227***	-2.558***
	(0.397)	(0.139)	(0.394)	(0.733)
Observations	13975	13975	13975	13975
AIC	16474.826	16559.778	16472.956	16460.288
BIC	16618.181	16665.408	16631.402	16611.189
Log-likelihood	-8218.413	-8265.889	-8215.478	-8210.144

* p<0.05, ** p<0.01, *** p<0.001

Table 3. The Mediation Analysis

Variables	Romantic Involvement	
	Model 5	Model 6
School-Level Academic Performance	0.898*** (0.027)	0.881*** (0.026)
Weekly Study Time	0.983*** (0.002)	
School Regulation		1.045 (0.025)
Female	1.382*** (0.055)	1.332*** (0.052)
Sex Ratio Within the School	1.947*** (0.179)	1.976*** (0.180)



School Sector		
private	1.060 (0.057)	1.025 (0.056)
School Type		
comprehensive high school	0.943 (0.063)	0.972 (0.064)
vocational high school	0.876* (0.057)	0.915 (0.058)
five-year junior college program	0.775** (0.065)	0.845* (0.071)
Parent's Education		
high school	1.169** (0.063)	1.158** (0.062)
college or more	1.092 (0.066)	1.074 (0.065)
Family Monthly Income		
NT\$20, 001~NTD\$30, 000	1.012 (0.090)	1.015 (0.091)
NT\$30, 001~NT\$ 50, 000	1.180* (0.096)	1.182* (0.096)
NT\$50, 001~NT\$100, 000	1.223* (0.102)	1.229* (0.103)
NT\$ 100, 001~NT\$200, 000	1.313** (0.132)	1.327** (0.133)
above NT\$200, 001	1.317 (0.203)	1.323 (0.203)
Family Structure		
two-parent family	0.804*** (0.042)	0.795*** (0.041)
Family Demand for School Work		
at least one family member cared	0.924* (0.036)	0.901** (0.035)
Romantic Involvement in Junior High School		
yes	3.211*** (0.126)	3.246*** (0.128)
Constant	-1.336***	-1.639***



	(0.107)	(0.119)
Intercept Random Effect	-2.173***	-2.269***
	(0.360)	(0.421)
Observations	13975	13975
AIC	16427.864	16473.372
BIC	16578.764	16624.273
Log-likelihood	-8193.932	-8216.686

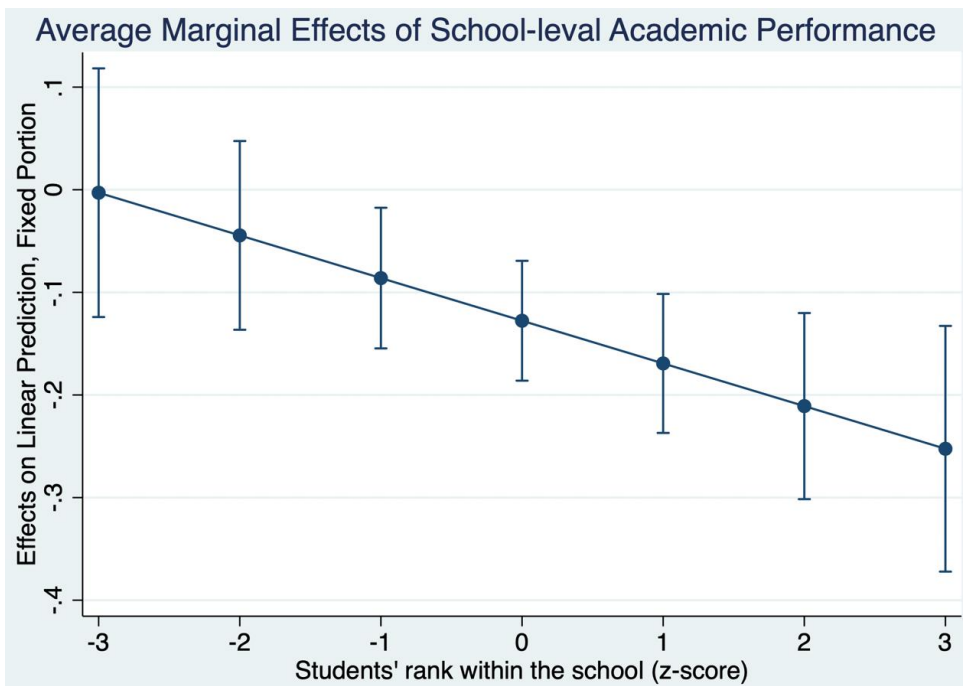


Figure 1. The Interaction Effect between School-Level Academic Performance and Students' Rank Within The School

