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Exploring the factors of pursuing a master's degree in South Korea

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Abstract
The aim of this study is to explore the various factors involved in pursuing a master's degree for university graduates in South Korea. After reviewing theoretical frameworks, including human and social capital theories, an analytical model was constructed to examine the different academic and economic factors involved in pursuing a master's degree, considering different institutional backgrounds. The data used were collected from the Graduates Occupational Mobility Survey conducted by the Korean Employment Information Service. We obtained the data from 11,960 respondents who graduated from university in 2013. Descriptive statistics and logistics regression were used in the analysis. The results show that gender, age and family socioeconomic status affected students' decision to pursue a master's degree. In addition, academic background factors, such as discipline, satisfaction with undergraduate study and intrinsic motivation for the choice of major, had positive effects on enrolment in master's degrees. However, active participation in the job search process during undergraduate study had negative effects on the decision. Students in research universities in major cities were more likely to pursue a master's degree than those in teaching-oriented universities in local provinces. This study has implications for the motivations, demands and career paths of postgraduate students taking master's degrees.

Keywords Master's degree · University graduates · Academic motivation · Economic motivation · South Korea

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Introduction

Master's education is changing rapidly worldwide, and the number of students, the diversity of programmes and the modes of delivery are increasing. In the USA, the number of master's degree programmes increased by 150% between 1971 and 2005 (Committee on Enhancing the Master's degree in the Natural Sciences 2008). Similarly, in Australia, enrolment in master's degrees increased by 199% between 1993 and 2003 (Edwards 2011). About 28% of all degrees awarded in the UK are at master's or other postgraduate levels (Drennan 2012). This trend is also found in the Asian context. The eight public universities in Hong Kong offer almost 500 taught master's programmes in total.

Studies of higher education have focused on bachelor's and doctoral education, with less emphasis on master's students or their motivations to pursue studies and their learning experiences and career paths. Obtaining exact figures on master's programmes and students is difficult due to their diversity, even within a single university (Monk and Foote 2015). However, as Glazer-Raymo (2005, p. 3) noted, a master's degree is 'a pivotal degree that bridges the bachelor, the doctorate, and the work place' and 'has the capacity to continually evolve as a highly adaptable and affordable credential'.

Why are applications for master's programmes increasing? One explanation is based on economics. As economies develop, the need for more skilled, knowledgeable and professional workers increases (Syverson 1996), and an advanced degree such as a master's is expected to develop higher levels of knowledge and skills than undergraduate education (O'Donnell et al. 2009). The increase in applications is also closely related to labour market conditions. For example, in many advanced countries, most students have a bachelor's degree, and so master's degrees can represent further social credentials that can improve the job prospects of university graduates (Van de Werfhorst and Anderson 2005). Wright and Horta (2018) explained that expansion of higher education has brought the uncertainty over graduate employment outcomes and students seek higher credential for their labour market entry. This pattern is even stronger in high income countries. In addition, a higher level of education is sought after in certain professional occupations, such as education and health sciences, in which a master's degree is required for entry-level positions or promotions in many countries (Syverson 1996). Another explanation for the increase is related to the nature of higher education. The overall growth of higher education has led to more opportunities in terms of faculty positions and doctoral education, and a master's degree is the first step to access doctoral programmes. The growth of higher education has also increased the number of research assistants and teaching assistants required in universities, which are positions generally held by master's degree graduates (Conrad et al. 1993). Master's programmes are also the main source of income and reputation enhancement for universities (Conrad et al. 1993; Edirisinghe and Fraser 2015).

Despite the growing importance of master's education for individuals and institutions, current master's programmes have very little standardisation in terms of admission criteria, graduation requirements and degree titles. Thus, a structured and comprehensive approach is required to understand students' demands in master's programmes and to increase opportunities for learning and career advancement at institutional and programme levels.

Most studies of master's education have focused on individual programmes, such as Master of Business Administration, teacher education and nursing programmes, or on specific institutions (Nerad and Miller 1996; Poock and Love 2001). This focus stems from the assumption that master's education is a self-regulating programme in each institution and thus

that the learning outcomes are only relevant to individual disciplines and departments (Bilder and Conrad 1996). In addition, most research is comprised of qualitative studies (Austin 2002; Golde and Dore 2001; Wulff et al. 2004) and offers little empirical evidence documenting students' experiences or success on a large scale (Kniola et al. 2012).

This study focuses on master's students in Korea, where there has been a significant increase in master's education over the last 30 years and explores the factors that influence students who pursue master's degrees. The research questions are as follows.

