International Education Studies; Vol. 9, No. 8; 2016
ISSN 1913-9020 E-ISSN 1913-9039
Published by Canadian Center of Science and Education

Examining the Effects of Financial Aid on Student Persistence in Taiwanese Higher Education

Ching-Hui Lin[1]

[1] Department of Early Childhood Program, Asia University, Taiwan

Correspondence: Ching-Hui Lin, 500, Lioufeng Rd., Wufeng, Taichung 41354, Taiwan. Tel: 1-886-4-2332-3456-3632. E-mail: chinghui210@asia.edu.tw, chinghui.lin210@gmail.com

Received: January 7, 2016 Accepted: February 9, 2016 Online Published: July 26, 2016

doi:10.5539/ies.v9n8p36 URL: http://dx.doi.org/10.5539/ies.v9n8p36

Abstract

The purpose of this study was to examine the effects of financial aid policies on student persistence between the first and second year at a private four-year postsecondary institution in Taiwan. A two-phase sequential research design was employed with priority was given to the quantitative data–structural equation modeling (SEM). While the conceptual framework of this study was drawn from multiple research antecedents in relation to student persistence the major perspective guiding it was based on St. John's (1992) analysis of the research. Overall, the greatest effects on persistence were the measures of high school academic performance, followed by campus work, academic integration, social aspiration for attending college, financial aid, and parental supports, while neither parental educational attainments, faculty-student interactions, the practical value for future employment, nor peer relations were associated with students' decision to remain enrolled in college, results which merit further investigation. In sum, this study provides a necessary beginning step, more institutional research is needed in Taiwan to improve policy makers' and institutional researchers' understanding of the complex interplay between student financial aid and college experiences in students' decisions to persist in college as well as to develop a longitudinal database to identify ways to increase student success.

Keywords: financial aid policy, postsecondary access and equity, student persistence and college experiences

1. Introduction

Higher education is widely considered one of the greatest catalysts for upward mobility regardless of one's gender, socioeconomic background, and ethnicity. Because of its role in preparing people for the new global economy, it has assumed unprecedented significance within countries and internationally. In Taiwan, higher education institutions (HEIs) have expanded rapidly during recent decades. A noteworthy aspect of this expansion is the proliferation of private and vocationally oriented institutions. To date, 34% (55) of Taiwanese postsecondary institutions are national or government operated, while the rest (66% or 109) are private (MOE, 2008b). Of the 164 HEIs, about 57% (94) institutions are technical or vocational colleges. Sixty two of the HEIs are traditional universities or colleges, offering four-year and graduate programs, and the remaining eight institutions are normal or teacher education colleges. This expansion has led the Ministry of Education (MOE) and postsecondary institutions to restructure university governance in accordance with the ideas of neo-liberalism in combination with practices of decentralization and marketization in order to cope with rapid social and economic change (Mok, 2000). To allow HEIs greater flexibility as independent legal entities, the 1994 amendment of the University Act initiated major changes in the relationship between national and local university governance.

Between 2001 and 2012, the college enrollment rate rose from 61.35 to 88%, suggesting that Taiwanese higher education policy has successfully promoted student access to higher education (MOE, 2013). However, concomitant with rapid enrollment increases, higher education has been the growing likelihood of students dropping out. Between 2009 and 2011, there was a 10.3% increase in students leaving college, suggesting the need to investigate factors involved in such attrition and prompting policy makers and the public to consider the issue of student time-to-degree as a criterion of institutional accountability. Meanwhile, due to the fiscal pressure of the worldwide economic downturn, the MOE has had to reduce or withhold funding to HEIs while also holding constant the investment in financial aid programs for institutions. This has placed higher education institutions in a difficult situation. With public funds being limited and finances squeezed, they have been forced

to increase tuition costs to maintain course offerings and services, a trend that may particularly discourage low-income students and disadvantaged minorities, who are especially sensitive to tuition changes (Kim, DesJardins, & McCall, 2009), from completing a college degree.

In 2005, the re-authorization of University Law prompted the restructuring of HEIs into independent legal entities, thereby granting them greater autonomy and flexibility in searching for alternative revenues to generate sufficient operating funds (Mok, 2000; MOE, 2008a). As a result of these policy changes, both public and private institutions have become more reliant than ever on tuition costs as a revenue source (Tai, 2008). It follows that the burden of paying for higher education has increasingly fallen on students and their families, necessitating more loans and increasing student debt (MOE, 2009). This shift of the focus of financial aid policies from grants to loans and its inevitable increase of cost- sharing has imposed a particular burden on students from low-income families and disadvantaged minorities, who are more likely to rely on financial aid to attend colleges and universities.

Furthermore, there has been little research in Taiwan regarding how financial aid packages affect college students' decisions as to whether or not to remain enrolled. Yang and Chen (2009) investigated how Taiwanese junior college students paid tuition and fees in 2005 and compared the relationship between financial aid and family annual income in different disciplines between public and private institutions. The results indicated that students studying in public institutions had higher financial support from parents or relatives than those in private institutions. However, low- income students, whether they were at public or private institutions, did not have substantial financial support from their families, whose contributions accounted for 35.7% and 46% of total costs respectively. Moreover, 29.6% students in public institutions and 42.7% of students in private institutions relied on loans. This study indicates that while most college students are to some extent financially dependent on family support, student aid plays an important role, particularly in determining whether low-income students and disadvantaged minorities persist in college.

1.1 Research Purposes and Questions

The present study was undertaken with two purposes: (a) to describe a conceptual model of student persistence that emphasizes student financial aid options predicted to have a direct effect on retention; and (b) to estimate a model of freshmen retention and the variables associated with persistence. In this study, persistence was defined as a student's decision to re-enroll for a subsequent semester or year, and measured by a composite of academic intensity consisting of college grade point average (GPA) and number of credit hours in which students are enrolled.

The following three research questions guided the study:

1) To what extent does the composition of financial aid packages affect student persistence between the first and second year?
2) What variables mediate the effects of the composition of financial aid packages on persistence between the first and second year for students enrolled at four-year higher educational institutions in Taiwan?
3) To what extent do factors other than financial aid explain variations in the model of student departure proposed in this study?