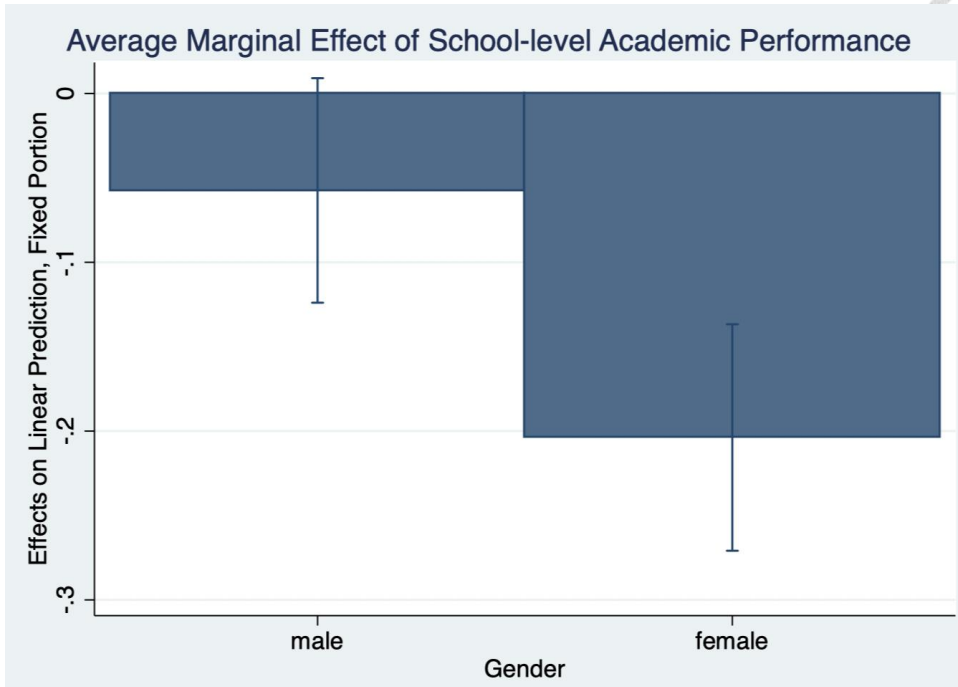


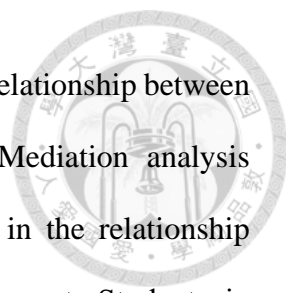
Figure 2. The Interaction Effect between School-Level Academic Performance and Gender



5. Conclusions

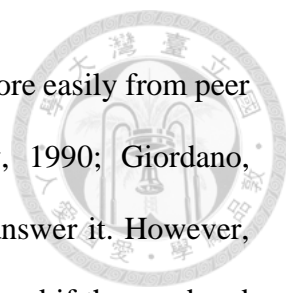
By investigating the effect of school academic context on Taiwanese adolescents' romantic involvement, the current study aimed to explore the tension between academic pursuit and romantic relationships. Therefore, I proposed three hypotheses: first, students attending schools with higher average academic achievement are less likely to be romantically involved; second, females' romantic involvement is more affected by school-average achievement than males' romantic involvement; third, the likelihood of romantic involvement varies more with school-average achievement for students with higher ranks within the school than for students with lower ranks within the school. The results support most of the hypotheses. However, the effect of school average academic achievement is only significant for girls and those with higher ranks within their schools ($z > -1$).