- What are the individual factors and family backgrounds of students pursuing master's degrees?
- How do students' academic backgrounds and job prospects affect their pursuit of a master's degree?
- How do students' disciplinary and institutional backgrounds affect their pursuit of a master's degree?

Korea has experienced a rapid massification of higher education since 1980, and the demand for postgraduate study has also risen over time (Jung 2018a, 2018b). This clearly reflects the global trend in master's education, as the rapid expansion of higher education has led to greater competition for university graduates, and a master's degree is increasingly seen as a necessary credential for employability in local job markets (Waters 2009). Thus, identifying the key factors in pursuing a master's degree based on the Korean case is significant for postgraduate study worldwide. The focus of this study is on students' perspectives, particularly with regard to the demographic, academic and employment factors leading them to pursue master's degrees, and the findings have implications for the development of postgraduate education and for the better understanding of students' expectations. At the institutional level, the findings can inform strategies for establishing programmes, advising and mentoring, redesigning curricular offerings and improving delivery modes.

The Korean context

The nature and purpose of master's education vary with location, and thus, it is important to examine master's education in a specific higher education context. In Korea, master's education has expanded rapidly since the 1980s, changing the nature of both the degrees and the programmes. Youn (2015) described the developmental stages of master's education in Korea as establishment (1946–1965), stabilisation (1966–1990) and expansion and development (1991–2005). In the first stage, a few graduate schools were legally established, which were mainly research universities and programmes focusing on law, engineering, education, business and economy. The main aim in this stage was to train university teachers and thus meet the growing demand for higher education. Due to the lack of human resources at advanced levels, academics hired as university teachers were only required to hold a master's degree during this period (Jung 2018a; Shin et al. 2016). From 1966 to 1990, master's programmes increased in number, and special programmes in fields such as education were created to offer certificates in specific vocations. After 1991, regulations and laws were strengthened to control the quality of postgraduate education. Professional graduate schools were also established in other fields, such as law and medicine. Currently, master's education in Korea is divided into general, special and professional areas.

Table 1 shows the increase in the number of master's students in Korea. This increase was greater than that of undergraduates. From 1970 to 2012, the number of undergraduate students increased from 140,000 to 2,100,000 (15 times), while the number of graduate students increased from 66,000 to 329,000 (49 times). In 2000, the number of master's degrees awarded was 47,226 and increased to 82,805 in 2014 (an increase of 75.3%).

From the awarding of the first master's degree in 1947 until 1980, master's education played a key role as a stepping stone to further PhD education. Interestingly, in the aftermath of the 1997 economic crisis, master's education significantly expanded, similar to the expansion of postgraduate schools that was a replacement for employment. Since the late 1990s, the number of part-time students has increased, with many enrolling in programmes to improve their educational level and increase their career mobility opportunities (Youn 2015).

The changing goals of students pursuing master's education are also significant. According to a 2013 survey conducted by the national newspaper *Career*, the main reason for participants to start a master's programme was to improve their credentials in the labour market (35.9%). The second most important reason was academic interest (34.2%), whereas other responses, such as 'difficulties in finding a job' or 'no intention to work', accounted for 26.3%. Among graduates of general master's programmes, 67.2% obtained work after their degree, with only 7% of graduates pursuing PhDs (Youn 2015).

As Uhm (2011) suggested, master's education in Korea has improved in its capacity as a research system combined with PhD education and based on government research funds, but it has failed to meet the new demands of the labour market or to provide non-academic career guidance for students. Indeed, many universities do not have differentiated master's programmes and services, and many companies do not distinguish between undergraduate and master's degree holders. In addition, although some major research universities offer scholarship opportunities, most programmes are self-funded.

Factors involved in pursuing a master's degree: theoretical framework

Different variables associated with pursuing higher education, including master's and doctoral education, have been explored to construct the variables in present study. They include individual characteristics of students, major and previous education experiences and institutional characteristics. Although specific professions such as medical science in some countries require a master's degree, (Morelon-Quainoo et al. 2009), these factors can in general affect students' decisions to pursue a master's degree.

First, demographic characteristics such as gender, age and marital status can affect students' choices. For example, it has been suggested that male students are more likely than female students

Table 1 The number of master's students in Korea (2000–2014)

	Total	General	Professional/special graduate schools
2014	82,805	32,611	50,194
2010	77,328	29,514	47,814
2005	68,439	27,654	40,785
2000	47,226	25,407	21,819

Data Source: KEDI (2000-2014), Statistical Yearbook of Education. Jincheon: Korean Educational Development Institute

to choose to pursue a master's degree (Hearn 1987; Paulsen and Pascarella 2016; Weiler 1991). However, Perna (2004) found that more female students enrolled in master's degrees, whereas more male students enrolled in doctoral programmes.