1.2 Institutional Context

A private comprehensive university situated in the northern suburban of Taiwan constituted the context for the current study. Founded in 1962, the university consists of 12 colleges and 43 graduate institutes that offer master's and doctoral programs, in addition to an evening division. The mission statement addresses teaching, research, and service for almost every campus program. In addition to granting formal diplomas, the university also provides non-degree certificate programs and distance education for non-traditional students. At the time of the study the enrollment was about 25,000 students, and more than 59 undergraduate academic programs were offered to the approximately 3,000 new students who enrolled each fall. New freshmen in this study were traditionally- aged students who typically had entered directly from high school and attended the institution on a full-time basis. The majority (75%) lived with their family or relatives and commuted to campus, while a quarter lived in on-campus housing. The students' high school grade point averages were between 2.5 and 3.0. Besides being the type of institution in which the majority of low-income and minority students are enrolled, this university was selected for this study because, unlike national trends of increasing drop-out rates, its rates have been declining.

2. Related Research

There is a dearth of research on the effects of financial aid and changes in aid packages on Taiwanese students' enrollment decisions. Therefore, a conceptual framework and constructs related to financial aid in U.S. higher education were used as the reference to inform the design of this study, including the work of Tinto (1975, 1993), Bean (1978, 1980, 1983,1985a, 1985b) , St. John (1992, 2000, 2005), and Braxton and his associates (1995, 1996, 2002, 2004).

2.1 Tinto's Student Integration Model

Tinto's student integration model considers higher education as a social system that has its own values and social structure, in which student persistence reflects students' social and intellectual integration into their college communities (Tinto, 1975). The model assumes that students enter college with a range of individual attributes that are shaped by personal characteristics and precollege academic performance, which influence a student's level of educational expectation and goal commitment when entering the new environment (Pascarella & Terenzini, 1980, 2005). The central components in Tinto's model are academic and social systems, which directly and indirectly impact students' time to degree .The higher the levels of students' integration, the greater the likelihood of their completing a college degree. In spite of its lack of consideration of financial issues, Tinto's model has often been referenced as the theoretical framework in higher education retention studies.

2.2 Bean's Model of Student Attrition

Bean's (1985) model of student attrition emphasized students' academic and socialization processes during college, and significant predictors for student dropout behaviors included college grades, institutional fit, and institutional commitment (Bean, 1983, 1985a, 1985b). He further extended the model to non-traditional students in different types of institutions and identified relevant factors, including financial barriers, working for long hours, lack of encouragement, family responsibilities, and opportunity to transfer to other institutions (Bean & Metzner, 1985b). Bean's model (1980, 1982) contributed to understanding the role of external and environmental factors that affect college students' experiences and attrition behaviors.

2.3 Braxton's And St. John's Extension of Research on Institutional Factors

Braxton and his associates have focused on how institutional policies and practices affect students' social integration and retention (Braxton, Hirschy, & McClendon, 2004; Braxton & McClendon, 2001-2002; Stage & Hossler,1989), referencing psychological, sociological, economic, and organizational theories (Braxton, Vesper, & Hossler, 1995; Braxton, Sullivan, & Johnson, 1997). In particular, the factor of social integration, including faculty-student interactions and peer relations, was significantly to student persistence in different types of colleges and universities (Braxton et al., 2004). Furthermore, St. John (1992) used an existing institutional data source to develop a model for assessing the effects of financial aid on persistence decisions of undergraduates. The findings in his research provided evidence that finance-related choices have direct and indirect impacts on whether students persist in college (St. John et al., 1996; St. John, Hu, & Tuttle, 2000; St. John et al., 2005), and established the relationship between students' concerns about costs and financial aid and their persistence decisions. To sum up, the conceptual framework in this study draws upon multiple research antecedents that are relevant to student persistence, and the major perspective guiding this study is based on St. John's (1992) analysis of the research.

3. Methodology

The study was conducted in two distinct phases (Creswell, 2008, 2009) (see Figure 1). In the first phase, the qualitative findings from focus group interviews in combination with a literature review were used to construct the primary instrument, a web-based survey to be administered in the second phase. The survey questionnaire contained 25 items, from which measures for four exogenous variables and eight endogenous variables used in the analysis were taken. The reliability was measured by Cronbach's coefficient alpha, and averaged above .72, which indicates a high level of reliability and validity (Hair, Black, Babin, & Anderson, 2010). The phase of preliminary analyses was undertaken primarily for item-level data, including descriptive statistics computation and normality checking, distributions and reliabilities inspection, statistical assumption testing, and a series of factor analyses to finalize the items to be represented in the model for the structural equation modeling (Bollen, 1989; Wu, 2009). A total of 704 potential participants responded to the survey. The listwise deletion technique was employed to remove 164 cases with missing values on one or more items, resulting in 540 completed replies that were usable.

