

Do External Activities Matter? Research Expectations and Social Service Contributions in Taiwan Academia

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ABSTRACT

Higher education institutions provide professional and cross-disciplinary contributions to solving real-world problems and improving institutional governance (Figueiró et al., 2022). This study adopts the Expectancy-Value Theory (EVT) to investigate the differences in and relationships among academics' research expectations, external activities, and social contributions in Taiwanese HEIs. It examines individuals' expectancy beliefs and the value they attach to their current activities or achievements on future tasks. The present study adopted *The Academic Profession in a Knowledge-Based Society* as a research instrument. Data were collected from Taiwanese HEIs in 2019, and 1,524 Taiwanese academics were enrolled. After questionnaires with incomplete data were excluded, 1,206 valid surveys were obtained, yielding an effective rate of 79.13%. The research provides three crucial findings: first, the research variables vary significantly across individual factors; second, academics' external activities mediate the relationship between individual research expectations and social contributions; and third, external activities significantly moderate the relationship between academics' research expectations and social contributions. The findings contribute to extant research on EVT by demonstrating the complex relationships between various dimensions of academic work environments. Furthermore, they provide a reference for enhancing institutional governance in HEIs.

Keywords: APIKS, Expectancy-Value Theory, External Activities, Research Expectations, Social Service Contributions

Introduction

Higher education institutions (HEIs) are places of social learning where individuals with distinct interests, expectations, values, goals, and constructions of reality congregate and create an environment for meaningful learning (Heffernan et al., 2018). HEIs and the academic profession have the potential to offer novel solutions to address worsening problems related to sustainability (Mok, 2015). The goal of HEIs - the pursuit of research and transmission of knowledge—is generalized and substantiated by each member of academia, and increasingly specialized methods are employed by HEIs to adapt to a diverse and evolving environment (Kwiek, 2017; Rawn & Fox, 2018).

Understanding the various aspects of the academic profession, including teaching, research, campus operation, outreach activities, and social contributions, is vital for ensuring effective institutional governance. Globally, higher education systems have undergone unprecedented transformations. The academic profession has changed regarding institutional governance and management models, teaching load, research intensity, participation in external activities, administrative service performance, and social contribution (Carvalho, 2017; Mudrak et al., 2018). Although HEIs worldwide have common origins and are primarily modern institutions focused on teaching, research, and public service, they exhibit different academic professional development patterns (Altbach, 2007).

In 2018, *university social responsibility* was promoted in Taiwan, enabling HEIs to become active contributors to social sustainability (Ministry of Education, 2018). This *university social responsibility* project guides HEIs in adopting a social-centered approach and addressing social requirements through five strategies: (a) promoting the integration of research expectations and external activities - HEIs link the outcomes of research by facilitating partnerships between public agencies and private businesses and promoting external activity cooperation, which accelerates the close relationships between HEIs research expectations with participation of external activities; (b) enhancing connections between external activities and social service contribution - encouraging academics to contribute to social service through the development of external activities on their localities; (c) strengthening connections between HEI research expectations and social service contribution - emphasizing the social value of collaboration between academia and industry which can upgrade the value of social service and enhance the research expectations of companies; (d) connecting the relationships among research expectations, external activities, and social service contribution - invigorating research networks for social sustainability by encouraging academics to engage in external activities for social service contribution; and (e) collaborating with other institutions abroad to expand research horizons - HEIs increase social engagement with international institutions and enhance global research cooperation and expectations. Moreover, this collaboration enables the promotion of high co-ownership of research expectations, the establishment of multiple participation in external activity models, and the promotion of social service contributions (Ministry of Science and Technology, 2014). In conclusion, this national project enhances the relevance of research expectations, academics' participation in external activities, and social service contributions to academia-industry collaborations (Ching, 2021; Wu, 2013).