Second, previous academic experiences at the undergraduate level are important and can for example affect the choice of major in the master's level. In general, more students in the natural science field continue their studies at the postgraduate level than students in other fields (Hirt and Mufflo 1996). Academic achievement, such as grade point average (GPA), positively affects postgraduate enrolment decisions (Fox 1992; Heller 2001; Millett 2003). Students who participated in research projects during their undergraduate study tend to enrol in postgraduate programmes (Boylan 2009, cited in Kniola et al. 2012). In addition, the more satisfying the campus experience, including interactions with faculty members or high teaching quality during undergraduate study, the more positive students are about continuing their education (Hartman and Schmidt 1995; Paulsen and Pascarella 2016).

Third, economic factors must be considered, particularly in terms of job prospects. According to the human capital theory, students choose to continue their studies to improve their capital and gain extra credentials for the labour market (Becker 1962; Paulsen and Toutkoushian 2008). People with a master's degree are expected to have higher levels of knowledge and skills than undergraduate students, leading to higher wages (Thomas and Perna 2004). Thus, this study included variables such as working experience or job preparation activities of students to see whether these economic activities matter for students' decision. This is particularly important in Korean context. In Korea, universal access to higher education was achieved in the late 1990s, and many university graduates have made efforts to gain extra certificates in the labour market. Obtaining an advanced degree is one of the strategies used to enhance their human capital (Jung and Lee 2016). Thus, this study considered economic factors in the analytical model, particularly in terms of job prospects of current students.

Human capital theory provides a valuable framework for explaining the reasons for pursuing an advanced degree. However, this framework does not consider internal dimensions, including individual socioeconomic backgrounds, personal characteristics and academic abilities. In this context, Perna's (2004) recent work included cultural and social capital concepts to explain the determinants of master's degrees. For example, the amount of cultural capital possessed by individuals, such as language, cultural activities and preferences, influences their choice of postgraduate education (Dumais 2002; Perna 2006). Individuals also choose to pursue their studies to expand their social connections and resources, as this network can be enhanced through postgraduate study. Participation in organisational networks, such as reputable alumni associations and social activities, help individuals to access useful information (Useem and Karabel 1986). In the Korean context, there has been a lack of analysis of the expansion of postgraduate education, although theoretical frameworks have helped to explain the increasing demand for master's education in recent years. For example, several studies have discussed the increase of educational expenditure in the Korean educational context, in terms of economic and social capital (Hultberg et al. 2017; Kim and Lim 2012; Lee and Brinton 1996) although they focus on access at the undergraduate rather than the postgraduate level.

To consider students' social and cultural capital in the model, this study included parent's economic and educational backgrounds. According to previous studies, students' social backgrounds affect their decision to obtain another degree, such as their parents' socioeconomic status, while their financial condition influences the graduate school choice process.

There is also a positive relationship between the socioeconomic status of a student's parents and the student's pursuit of master's education. The higher the education level of the parents and the higher their income, the more likely a student is to pursue postgraduate education (Millett 2003; Paulsen and Pascarella 2016). Based on these arguments, Kniola et al. (2012) pointed out that graduate students from families with lower socioeconomic status often experience a cultural mismatch beyond the required research tasks. Students' financial conditions are also important, as their level of debt and student loans influence their decision to pursue postgraduate education, although the findings on this are not consistent (Millett 2003).

Finally, institutional backgrounds are important because institutional reputation that they attend for education is one of the most important social and cultural capitals. For example, students from private universities in the USA are more likely to pursue postgraduate education than those from public universities (Paulsen and Pascarella 2016). The location of the chosen institution is also significant for students who want to have educational experiences in a new or in a familiar environment (Perna 2004). In addition, institutional reputation affects students' decision making. Haworth and Conrad (1997) showed that many students considered institutional reputation when choosing postgraduate education, so they could improve their credentials at their master's institutions compared with their undergraduate institutions. Thus, research universities are often more popular than other types of institutions for prospective master's students.

Methodology

Data

The data used in this study were obtained from the Graduates Occupational Mobility Survey (GOMS) in Korea. The GOMS has been conducted by the Korean Employment Information Service since 2006. As the largest cross-sectional survey of a representative sample of university graduates in Korea, it provides extensive information on graduates' educational experiences, their job searching process and their labour market behaviour. The sample includes 4% of all 4-year university graduates and 2- to 3-year community college graduates in Korea (the details of the survey procedure are available at https://survey.keis.or.kr/goms/goms01.jsp).