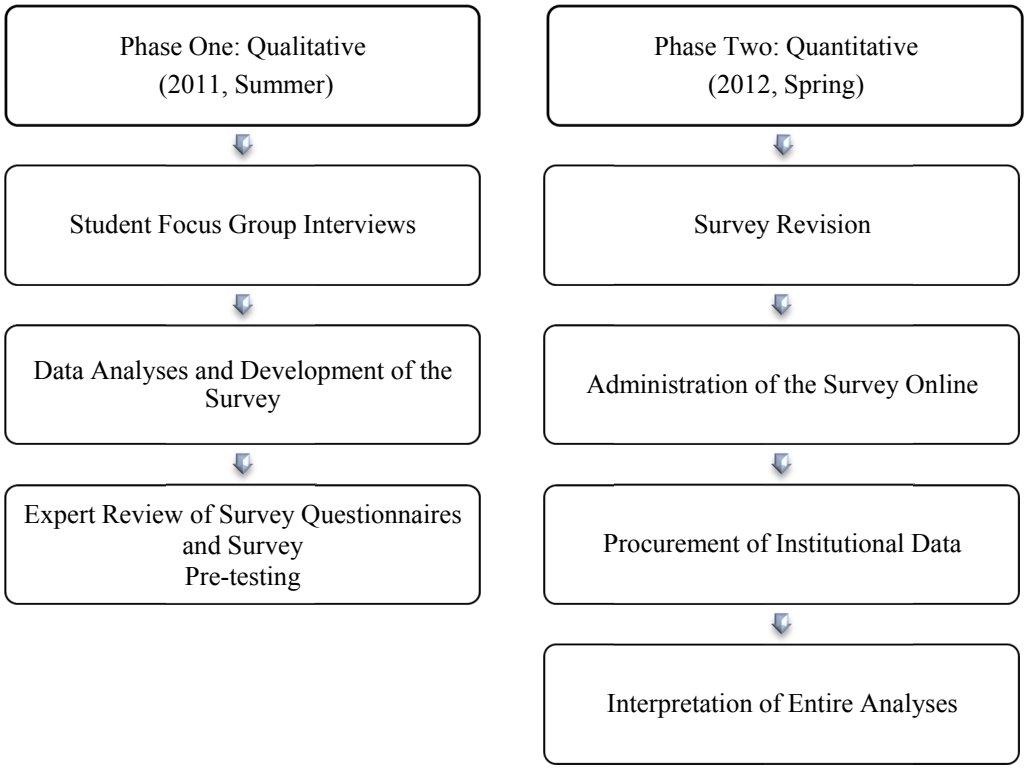

Figure 1. Visual research design for sequential exploratory strategy

3.1 The Conceptual Model

Figure 2 graphically displays the structural paths hypothesized in the present study. The single-headed arrows represent the direction of anticipated causation, and the curved arrows indicate correlations between constructs with no causation implied (Insert Figure 2 here). Each of the variables in the model could influence student persistence, but the ways in which this influence was exerted were expected to differ. All factors fell into six major constructs: (1) student characteristics, (2) initial institutional commitments, (3) college affordability, (4) integration, (5) college aspirations, (6) persistence. The present hypothesized path model regards integration as comprising three separate dimensions: academics, faculty- student interactions, and peer relations.

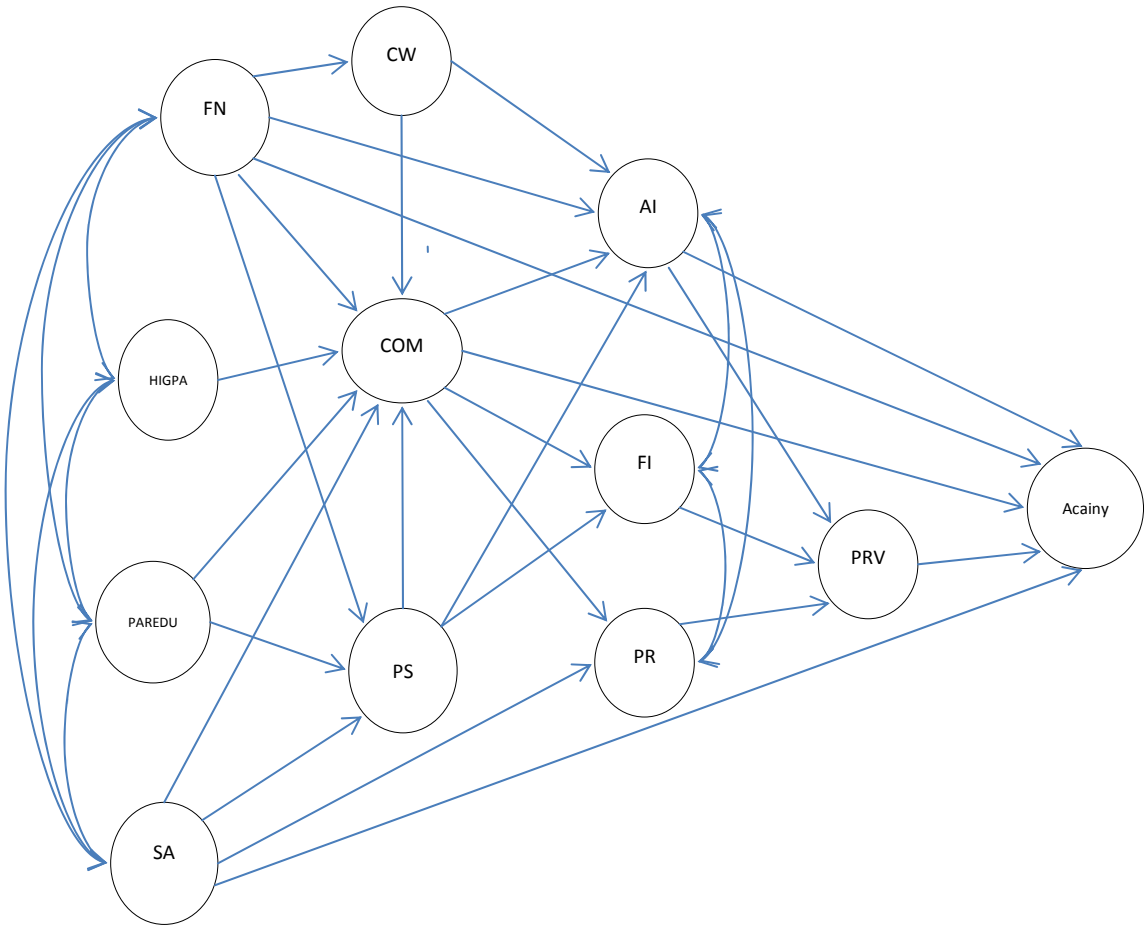

Figure 2. Conceptual framework

Additionally, precollege academic performance exerts direct effects on students' initial commitments, which motivate their participation in the academic component of the institution. The more students interact with the institution, the more likely they will be committed to staying. These variables should be positively related to student persistence, and it is presumed that the extent to which students are encouraged by their parents to pursue a college education can affect their academic and social integration within an institution. In sum, students' high school performance, parental educational attainment, and financial needs are classified as exogenous variables, whereas the remaining variables are endogenous, used to estimate the model. All variables are listed and described in Table 1.