First, the study discusses the main effect of school-level academic performance. Choi (2012) adopted the concept of “accommodation” (Anyon, 1984), suggesting that female elite high school students view attending prestigious universities as an important value or the only option, and thus, they are less likely to actively seek romantic partners. This is due to concerns over disapproval from adults and the challenge of balancing academic pursuits and romantic relationships. They are willing to give up romantic involvement because they perceive the goal as important and achievable. Conversely, for students in lower-track schools, the pursuit of romantic involvement may not conflict with academic aspirations as selective colleges may be out of reach. The paper suggests that further research is necessary to understand the experiences of students in lower-ranking schools.



The study also explored the underlying mechanisms that explain the relationship between school academic context and individual romantic involvement. Mediation analysis reveals that weekly study time plays a significant mediating role in the relationship between school academic context and students' romantic involvement. Students in schools with high academic performance may be more motivated to spend a substantial amount of time studying. Whether students intentionally reduce the time for developing romantic relationships or not, the freedom of exploring the romantic world is likely to be compromised. Previous studies have also stressed the importance of "time". For example, it is suggested that female students in academic-oriented environments worry about whether they will have enough "time" for both studying and dating (Choi, 2012). In contrast, the mediation analysis indicates that perceived school strictness does not act as a significant underlying mechanism. This may be because teachers' disapproval of romantic involvement may not be explicitly reflected in school regulations but rather conveyed in a subtle manner (Huang, 2019). All in all, the emphasis on academic success embedded in the school context may hinder girls' involvement in romantic relationships, particularly for students in higher-performing schools.

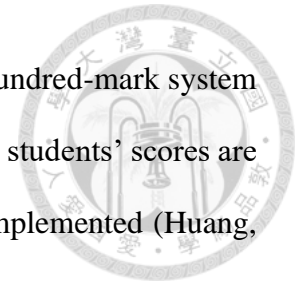
There is a significant gender difference in the impact of school-average achievement, which may be attributed to the gendered perception of adolescent romantic experience in which girls are often perceived as more vulnerable in romantic relationships. The gendered perception may lead them to be cautious in navigating the tension between academic pursuits and romance. For example, it is suggested that adolescents themselves believe that boys are more capable of handling the conflicts between education and relationships (Liu et al., 2020). Wu (2004) also discovered female vocational high school students are more concerned about the possible negative effects of romantic involvement



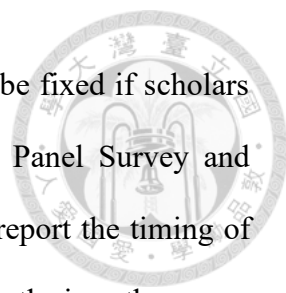
on their academic performance than boys. Whether boys transition more easily from peer interaction to romantic involvement is hotly debated (Maccoby, 1990; Giordano, Longmore, & Manning, 2001), and this study does not attempt to answer it. However, girls may be likely to have more constraints to be romantically involved if the gendered perception is accepted. Male students in elite schools have the privilege of behaving against social norms, which expect students to focus solely on studying, as teachers and parents believe they are “smart enough” to succeed in college (Wang, 2018). However, literature focusing on female students in academic-oriented environments highlights the constraints they face from adults (Fan, 2016).

Furthermore, the interaction between school-level academic performance and students’ rank within the school indicates that the school context only affects students with higher ranks within their schools, but not those with lower ranks within their schools. Low academic self-concept may account for the insignificant effect of school academic context on students with the lowest rank within their schools (Marsh, 1984). A lower rank than one’s peers makes one believe that they are not good at academics, resulting in a lower motivation to learn. When pursuing academic success is no longer important, they are free to date. As the effect of school context is insignificant, students in all learning environments may lose their academic self-concepts due to their lower rank within the school. Due to Taiwan’s achievement-segregated high school system, this study aims to highlight the differences between schools. However, this result suggests that future studies should examine in depth the effects of students’ rank within the school. As politicians strive to narrow the gap between schools, studying differences within schools becomes more crucial. For example, 2014 saw the reform of the national standardized test for high school admissions. Since 2014, the Comprehensive Assessment Program

(CAP) has replaced the Basic Competence Test. Compared with a hundred-mark system in the latter, the former has only three grades, so differences between students' scores are small. Differences between schools decreased after the CAP was implemented (Huang, 2021).