We selected the data from 18,160 respondents who graduated from four-year universities in 2013. We excluded responses from medical science graduates because of the unique design of their postgraduate study programmes. We further eliminated 174 respondents who studied in integrated master's and doctorate programmes and 56 respondents who did not clearly answer the question about the level of their postgraduate degree (e.g. master's or doctorate). The final sample size was 11,960.

Variables and measures

To examine the factors affecting university graduates' decision to pursue a master's degree, we constructed the analytical variables as follows. The dependent variable was 'enrolment in a Master's programme or not within two years of graduation' and was coded as a dummy variable (yes = 1, no = 0).

The independent variables were separated into five categories: individual characteristics, academic background, job preparation, discipline and institutional characteristics, following

previous studies. First, individual characteristics, such as gender and age, were used in the model as control variables. Family socioeconomic status was included as an important independent variable and individual characteristic to examine how graduates' family status influenced their decision to obtain an advanced degree after their undergraduate study. Social status was measured based on the father's educational level (having a Bachelor's degree or above, or not), and economic status was measured by monthly family income, according to the average household income (Korean Statistical Information Service 2014). In addition, we included a variable of their student loans during their undergraduate study to establish whether financial burden has an impact on students' decision-making when pursuing a master's degree. This was measured by the open question 'What is the total amount of your student loan?' and transformed into log form to adjust for skewed distribution.

Second, graduates' academic backgrounds were included in the analysis. Graduates' average GPA was converted into 100 points and considered as one of the aspects of academic achievement. In addition, the intrinsic and extrinsic motivations of students in choosing a specific major were considered, to examine how these motivations affected students' decisions to continue their studies, and were coded as dummy variables. Intrinsic motivations (coded as 1) were measured by academic interest or aptitude, depending on the graduates' main reasons for choosing a major. Extrinsic motivations (coded as 0) were measured based on external reasons, such as job prospects, social reputation or recommendation from parents, teachers and friends. Finally, students' overall satisfaction with their major was examined and measured on a 5-point Likert scale ranging from '1' (not at all) to '3' (neutral) and to '5' (very satisfied).

The third category of independent variable was job preparation. Whether students who had more exposure to job preparation sought to obtain another degree after graduation or not was examined, as pursuing a master's degree is often related to the job search process of graduates. In the job preparation variable, internship experience (yes = 1, no = 0) and participation in various job preparation activities, such as career-related courses, job fairs or career consultations (yes = 1, no = 0), were included in the analysis.

Fourth, the discipline variable was divided into humanities, social science, education, engineering, natural science and the arts. The humanities discipline was used as a criterion variable to construct the dummy variables.

Fifth, institutional characteristics, such as university prestige, institutional types and location, were examined. University prestige was classified into research university I (12), research university II (16), research-teaching university (30) and teaching university (74). This classification was set up in 2005 by the Korean Ministry of Education (MOE) as a part of the policy reform aimed at providing the higher education sector with a strategic mission classification. The classification aimed to identify the strengths of each institution and to enable them to focus on their resource distribution in the key mission areas of teaching or research and undergraduate or postgraduate. It also considered what their strengths were in terms of disciplines and the locations of the universities, so they could develop strong curriculums based on social and industrial demands and thus improve national competitiveness as a whole. The classification drew on the Carnegie model and was based on the number of publications, the number of PhD students and the scale of government funds (MOE 2005). The classification has a broad coverage for all 4 years universities, and it is linked to institutional prestige. For example, the top universities in Korea in terms of reputation were included in the research university I category. Institutional types were divided into public and private universities, while location was divided into Seoul and Gyeonggi (capital and major cities) and other provinces. Table 2 presents the details of the variables used in the study.

Table 2 Variables

Variables		Measurement
• Independent variables		
Individual characteristics	Gender	Male = 1, female = 0
	Age	2014—birth year
	Father's education	Father having a bachelor's degree or above = 1
		Secondary school and below = 0
	Monthly family income	KRW4 million (US$3,600) and over = 1
		Under KRW4 million (US$3,600) = 0
	Student loan	Total amount of student loans (Ln form)
Academic backgrounds	College GPA	GPA (conversion to 100 points)
	Motivations for major selection	Intrinsic factors (academic interest or aptitude) = 1
		Extrinsic factors (job prospects or social reputation or recommendation from parents, teachers or friends) = 0
	Major satisfaction	Overall major satisfaction on a 5-point Likert scale
Job preparation	Internship experience	Yes = 1, no = 0
	Participation in any type of job preparation activity	Participation in any type of job preparation activity (career-related courses, job fairs, career consultations, etc.) = 1, No = 0
Discipline	Majors	Social science, education, engineering, natural science, arts, humanities (criterion variable)
Institutional characteristics	University prestige	Research university I
		Research university II
		Research-teaching university
		Teaching university (criterion variable)
	Institutional types	Public university = 1, private university = 0
	Location	Seoul and Gyeonggi = 1, other provinces = 0
• Dependent variables		
Enrolment in a master's programme		Enrolment in a master's programme = 1, no = 0