Table 1. Listing and definition of variables

Variables	**Definitions**
Student ID	Student identification
A. Student characteristics	Student entry characteristics
1. Gender	Male of female identification
2. Ethnicity	Racial/ethnic group
3. High school performance	Student-reported grades received in high school
4. Parental socioeconomic status	Level of parents' education
5. First-generation status	Students whose parents never pursued postsecondary education
6. Admission paths	Ways for students to be admitted postsecondary institutions

B. Institutional commitment	Certainty of institutional choice
C. College affordability	Ability to pay college costs
1. Financial needs	Sources of finances needed for paying for tuition costs
2. Campus work	Having a job on- or off-campus to stay in school
D. Integration	The degree to which a student's experience engages in the academic systems && communities of an institution
1. Academic integration	The degree to which a student engages studying within an institution
2. Faculty- student interaction	A student's in-class && out-of-class interactions with faculty members
3. Social integration	A student's peer group relations at an institution
E. College aspirations	The desirability of getting a college education
1. Parental supports	Encouragement && support from parents for a student to continue to enroll
2. Social aspirations	The degree to which a student attributes the necessity to complete his/her college degree to social/cultural expectations
3. Practical value for future employment	The degree to which a student perceives that his/her education will lead to future employment
F. Persistence	The composite of academic intensity, comprising three survey items that represent whether the student persisted in an institution
1. College GPA	The degree to which a student has demonstrated his/her capability to perform in an institution
2. Hours enrolled	The number of semester hours enrolled in spring, 2012
3. Enrollment status	Whether or not student persist in fall semester, 2012

4. Data Analysis

4.1 Results from Descriptive Statistics

This section presents demographic information for the participants, all first-year students at Taiwan Peace University (pseudonym). Responses to the 20-item survey were measured with a 4-point Likert scale with "completely agree" at the highest end and "completely disagree" at the lowest end. Table 2 summarizes descriptive statistics for the sample. As shown, out of 540 cases, 54.8% of the sample comprised females, and 45.2% males. The composition of the student population was diverse, and the group of Islanders (often referred to as Min-nans) was the largest, accounting for 43.5% of the sample. Over three quarters (75.2%) of the students' high school GPA ranged between B and C. Parents' highest level of educational achievement, a common proxy for socioeconomic background, often has a significant influence on their children's college aspirations (Stage & Hossler, 1989; St. John et al., 1996). The results revealed that 129 students (18.8%) reported that either one or both parents held a bachelor's degree or above, indicating that the majority would be first-generation college students. With regard to students' finances, it is noteworthy that as many students applied for financial aid as did not, indicating that financial factors play an important role in college attendance. During their first year, nearly 59% of the students received financial aid, and the most frequently received form of aid was loans (16.2%) and scholarships (15%), followed by grants (9.9%).

Table 2. Demographic profile of freshmen undergraduates at Taiwan P University

Variables		Frequency	Percent
Gender	Male	244	45.2
	Female	296	54.8
Race	Mainlanders	59	8.6
	Islanders	298	43.5
	Hakka	70	10.2
	Aborigines	8	1.2
	Taiwanese	95	13.9
	Others	10	1.5
High school GPA	A or A+	10	1.9
	A-	10	1.9
	B+	45	6.6
	B	117	17.1
	B-	138	20.1
	C+	113	16.5
	C	72	10.5
	C-	30	4.4
	D	5	0.7
Admission type	Unifying examination & placement	298	43.5
	School recommendation	32	4.7
	Individual application	168	24.5
	Athletics recruitment	4	0.6
	Institution individual recruitment	5	0.7
	Others	33	4.8
Financial aid status	Yes	270	50
	No	270	50
Financial aid packages	Grants only	68	9.9
	Scholarships only	103	15.0
	Loans only	111	16.2
	Work-study only	28	4.1
	Grants & loans	19	2.8
	Scholarships & loans	19	2.8
	Work-study & loans	8	1.2
	Grants & work-study	3	.4
	Scholarships & work-study	7	1.0
	Loans & other scholarships	28	4.1
	All of the above	10	1.5
	None of the above	136	19.9
Parents educational level			
Father	Did not finish high school	103	15.0
	Graduated from high school	218	31.8
	Attended college but did not complete degree	90	13.1

	Completed a bachelor's degree	103	15.0
	Completed a master's degree or above	26	3.8
Mother	Did not finish high school	93	13.6
	Graduated from high school	283	41.3
	Attended college but did not complete degree	77	11.2
	Completed a bachelor's degree	74	10.8
	Completed a master's degree or above	13	1.9

N=540.

4.2 Results from Structural Equation Modeling-Path Analysis

4.2.1 Goodness of Model Fit

For the model estimation, I drew on the Maximum likelihood (ML) technique supported by SIMPLIS to compute its parameters. Maximum likelihood estimation provides goodness-of-fit (GOF) measures to examine whether the covariance matrix implied by the model differed significantly from the observed covariance matrix among the indicator items for the model evaluation (Hair et al., 2010) (See Table 3). The chi-square statistic is the fundamental measure used to determine whether the model fits the data or not. A nonsignificant chi-square statistic indicates that the proposed model accurately represents the data. The closer the value between the observed and estimated covariance matrices, the better is the fit. The Goodness-Of-Fit index was used as a second measure of model fit that fell into three types, including absolute measures, incremental measures, and parsimony fit measures (Bollen, 1989; Hair et al., 2010; Wu, 2009). Absolute fit indices refer to $\chi 2$ statistics, the goodness-of-fit index (GFI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR), while incremental measures include the normed fit index (NFI), the comparative fit index (CFI), the Tucker-Lewis index (TLI), the relative noncentrality index (RNI), and the incremental fit index (IFI). Parsimony fit indices comprise the adjusted goodness of fit index (AGFI), the parsimony normed fit index (PNFI), and critical N (CN). As a general rule, a goodness-of-fit index equal to or above .90 indicates that the model accurately represents the data for the study.