Eccles et al. (1983) developed the Expectancy–Value Theory (EVT) of achievement motivation, which provides a framework for understanding how individuals' self-expectations affect their value of task activity participation and social service achievements. According to past studies, numerous

psychologists have posited that individuals' expectations and task values are essential in understanding their motivation for participating in various activities and social service contributions based on EVT theory (Demb & Wade, 2012; Song, 2018; Vargiu, 2014). Demb and Wade (2012) asserted that academic participation in external outreach activities is required to promote their research expectations and contributions to society. Song (2018) stated that HEIs' higher research expectations for academics increase their efforts to obtain research projects and the time spent on external activities. Vargiu (2014) contended that higher individual academic research expectations might promote academics' contributions to social service through either socially oriented or commercially oriented external activities. The above studies show that academics' participation in external activities may affect individual or institutional research expectations and social service contributions. To further examine the EVT theory, the main goal of this study is to explore the relationships among academics' research expectations, external activities, and social service contributions in Taiwan HEIs.

Literature review

Diversity in Higher Education on Academic Profession

A study on critical trends in higher education research identified "diversity" as one of the most persistent topics over five decades (Brennan et al., 2008). "Diversification" refers to a desirable or inadvertent trend that emerged in response to the "explosion" of systematic knowledge and the goals of institutional governance. Policies related to higher education may induce moderate or significant growth in diversity (Teichler, 2010). Geschwind and Broström (2015) asserted that research-oriented professors receive more funds from external sources, conduct more interdisciplinary research, and make more academic contributions to industry-academia collaboration than teaching-oriented professors. Zacher et al. (2011) contended that relative to senior academics, junior academics may spend more time on research, teaching, and service in pursuit of promotions. Studies have revealed that female professors are more devoted to social contributions than their male counterparts (Hicks, 2015; Settles et al., 2022). However, other studies have revealed that male academics generally hold important positions in HEIs, leading to more opportunities for their participation in external activities, such as public lectures and speeches, executive roles, contract-tailored programs and courses, and external boards and committees (e.g., expert councils, boards of directors, and boards of trustees) (Fisher & Kinsey, 2014; O'Connor & Irvine, 2020). Another study argued that private HEIs feature more industry-academia collaborations and commercially oriented research expectations for academics for providing external resources relative to public HEIs (Khalid et al., 2012).

To conclude, the above findings indicate the diversity of the academic profession in HEIs. To understand the diversity of Taiwanese academics in HEIs, the study compares personal and institutional norms with various background factors (e.g., academic rank, academic field, institution type, academic preference, gender, and age). By comparing differences in academics' research expectations, external activities, and social contributions attributed to certain individual factors, this study further examined the diversity of academic professions in Taiwanese HEIs.

Expectancy-Value Theory (EVT) in Academic Profession

Over the past century, numerous psychologists have posited that individuals' expectations and task values are critical in understanding their motivation for performing various activities (Higgins, 2007; Meyer, 2016; Rokeach, 1973). Meyer (2016) highlighted that individuals with high self-expectations have higher task values and participation in social activities. Both expectations and task values are stable factors that influence various beliefs, attitudes, norms, intentions, and behaviors of individuals and institutions within society (Higgins, 2007; Rokeach, 1973). Eccles and colleagues (1983) developed the EVT of achievement motivation, which provides a framework for understanding how individuals' self-perceptions, others' perceptions, and aspects of their learning environment affect their task choices, aspirations, and achievement.

The EVT defines expectations for success as individuals' beliefs about how well they will complete future tasks. Furthermore, task value comprises three components in the EVT: intrinsic value, attainment value, and utility value (Eccles, 2007; Eccles et al., 1983; Wigfield et al., 2016). Intrinsic value represents the extent to which an individual enjoys completing a task or the consequences of completing a task. Attainment value denotes the extent to which an individual views a task as personally meaningful or important. Utility value refers to the extent to which an individual believes a task will help achieve current or future goals.

Several studies have applied the EVT theory to investigate individuals' self-expectancy and work value (Bong et al., 2014; Dorenkamp & Ruhle, 2019; Wigfield et al., 2015). Bong et al. (2014) reported that individuals' research expectations of success can significantly improve their work motivations and external activity participation. Wigfield et al. (2015) found that individuals with a high passion for external activities may be more active in social service contributions. Dorenkamp and Ruhle (2019) further pointed out that individuals' high research expectations of success play a crucial role in adopting social-oriented contributions that may be significantly moderated and mediated by their work value of external activities.