Analytical methods

This study used two methods of statistical analysis. For descriptive purposes, Pearson's chi-squared test (Pearson χ^2) and the *t* test were used to observe whether the independent variables differed based on graduates' enrolment in a master's programme. Second, a logistic regression was conducted to analyse the factors involved in pursuing a master's degree. The analytical model was as follows.

Participation in master programme = f [(individual characteristics, academic backgrounds, job preparation, discipline, institutional characteristics)].

Results

Descriptive statistics

Table 3 presents the descriptive statistics of the sample. In terms of demographic backgrounds, the number of male respondents was 6,410 (53.6%) and the number of female respondents 5,550 (46.4%). The average age was 26.90. Fewer than half of the graduates (5,437; 47.3%) reported that their father's educational level was higher than a Bachelor's degree. The family

Table 3 Descriptive statistics

Variables			No	Percent	
Gender	Male		6,410	53.6	
	Female		5,550	46.4	
Father's education	Bachelor's degree and beyond		5,437	47.3	
	Secondary school and below		6,061	52.7	
Monthly family income	KRW4 million and over		4,757	40.1	
	Under KRW4 million		7,108	59.9	
Motivations for major selection	Intrinsic motivations		6,016	50.6	
	Extrinsic motivations		5,881	49.4	
Internship experience	Yes		2,660	22.2	
	No		9,300	77.8	
Participation in various job preparation activities	Yes		8,756	73.2	
	No		3,204	26.8	
Discipline	Humanities		1,752	14.6	
	Social Science		2,374	19.8	
	Education		1,307	10.9	
	Engineering		3,215	26.9	
	Natural science		1,766	14.8	
	Arts		1,546	12.9	
University prestige	Research university I		1,637	13.7	
	Research university II		2,407	20.1	
	Research-teaching university		2,702	22.6	
	Teaching university		5,214	43.6	
Institutional types	Public university		3,191	29.2	
	Private university		8,469	70.8	
Location	Seoul and Gyeonggi		5,696	47.6	
	Other provinces		6,264	52.4	
Enrolment in a master's programme	Yes		1,599	13.4	
	No		10,361	86.6	
	N	Mean	SD	Max	Min
Age	11,960	26.90	3.59	69.80	22.10
Student loan (10,000 won)	11,795	411.35	828.67	12,000	0.00
College GPA	11,558	81.73	8.53	100.00	37.78
Major satisfaction	11,960	3.58	0.85	5.00	1.00

income of 4,757 (40.1%) students was above the average household income. However, 3,581 (29.9%) students took out a loan to complete their Bachelor's degree, and on average, the total amount of student loans is 4,113,513 won (approximately US$3,871).

The descriptive analysis also presents the academic backgrounds of the respondents. Their average GPA (converted to 100 points) was 81.73. In addition, 6,016 (50.6%) graduates responded that they chose their major based on intrinsic motivations, whereas 5,881 (49.4%) graduates said that external factors were more important when they decided on a major. The overall satisfaction level of respondents with their major was 3.58.

The respondents also showed different levels of participation in job preparation activities. Of the respondents, 2,660 (22.2%) had participated in internships during undergraduate study and 8,756 (73.2%) had participated in different types of job preparation activities.

The distribution by discipline was as follows: 14.6% in the humanities, 19.8% in social science, 10.9% in education, 26.9% in engineering, 14.8% in natural science and 12.9% in the arts. In the sample, 1,637 (13.7%) respondents graduated from universities in the category of research university I, 2,407 (20.1%) from universities in the category of research university II, 2,702 (22.6%) from research-teaching universities and 5,214 (43.6%) from teaching universities.

Among this sample, 1599 (13.4%) graduates enrolled in master's programmes.

In the following descriptive analysis, we focused on the characteristics of graduates enrolled in master's programmes. The study used Pearson's chi-squared test (Pearson χ^2) to examine whether the level of enrolment in a master's programme differed based on individual characteristics, academic backgrounds, job preparation, discipline and institutional characteristics. As shown in Table 4, a slightly higher number of male students (14%) than female students (12.7%) enrolled in master's programmes. The father's educational background was also important. Of the respondents, 892 (16.4%) whose fathers had a tertiary education degree or above enrolled in a master's degree programme, compared with 656 (10.8%) respondents whose fathers' education levels were secondary or below. A similar result was obtained for family income. More students with above-average monthly family incomes enrolled in a master's programme than those with lower monthly family incomes (15.4% vs. 11.9%).