Table 3. Overall fit indices for the path analyses and the criteria

GOF indices	Value	Criteria
Absolute measures		
χ^2	30.48 (p= .21)	p > .5 (nonsignificant value)
df	25.00	less than 3
χ^2/df ratio	1.22	< 3
SRMR	0.03	< .05
RMSEA	0.02	< .05
GFI	0.99	the higher the better
Incremental measures		
NFI	0.95	> .95
CFI	0.99	> .95
RNI/RFI	0.88	> .95
NNFI/TLI	0.98	> .95
IFI	0.99	> .90
Parsimony measures		
AGFI	0.97	> .50
PGFI	0.32	> .50
CN	780.24	> 200

As evidenced by Table 3, all of the fit indices pointed to a nearly perfect fit of the model for the data. First, the χ^2 square test generated a non-significant value of 30.48 with 25 degrees of freedom ($p = .21$) and a satisfactory χ^2/df ratio (1.22). Second, the model produced SRMR and RMSEA values that were well within the acceptable criteria, and the GFI also achieved an impressive value of .99. Third, all of the incremental fit indices were higher than the criteria values. Furthermore, an examination of the Q-plot of standardized residual revealed no residual with a magnitude larger than 2.58% of the data. On the whole, the goodness-of-fit indices and the standardized residual matrix both indicated the model as a good representation of the data.

4.2.2 Findings

Figure 3 displays standardized coefficients for the model. Hypothesized effects that were found to be significant are represented by a solid line, while dotted lines represented nonsignificant effects (Insert Figure 3 here). For the entire sample, the five variables significantly related to academic intensity ($p \leq .05$), in descending order of magnitude, were: high school GPA (-.20), campus work (-.18), academic integration (.16), social aspiration (.11), and financial needs (.10). Three variables were significantly indirectly related to academic intensity, including financial needs (-.07), students' initial institutional commitment (.02), and parental supports (.02). With the exception of parental educational attainments, faculty-student interactions, and peer relations, all of the other relationships were in the expected direction.

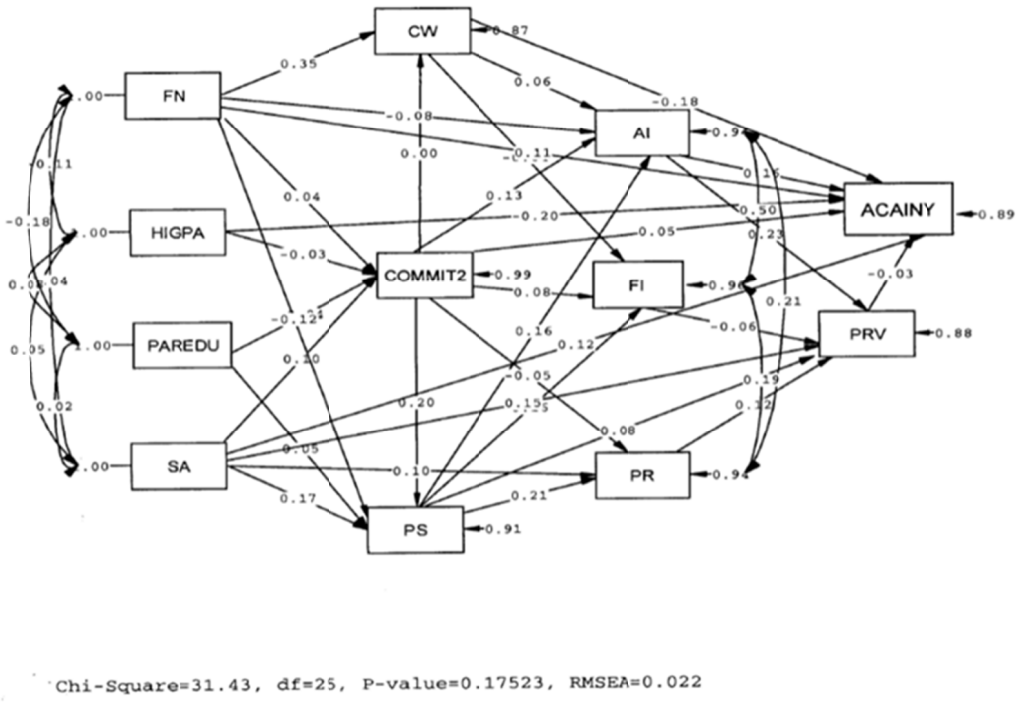

Figure 3. Path analysis

4.2.2.1 Findings for the Endogenous Variables

Table 4 and Table 5 present the effects decompositions that summarize the direct, indirect, and total effects that are placed between the exogenous and endogenous variables on the composite of academic intensity (Insert Table 5 and 6 here). Overall, the data confirm the expectations from the model for the role of financial aid policy and the composite of academic intensity but offer limited support for the background variable parental educational attainments.

Campus work. The first equation in the model examined the effects of financial aid and students' initial institutional commitments on the measure of campus work. Only financial needs ($\gamma = .35$) exerted significant effects on campus work. Although it was predicted that having their work on campus would have positive effects on students' initial institutional commitments, no support was found for this hypothesis. Financial aid and

students' initial institutional commitments accounted for 13 % of the variance in campus work (R2 = .13).

Initial institutional commitments. The second equation in the model examined the effects of social aspirations, financial aid, precollege academic performance (high school GPA), and parental educational attainments on the measure of students' initial institutional commitments. This construct is associated with a student's commitment to the institution and its academic program. Only social aspirations exerted directly significant effects on students' initial institutional commitments (γ = .10). However, only 1% of the variance in students' initial institutional commitments was explained by all the above factors (R2 = .01).

Parental supports. The third equation in the model examined the effects of students' initial institutional commitments, social aspirations, financial aid, and parental educational attainments on the measure of parental supports. Those factors accounted for 9 % of the variance in parental supports (R 2 = .09). Three factors were found to have significant effects on parental supports. The largest effect was exerted by initial institutional commitments (β = .42), followed by social aspirations (γ = .19) and financial aid (γ = -.12).

Academic integration. The fourth equation in the model examined the effects of campus work, initial institutional commitments, parental supports, and financial aid on the measure of academic integration.

With the exception of campus work, these were found to have significant effects on academic integration. The greatest influence on academic integration was exerted by parental supports (β = .16), followed by students' initial institutional commitments (β = .13) and financial aid (γ = -.08). These factors accounted for 6% of the variance observed in academic integration (R2 = .06).

Faculty-student interaction. The fifth equation in the model examined the effects of campus work, students' initial institutional commitments, and parental supports on the measure of faculty-student interactions. Of these, only parental supports was found to have positive effects on the interaction between faculty members and students (β = .16). The proportion of variance explained by those factors in faculty-student interaction is 4% (R2= .04).