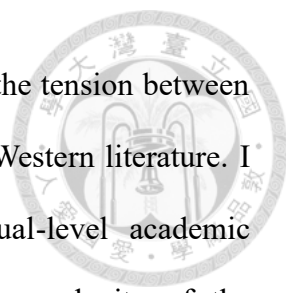
A few limitations of this study should be noted. Firstly, TEPS only asked whether students had been in a romantic relationship in high school; it did not ask when the relationship started. However, under an education system that prioritizes college admission exams, students' behavior may vary by grade level and age. For example, when students are in the 11th grade, they spend a lot of time on extracurricular activities, but when they are in the 12th grade, they spend all their time studying (Wang, 2018). It would therefore be ideal if the study could identify when romantic involvement began. The lack of timing in the data may also make the study hard to investigate causal relationships. This limitation should be treated with caution, as academic performance (or weekly study time) and romantic involvement may have a bidirectional relationship, so future studies should investigate this causal relationship more closely. For example, the negative relationship between weekly study time and romantic involvement may also indicate that romantic relationships cause one to spend less time studying. Thirdly, the way the survey questions were framed may have created confusion about what constitutes "romantic involvement". In the survey, students were asked whether they had ever "fallen in love with someone" (tan-lien-ai). There may be different interpretations of this question among respondents. For instance, one might respond "yes" even if they like someone but have not been in a relationship with them. Therefore, the results should be interpreted cautiously. Last but not least, it is unfortunate that there is so little literature about the climate at schools with lower average achievement in Taiwan. Hence, it would be ideal if mixed-method research



could be conducted to better support this point. The limitations can be fixed if scholars use the datasets of the TEPS-B. The TEPS-B (Taiwan Education Panel Survey and Beyond) is a follow-up survey of TEPS. It required respondents to report the timing of each romantic relationship they entered which lasted for over one month since they were fifteen years old.

Despite some limitations, this research contributes to the literature on the school academic context. Firstly, this study is an example of how school context influences students' non-academic lives. Romantic relationships, though considered rather private, are also embedded in the broader social context. Moreover, the study was conducted in Taiwan, with a culture emphasizing academic achievements, and with an achievement-segregated high school system (Huang, 2021). Taiwan's context is thus a special one for scholars to investigate the effect of the school "academic" context. Because the differences between schools are high compared to other countries (Huang, 2021). Marsh et al. (2000) used the example of Hong Kong to evaluate the relationship between school academic context and academic self-concept. They suggested that the highly achievement-segregated context may make the impact of negative contrasting effects larger than in the western world.

The study also contributes to the discussion of adolescent romantic relationships, a relatively understudied topic in Taiwan. Previous studies noted that "cultural context" matters. Each culture may have different "expected timing" and "appropriate characteristics" of romantic relationships (Feldman, Turner, & Araujo, 1999). However, East Asian studies regarding adolescent romantic relationships are fewer than those conducted by Western researchers. This study may catalyze further research on this topic

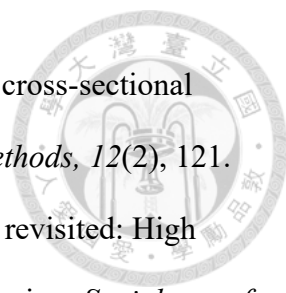



and develop theories from an East Asian perspective. For example, the tension between school and romance that this study explores is hardly discussed in Western literature. I also highlight the gender differences and variation in individual-level academic performance in students' romantic involvement, suggesting the complexity of the relationship between school context and dating. Finally, studying adolescent romantic relationships is important because they can have long-term effects on intimate relationships and marriages (Collins, Welsh, & Furman, 2009). The declining marriage rate is a serious problem in Taiwan. Romantic experience in earlier life courses may be one of the explanations worth exploring.

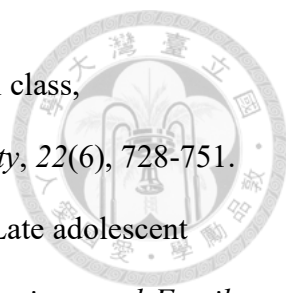


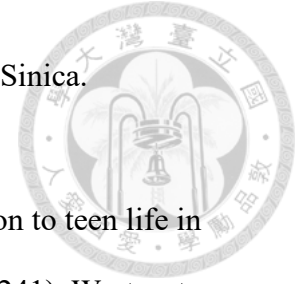
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