Similar differences were also found in terms of academic backgrounds. Graduates who chose their majors based on intrinsic motivations were more inclined to enrol in a master's programme than those who chose their majors based on extrinsic motivations (15.9% vs. 10.8%). Graduates' participation in job preparation activities also affected their choice of master's degree programme. For example, graduates with internship experience were less likely to enrol in a master's programme than those with no internship experience (11.0% vs. 14.0%). The same result was found for participation in various job search activities.

In terms of discipline, natural science (22.9%) and humanities (15.0%) graduates were more likely to enrol in master's degree programmes than social science (5.8%) or education

Table 4 Descriptive statistics based on enrolment in a master's programme

Variables		Enrolment in a master's programme		Pearson χ^2
		Yes	No	
Gender	Male	897 (14.0%)	5,513 (86.0%)	4.647*
	Female	702 (12.7%)	4,848 (87.4%)	
Father's education	Bachelor's degree and beyond	892 (16.4%)	4,545 (83.6%)	76.672***
	Secondary school and below	656 (10.8%)	5,405 (89.3%)	
Monthly family income	KRW4 million and over	732 (15.4%)	4,025 (84.6%)	29.260***
	Under KRW4 million	849 (11.9%)	6,259 (88.1%)	
Motivations for major selection	Intrinsic factors	958 (15.9%)	5,058 (84.1%)	68.369***
	Extrinsic factors	633 (10.8%)	5,248 (89.2%)	
Internship experience	Yes	292 (11.0%)	2,368 (89.0%)	16.901***
	No	1,307 (14.1%)	7,993 (86.0%)	
Participation in various job preparation activities	Yes	1,102 (12.6%)	7,654 (87.4%)	17.342***
	No	497 (15.5%)	2,707 (84.5%)	
Discipline	Humanities	263 (15.0%)	1,489 (85.0%)	297.081***
	Social science	137 (5.8%)	2,237 (94.2%)	
	Education	106 (8.1%)	1,201 (91.9%)	
	Engineering	474 (14.7%)	2,741 (85.3%)	
	Natural science	404 (22.9%)	1,362 (77.1%)	
	Arts	215 (13.9%)	1,331 (86.1%)	
University prestige	Research university I	383 (23.4%)	1,254 (76.6%)	225.443***
	Research university II	387 (16.1%)	2,020 (83.9%)	
	Research-teaching university	330 (12.2%)	2,372 (87.8%)	
	Teaching university	499 (9.6%)	4,715 (90.4%)	
Location	Seoul and Gyeonggi	933 (16.4%)	4,763 (83.6%)	85.093***
	Other provinces	666 (10.6%)	5,598 (89.4%)	

Table 5 The effect of students' satisfaction with their major on enrolment in master's programmes

Master's programme	Number	Mean	SD	*T* test
Enrolment	1,599	3.684	0.859	− 5.407***
No enrolment	10,361	3.560	0.850	
Total	11,960	3.577	0.852	

(8.1%) graduates. In addition, more graduates from research-intensive universities (23.4%) enrolled in master's programmes than those from teaching-oriented universities (9.6%).

We also conducted a *t* test to examine if academic background affected whether students enrolled in master's degree programmes, such as whether they were satisfied with their major or their level of academic achievement, as measured by their average GPA. Tables 5 and 6 present the results of the *t* test. For example, more graduates who were satisfied with their major enrolled in master's programmes than those who were less satisfied with their major. In addition, graduates with higher academic achievements were more likely to enrol in master's programmes than those with lower academic achievements. The differences were statistically significant.

We used a logistic regression to examine the factors influencing Korean university graduates in pursuing master's degrees. The model fit was explained by maximum likelihood estimation, and the likelihood ratio (LR) χ^2 of this model was statistically significant (LR $\chi^2 = 846.35$***). The model was correctly specified by the Hosmer–Lemeshow goodness of fit test (Hosmer–Lemeshow $\chi^2(8) = 13.94$, Prob > $\chi^2 = 0.0834$). As shown in Table 7, gender, age, father's educational level and monthly family income had statistically significant effects on pursuing a master's degree. More male graduates enrolled in master's programmes than female graduates. More younger students enrolled than older students. More graduates with high family socioeconomic status (SES), including a highly educated father and high family income, enrolled in master's programmes than graduates with lower family SES. However, student loan was not a significant factor in pursuing a master's degree.