Peer relations. The sixth equation in the model tested the effects of initial institutional commitments, parental supports, and social aspirations on measures of peer relations. A total of 6% of the variance observed was in peer relations (R2 = .06). Both parental supports and social aspirations were found to have positive effects on peer relations that facilitate the transition of the student into the academic community. The largest direct effect was found for parental supports (β = .21), followed by social aspirations (γ = .10).

Practical value for future employment. This construct reflects students' interest in practical outcomes such as better employment opportunities and job-related skills, which motivated them to persist. The equation in this model examined the effects of parental supports, academic integration, faculty-student interaction, peer relations, and social aspirations on practical value for future employment. A total of 12% of the variance was observed in practical value for future employment (R2 = .12). Three of the five factors were found to have significant direct effects on practical value for future employment, the most influential of which was exerted by academic integration (β = .23), followed by social aspirations (γ = .15) and peer relations (β = .23).

The composite of academic intensity. The last equation in the model examined the effects of campus work, students' initial institutional commitments, academic integration, practical value for employment , social aspirations, financial aid, and precollege academic performance (indicated by high school GPA) on the composite of academic intensity, which reflects students' actual persistence behaviors in an institution. All these factors accounted for 11% of the variance in the composite of academic intensity (R2 = .11). Five of the seven factors were found to have significant effects. Precollege academic performance produced the largest though negative effect (γ = -.20) on the composite of academic intensity, followed by campus work (β = -.18), academic integration (β = .16), social aspirations (γ = .12) and financial aid (γ = .11).

Table 4. Decomposition of the total causal effects on student persistence (endogenous variables)

Constructs	Campus work			Commitment			Parents support			Academic integration		
	direct	indirect	total	direct	indirect	total	direct	indirect	total	direct	indirect	total
Campus work	--	--	--	0.00	--	0.00	--	--	--	--	--	--
Commitment	--	--	--	--	--	--	--	--	--	--	--	--
Parents support	--	--	--	0.20**	--	0.20**	--	--	--	--	--	--
Academic integration	0.06	--	0.06	0.14**	0.03**	0.17**	0.16**	--	0.16**	--	--	--
Faculty interaction	-0.04	--	-0.04	0.08	0.03**	0.11**	0.16**	--	0.16**	--	--	--
Peer relations	--	--	--	-0.04	0.04**	0.00	0.21**	--	0.21**	--	--	--
Practical value	0.00	0.02	0.02	0.00	0.05**	0.05**	0.08	0.05**	0.13**	0.23*	--	0.23*
Academic intensity	0.18*	0.01	0.17*	0.05	0.02**	0.07	0.00	0.02*	0.02**	0.16*	-0.01	0.15*

p* ≤ .05; p** ≤ .01.

Table 5. Decomposition of the total causal effects on student persistence (endogenous variables) (cont')

Constructs	Faculty interaction			Peer relations			Practical value		
	direct	indirect	total	direct	indirect	total	direct	indirect	total
Campus work	--	--	--	--	--	--	--	--	--
Commitment	--	--	--	--	--	--	--	--	--
Parents support	--	--	--	--	--	--	--	--	--
Academic integration	--	--	--	--	--	--	--	--	--
Faculty interaction	--	--	--	--	--	--	--	--	--
Peer relations	--	--	--	--	--	--	--	--	--
Practical value	-0.06	--	0.06	0.12**	--	0.12**	--	--	--
Academic intensity	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	--	0.03

p* ≤ .05; p** ≤ .01.

4.2.2.2 Findings for the Exogenous Variables

According to the model, exogenous variables, including financial aid, precollege academic performance (high school GPA), parental educational attainments, and social aspirations, were expected to have important direct effects on the composite of academic intensity. In fact, the construct of parental educational attainments was unrelated to student persistence behaviors and also failed to exert significant effects on other endogenous variables. Financial aid, precollege academic performance and social aspirations were found to have significant effects on student persistence, while, unexpectedly, precollege academic performance (-.20) had a negative effect on persistence behaviors. The effects of financial aid were found to be statistically significant including direct (.10) and indirect effects (-.07). Social aspirations exerted directly significant effects on the likelihood of departures (.12).

Table 6. Decomposition of the total causal effects on student persistence (exogenous variables)

Constructs	Social Aspiration			Financial Needs			High School GPA			Parents Education		
	direct	indirect	total	direct	indirect	total	direct	indirect	total	direct	indirect	total
campus work	--	--	--	--	--	--	--	--	--	--	--	--
commitment	0.10*	--	--	--	--	--	--	--	--	--	--	--
parents support	0.17**	--	--	--	--	--	--	--	--	--	--	--
academic integration	--	--	--	--	--	--	--	--	--	--	--	--
faculty interaction	--	--	--	--	--	--	--	--	--	--	--	--
peer relations	0.08*	--	--	--	--	--	--	--	--	--	--	--
practical value	0.15**	--	0.06	0.12**	--	0.12**	--	--	--	--	--	--
academic intensity	0.11**	0.00	0.00	0.00	0.00	0.00	-0.03	--	0.03	-0.03	--	0.03

p* ≤ .05; p** ≤ .01.

5. Conclusion

The present study provides an exploration of year-to-year persistence in the context of Taiwanese higher education and casts light on how well students integrate into a particular institution in the freshmen year. While the focus of this research was on the impact of financial aid availability on students' persistence toward a degree, their precollege academic performance, academic integration, and social aspiration as well as parental support were included as important influences in the journey toward college completion. Government and higher education institutions, which play a pivotal role in ensuring that educational opportunities are made accessible to low-income and disadvantaged students, may benefit from the insights provided into the complex interplay between financial considerations and other factors in the college experience as these affect student persistence decisions.