Academic backgrounds were also important. For example, graduates with a higher GPA and a greater satisfaction with their major were more likely to enrol in master's programmes. In addition, having intrinsic motivations for choosing a major was a significant factor in pursuing a master's degree. However, participating in job preparation activities yielded different results. For example, a smaller number of graduates with internship experience or any other types of job search activities enrolled in master's programmes after graduation.

The discipline also influenced enrolment in master's programmes. More graduates in engineering and natural science enrolled in master's programmes, while graduates in social science and education were less likely to pursue a master's degree than those in the humanities. In addition, institutional characteristics had significant effects on pursuing a master's degree. Graduates from more prestigious universities enrolled more often in master's programmes than those from less prestigious universities. Graduates studying in larger cities were more likely to pursue a master's degree than students from other provinces. However, the institutional type was not significant.

Table 6 The effect of college GPA on enrolment in master's programmes

Master's programme	Number	Mean	SD	*T* test
Enrolment	1,558	83.813	7.668	− 10.390***
No enrolment	10,000	81.410	8.611	

Table 7 Results of the logistic regression

	Variables	Coef.	Std. err	Odds ratio
Individual characteristics	Gender (male)	0.382***	0.073	1.465
	Age	−0.070***	0.015	0.932
	Father having a bachelor's degree or above	0.323***	0.062	1.381
	Monthly family income (KRW4 million and over)	0.127*	0.061	1.136
	Student loan	0.002	0.009	1.002
Academic backgrounds	College GPA	0.044***	0.004	1.045
	Intrinsic motivations for major selection	0.423***	0.062	1.527
	Major satisfaction	0.131***	0.036	1.140
Job preparation	Internship experience	−0.245**	0.078	0.783
	Participation in job preparation activities	−0.068***	0.014	0.935
Disciplines	Social science	−0.929***	0.120	0.395
	Education	−0.625***	0.136	0.535
	Engineering	0.233*	0.097	1.262
	Natural science	0.670***	0.098	1.954
	Arts	−0.030	0.109	0.970
Institutional characteristics	Research university I	0.793***	0.086	2.211
	Research university II	0.428***	0.082	1.534
	Research-teaching university	0.190*	0.081	1.209
	Public university	−0.016	0.071	0.985
	Location (Seoul and Gyeonggi)	0.411***	0.064	1.509
Constant		−5.049***	0.553	
LR χ^2			846.35***	
Log likelihood			−3,901.930	
Pseudo R^2			0.0978	
N			10,906	

Discussion and conclusion

In this study, the factors influencing the pursuit of a master's degree among university graduates in Korea were empirically examined. The results show that gender, age and family socioeconomic status affected students' decisions to pursue a master's degree. In addition, academic backgrounds, such as discipline, satisfaction with undergraduate study and intrinsic motivations for the choice of major, had positive effects on enrolment in a master's degree. In contrast, active participation in the job search process during undergraduate study had negative effects on the decision. Finally, students from research universities in major cities were more likely to pursue a master's degree. These results have several implications for master's education in terms of motivations, expectations and demands of current students, not only in the Korean context but also in many other higher education systems.

First, according to the results of this study, university graduates are more influenced by academic backgrounds than job prospects when pursuing a master's degree in Korea. For example, students who chose their first major based on their academic interests and those who were more satisfied with their major were more likely to pursue a master's degree. In addition, more students were interested in pursuing their education based on their intrinsic motivations, such as increasing their disciplinary knowledge and improving their skills. They also had higher levels of academic achievement compared with their peers who had no interest in pursuing a master's degree. This finding is similar to the results of previous studies, suggesting that high academic achievement during undergraduate study or participation in research projects positively affects postgraduate enrolment decisions (Fox 1992; Heller 2001; Kniola et al. 2012; Millett 2003;

Zhang 2005). Most studies were done in USA context; however, the results were applicable to Korean context. For example, students who were satisfied with their undergraduate experience, such as experiencing good instruction practices and interactions with faculty members, were more likely to pursue a master's degree (Paulsen and Pascarella 2016).

These results may be related to the structure of master's programmes in Korea. Particularly in major research universities, these programmes tend to follow relatively traditional models of graduate education and focus on research-oriented programmes that are often integrated with PhD coursework. Students are eligible to take PhD courses and are evaluated based on the same criteria (except in professional graduate school programmes where they can start a master's programme). They also participate in the same research projects and events as PhD students. Some are often already considered 'pre-PhD' (Solem et al. 2013) and are expected to pursue an academic career, and this level of socialisation is expected when starting the degree programme. Thus, students are prepared to continue their studies rather than to pursue a stand-alone training programme to become practitioners. Lee and Brinton's (1996) study revealed similar results. Intrinsic factors such as study satisfaction and personal self-development are still more influential than extrinsic perspectives such as investment in future employability, income and prestige.