The procedures for estimating student persistence developed for the current study yielded mixed results. Eight of the eleven factors were related to student persistence decisions. In particular, precollege academic performance, campus work, and academic integration were ranked as the top three by far in terms of total effects on student persistence behaviors, although precollege academic performance was found to have negatively significant effects on students' continued enrollment. This counter-intuitive finding might indicate that there was enough disconnect between high school preparation and college academics to significantly reduce the relevance of precollege academic performance to postsecondary persistence. It might further be inferred that the perceived value of a college degree resulted in stronger efforts to counteract previous academic problems and a greater commitment to finish college. This also can explain the nonsignificant effects of parents' educational attainment on student persistence behaviors. In addition, the negatively significant effects of campus work (-.17) on student persistence behaviors indicated that the more hours students were working either on-campus or off-campus, the higher the risk for dropping out. Researchers have found that more than a half of college students had jobs that were irrelevant to their majors (Chou, 2007; Yang & Chen, 2009). However, campus work had positive effects on academic integration (.06) in the model, suggesting that it enhances persistence by helping students integrate into the campus environment. Furthermore, campus work was directly affected by financial aid (.35), and the rewarding of financial aid had positively significant effects on persistence decisions (.03).

The construct of social aspiration had either direct or indirect positive effects on students' initial institutional commitments (.10), parental support and encouragement (.19), academic integration (.04), faculty-student interactions (.04), peer relations (.14), practical value for future employment (.19), and the composite of student academic intensity (.12). It embodies the belief that earning a college degree is essential for enhancing an individual's long-term social and economic benefits. This notion, which has taken hold in society, is generally endorsed by students and their families. Parental support has a major positive influence on how students, particularly those in the traditional age population, interact with their peers and campus environments. Although initial institutional commitment was not significantly related to student persistence, it had mediating effects on parental support (.20), academic integration (.17), faculty-student interaction (.11), and practical value for future employment (.05). Faculty-student interaction was negatively related to practical value for future employment, and also unrelated to student persistence decisions. Peer relations were also found to have nonsignificant effects on student enrollment decisions, but they exerted directly significant effects on practical value for future

employment (.12), suggesting that the energy and time students invest in social interactions with their peers directly influence the degree to which they understand the economic benefits of higher education in their careers after graduation (.12).

Lastly, counter to expectations, the effects of the construct of practical value for future employment were found to be nonsignificant in the model (-.03), indicating that students who were more likely to finish college did so not only for vocational purposes. This finding may be attributed to the intrinsic value placed on education in Taiwan, particularly the emphasis on high academic performance (Wu, 2011). Such a notion is reinforced by values throughout the larger Asian society. Also, as the focus of higher education policy in Taiwan has shifted from elite to mass education, there is less connection between college graduation and specific employment advantages. While a college degree is becoming a prerequisite before entering the job market in most Asian societies, it is not a guarantee (Altbach et al., 2005). Given these cultural and economic factors, the differences in results between the present and previous studies suggest the need for a new model for assessing student persistence that is more reflective of Asian cultures and values.

6. Policy Implications

Although the expansion of Taiwanese higher education has resulted in major improvements in student access, there is growing concern about college affordability (Chou, 2007; Lin, 2008; Hung & Cheng, 2009). While the burden of paying for college costs has increasingly fallen on students and their families, the growing access to higher education has depended significantly on the rise of private postsecondary institutions, in which a majority of low-income students are enrolled. Given this circumstance, financial aid policies over the last decade have emphasized ways to keep college affordable and enhance student persistence. The findings of this study confirm the important role of financial aid in the enrollment decisions of undergraduate freshmen and of government need-based aid as financial support for low-income students, equalizing educational opportunities between low- and high- income families and promoting student persistence.

Nevertheless, the issues of keeping college affordable and closing the educational disparities between low- and high- income students remain a major concern in Taiwanese higher education. Currently, aid in the form of loans is becoming popular for first-time freshmen, who must complete the first semester to be eligible for grant-aid. Also, in light of the impact of the global economic recession, students with financial constraints have a greater need to work either on- or off-campus while in college, suggesting the inadequacy of aid, which could result in reduced study time and burnout that further deteriorate the quality of college education (Wu, 2011). While students leave for a variety of reasons, which have the potential to erode educational equity and result in the deflation of achievement of college credentials, helping low-income students deal with costs is one area in which public policy must play a role. With steadily rising higher educational costs and growing debt burdens, public and institutional financial aid policies should be carefully crafted and combined with significant increases in ongoing support efforts. For example, the government may better direct scarce financial resources toward lower- and lower-middle income students by deliberately defining the eligibility criteria for student financial aid and increasing the transparency of the student financial aid process (Advisory Committee on Student Financial Assistance, 2005).

Care should be taken not to overgeneralize the results of the present study. More research is needed for policy makers and institutional leaders to have an improved understanding of student departure behaviors and how students value different components of financial aid packages and what tradeoffs they would consider in making changes in their aid packages. As mentioned throughout, the direct and indirect effects of students' college experiences on reducing the likelihood of departure revealed evidence that what happens in college does make a difference, and the various types of institutions may vary in their academic and social contexts and therefore provide different college experiences for students. Hence, policy design and implementation should be empirically data-driven to adequately inform policy-makers and institutional leaders as they pursue the goals of both social justice and educational equity in higher education.

References

Advisory Committee on Student Financial Assistance. (2005). *Empty promises: The myth of college access in America*. Washington, D. C.

Altbach, P. G., Berdahl, R. O., & Gumport, P. J. (2005). American higher education in the twenty- first century: Social, political, & economic challenges. The John Hopkins University Press. http://dx.doi.org/10.5860/choice.37-0444

Bean, J. (1980). Dropouts & turnover: The synthesis & test of a causal model of student attrition. Research in

Higher Education, 12(2), 155-187. http://dx.doi.org/10.1007/bf00976194

Bean, J. (1982). Conceptual models of student attrition: How theory can help the institutional researcher. In E. T. Pascarella (Ed.), *New Directions for Institutional Research: Studying Student Attrition* (Vol. 36, pp. 17-33). San Francisco: Jossey-Bass. http://dx.doi.org/10.1002/ir.37019823604

Bean, J. (1983). The application of a model of turnover in work organization. *The Review of Higher Education, 6*, 129-148. http://dx.doi.org/10.5353/th_b3124796

Bean, J. (1985a). Interaction effects based on class level in an explanatory model of college student dropout syndrome. *American Educational Research Journal, 22*(1), 35-64. http://dx.doi.org/10.3102/00028312022001035

Bean, J. (1990). Why students leave: Insights from research. In D. Hossler, & J. Bean (Eds.), *The Strategic of Management of College Enrollments*. Jossey-Bass: San Francisco.

Bean, J., & Metzner, B. S. (1985b). The estimations of a conceptual model of nontraditional undergraduate student attrition. *Review in Higher Education, 27*(1), 15-38.

Bollen, K. A. (1989). *Structural equations with latent variables*. John Wiley & Sons, Inc. http://dx.doi.org/10.1002/9781118619179

Braxton, J. M., & Hirschy, A. (2004). Modifying Tinto's theory of college student departure using constructs derived from inductive theory revision. In M. Yorke, & B. Longden (Eds.), *Retention & student success in higher education*. Buckingham, UK: Open University Press.

Braxton, J. M., & McClendon, S. A. (2001-2002). The fostering of school integration & retention through institutional practice. *Journal of College Student Retention, 3*(1), 57-71. http://dx.doi.org/10.2190/RGXJ-U08C-06VB-JK7D

Braxton, J. M., Hirschy, A. S., & McClendon, S. A. (2004). *Understanding & reducing college student departure*. San Francisco, CA: Jossey-Bass. http://dx.doi.org/10.1353/csd.2005.0016

Braxton, J. M., Sullivan, A. S., & Johnson, R. M. (1997). Appraising Tinto's theory of college student departure. *Higher Education: Handbook of theory & research, 12*, 107-164.

Braxton, J. M., Vesper, N., & Hossler, D. (1995). Expectations for college & student persistence. *Research in Higher Education, 36*(5), 595-612. http://dx.doi.org/10.1007/bf02208833

Cellini, S. R. (2008). Causal inference and omitted variable bias in financial aid research: Assessing solutions. *Review of Higher Education, 31*, 329-354. http://dx.doi.org/10.1353/rhe.2008.0010

Chou, C. P. (2007). The study of educational expenses on college students in Taiwan. *Journal of Education Research*, 154. Retrieved from http://www3.nccu.edu.tw/~iaezcpc/C-%20except%20the%20charge%20ofeducation.htm

Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (3rd ed.). Pearson Education, Inc.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. University of Nebraska-Lincoln: Sage Publications, Inc.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, A. E. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Hoyle, R. H. (1995). The structural equation modeling approach: Basic concepts and fundamental issues. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 1-15). Thousand Oaks, CA: Sage.

Kim, J., DesJardins, S. L., & McCall, B. P. (2009). Exploring the effects of student expectations about financial aid on postsecondary choice: A focus on income & racial/ethnic differences. *Research in Higher Education, 50*, 741-774. http://dx.doi.org/10.1007/s11162-009-9143-x

Lin, H.-F. (2008). *Research on related factors affecting the dropouts or persistence of technical college students: An example of students from technical colleges in Taipei area*. National Taiwan Normal University, Taipei.

Ministry of Education. (2008a). *Important statistical information about higher education costs*. Department of Statistics. Retrieved September 13, 2012, from http://www.edu.tw/statistics/content.aspx?site_content_sn=8956

Ministry of Education. (2008b). *2008 Educational statistical indicators*. Retrieved August 25, 2012, from http://english.moe.gov.tw/lp.asp?ctNode=816&CtUnit=507&BaseDSD=7&mp=1

Ministry of Education. (2009b). *Introduction to Higher Education in Taiwan*. Taipei, Taiwan.

Ministry of Education. (2013). *Reports of Educational statistics in Taiwan*. Department of Statics, Ministry of Education, Taiwan.

Ministry of the Interior. (2009a). *1996-2008 The trend of tuition & fees in public & private institutions in Taiwan*. Retrieved June 30, 2010, from http://www.moi.gov.tw/

Mok, K. (2000). Reflecting globalization effects on local policy: higher education reform in Taiwan. *Education Policy, 15*(6), 637-660. http://dx.doi.org/10.1080/02680930010000236

Pascarella, E. T., & Terenzini, P. (1980). Toward the validation of Tinto's model of college student attrition: A review of recent studies. *Research in Higher Education, 12*(3), 271-282. http://dx.doi.org/10.1007/bf00976097

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research*. San Francisco, CA: Jossey- Bass.

Pike, G. R., Smart, J. C., & Ethington, C. A. (2012). The mediating effects of student engagement on the relationships between academic disciplines and learning outcomes: An extension of Holland's theory. *The Research in Higher Education, 53*(5), 550-575. http://dx.doi.org/10.1007/s11162-011-9239-y

St. John, E. P. (1992). Workable models for institutional research on the impact of student financial aid. *The Journal of Student Financial Aid, 22*(3), 13-26.

St. John, E. P., Hu, S., & Tuttle, T. (2000). Persistence by undergraduates in an urban public university: Understanding the effects of financial aid. *The Journal of Student Financial Aid, 30*(2), 23-37.

St. John, E. P., Paulsen, M. B., & Carter, D. F. (2005). Diversity, college costs, & postsecondary opportunity: An examination of the financial nexus between college choice & persistence for African Americans & Whites. *The Journal of Higher Education, 76*(5), 545-569. http://dx.doi.org/10.1353/jhe.2005.0035

Stage, F. K., & Hossler, D. (1989). Difference in family influences on college attendance plans for male & female ninth graders. *Research in Higher Education, 30*(3), 301-315. http://dx.doi.org/10.1007/bf00992606

Tai, H. H. (2008). Government failure & market failure: An anatomy of taiwan's university tuition policy & its problems. *Higher Education, 3*(1), 81-128.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*(1), 89-125. http://dx.doi.org/10.3102/00346543045001089

Tinto, V. (1993). *Leaving College: Rethinking the causes & cures of student attrition* (2nd ed.). Chicago, IL: University of Chicago Press.

Wu, C. C. (2011). High graduate unemployment rate & Taiwanese undergraduate education. *International Journal of Education Development, 31*, 303-310. http://dx.doi.org/10.1016/j.ijedudev.2010.06.010

Wu, M. L. (2009). *Structural equation modeling: The application of SIMPLIS* (3rd ed.). Taipei: Wu-Nan Publication. http://dx.doi.org/10.4324/9780203774762

Yang, C. C., & Chen, S. Y. (2009). *Tuition & finances in higher education in Taiwan*. Retrieved June 20, 2010 from the Center of Integrated Higher Education Database System in Taiwan.