Investigating the pursuit of master's degrees in higher education systems that separate master's education from doctoral degree programmes is also worthwhile. In Korea, master's education has been mainly viewed as a stepping stone to the doctoral level for those seeking an academic career, until the government created different types of professional master's degrees. However, in some systems in Asia, such Hong Kong's, master's education has been divided into two categories: the research-oriented Master of Philosophy (MPhil) and others, including more professional types of self-financed degrees. These types of divisions influence prospect students' expectation and motivations.

Second, in terms of academic aspirations, students who have the clear goal during their undergraduate studies of finding a job are less likely to pursue a master's degree. Employment preparation is considered a different task for university graduates. For example, the results show that students who participated in job preparation activities such as internships were less likely to pursue a master's degree, which contrasts with Dinwoodie's (2001) findings that students chose to pursue a master's degree to improve their qualifications and attract future employers. Other studies have shown that students enrol in a master's degree when they cannot find a job, as it can prepare them for a better job. However, in the current study, these types of motivations were found to be weaker than other academic aspirations. The findings must be interpreted differently according to the higher education context. For example, it has been suggested that master's students in the US context are predominantly interested in careers outside academia, whereas faculty members and curricula tend to focus on preparing for research-oriented academic careers (Monk et al. 2012). Different expectations of degree programmes need to be specifically discussed by considering their unique environments.

Third, the decision to pursue a master's degree is related to institutional characteristics, and in this study, the students from research universities in major cities were most likely to pursue a master's degree. This result demonstrates the importance of the socialisation process in postgraduate education. As English and Umbach (2016) pointed out, the types of institutions in which students were enrolled during their first degree affected their access to a master's degree because they had different intellectual atmospheres and were exposed to advanced degrees and social networks.

Fourth, discipline is a significant factor involved in deciding to pursue a master's degree. Graduates from natural sciences, engineering and the humanities were more likely to pursue a

master's degree than graduates from science or education. This result can be interpreted differently, but most explanations are related to the labour market conditions for graduates in different fields. For example, Korean students in the arts, the humanities and natural sciences have more difficulty finding suitable jobs after graduation (Jung and Lee 2016) and often prefer to continue their studies instead of immediately entering the job market. In addition, in fields such as education and social science, students often return to pursue their education after working part-time for their professional development instead of starting immediately after graduation. From this perspective, it is interesting to find that engineering students were more likely to enrol in master's degrees than humanities graduates, as engineering graduates often face a more promising job market than graduates of other disciplines. However, this is related to the assumption that a master's degree would become more important for entry-level positions in science, technology, engineering and mathematics.

Finally, family backgrounds influenced the continuation of education both in terms of parents' economic status and educational level. This result is consistent with the results of previous studies proposing that students from first-generation, working-class and low-income families have limited access to advanced degrees (Paulsen and Pascarella 2016; Perna 2004). The results show that a family's SES strongly affects the pursuit of advanced degrees beyond the tertiary degree level across higher education systems. Given the growing number of students self-funding their master's degrees, it is important to consider how financial condition influences their decisions to continue their studies.

This study demonstrates that various factors affect students' decisions to pursue a master's degree in addition to their academic and employment aspirations. Although students often do not have a defined career plan at the beginning of their master's degree and can later change it as personal, family and social contexts change, it is still important to understand the main factors and motivations behind their decisions. Strategies should also be developed to manage the diversity of student backgrounds and training as they enter these programmes, including curriculum design and student guidance. The research findings can provide implications for redesigning programmes that better meet the expectations of current master's degree students by considering the diversity of their academic, cultural and professional backgrounds.

Despite its significant findings, this study has limitations. First, the study did not consider different types of master's degrees. For example, some are professionally oriented, and students have a clear goal when they enrol in these programmes, such as gaining a specific qualification or certificate. The study did not take into account the differences between full- and part-time study modes. Many part-time students already have jobs, and thus, the master's degree mainly serves to improve their current job status. These different types of degrees and study modes should be considered separately in future research. In addition, longitudinal analyses of graduates' completion of their master's degrees and its effects on their aspirations for academic career or job performance should be conducted. Finally, the quality of their learning experience during the master's degree should be explored by taking an in-depth qualitative approach.

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