The EVT theory is a framework for exploring the relationships between individuals' research expectations, work-related motivational beliefs, and social contribution behavior. Thus, the present study extends relevant studies by adopting the EVT theory to explore the relationships among Taiwanese academics' research expectations, external activities, and social service contributions in HEIs.

Current Study

This study examined diversity in the academic profession in terms of how academics in Taiwanese HEIs perceive their workplaces and how these perceptions affect their achievement performance. We explored these effects using the EVT framework, a well-established model of organizational behavior (Eccles et al., 1983), to analyze the relationships among academics' research expectations, external activities, and social contributions. It provides insights that enrich the extant literature focusing on Taiwanese HEIs. First, previous studies indicated the diversity of the academic profession in HEIs (Geschwind & Broström, 2015; O'Connor & Irvine, 2020; Settles et al., 2022; Zacher et al., 2011). Thus, the study would further explore the diversity within the academics in Taiwan by analyzing the differences in their research expectations, external activities, and social service contributions

attributed to certain individual factors. Second, Demb and Wade (2012) pointed out that academics' external activity participation can help them promote their research expectations and have more opportunities for social service contributions. Thus, this study would implement path analysis based on the EVT theory to examine the mediating role of external activities in the relationship between academics' research expectations and social service contributions. Third, Dorenkamp and Ruhle (2019) pointed out that individuals' research expectations play an important role in adopting social-oriented contributions that their work value of external activities may significantly moderate. Thus, the study would extend the previous studies to investigate the moderating effects of external activities on different dimensions of academics' research expectations and social service contributions by employing multiple hierarchical regression. Based on the EVT and the literature review, we empirically evaluated the following hypotheses in a large sample of Taiwanese academics in HEIs.

H1: Academics differ significantly in terms of their research expectations, institutional research expectations, external activities, and social contributions, and these differences are contingent on various individual factors (i.e., academic rank, academic field, institution type, academic preference, gender, and age).

H2: Academics' external activities mediate the relationships among individual research expectations, institutional research expectations, and social contributions.

H3: Academics' external activities moderate the relationships among individual research expectations, institutional research expectations, and social contributions.

Methodology

Data Collection

The current study's participants were full-time academics employed at Taiwanese HEIs. Potential participants were contacted by email and provided relevant information about the research. The purpose of the survey was explained in the opening remarks, and the confidentiality of respondents was guaranteed.

This study used data from *The Academic Profession in Knowledge-Based Society* (APIKS), an international comparative survey conducted in more than 30 countries. The survey covers six themes related to the academic profession: career and professional situations, general situations and activities, teaching, research, external activities, and governance and management. In addition, it includes the experiences of academics in formative career stages (APIKS-IDB, 2021). The analytical variables used in this study were extracted from APIKS, namely, six questions on the respondents' background (i.e., academic rank, academic field, institution type, academic preference, gender, and age), four items on individual research expectations, three items on institutional research expectations, eighteen items on participation in external activities, and four items on social contributions.

Data were collected through a paper survey that was distributed in 2019. Samples with missing values were excluded from the analysis, resulting in 1,206 cases used for analysis. As presented in Table 1, more than 75% of the respondents were associate professors (35.8%) or assistant professors (39.6%); 48.4% were social science academics, and 51.6% were natural science academics. Most of the

respondents were from public HEIs (62.1%), and the sample included more teaching-oriented academics (61.4%) than research-oriented academics (38.6%). Male respondents (64.8%) outnumbered female respondents (35.2%). In addition, to analyze the differences in academic performance by age, this study divided the survey respondents into three categories: middle-aged (<50 years; 35.1%), senior (50–60 years; 46.9%), and golden-aged (>60 years; 18.0%). We compared the demographic distribution of the survey sample with that of the general population to verify its representativeness. The results indicated that the survey respondents were relatively representative of the general population regarding their factors.

Table 1: Demographic characteristics of participants (N = 1,206)

Individual Factors	Demographics	Frequency	Percentage (%)
Academic rank	Professor	259	21.5
	Associate Professor	432	35.8
	Assistant Professor	478	39.6
	Others	37	3.1
Academic field	Social science	584	48.4
	Natural science	622	51.6
Institutional type	Private HEIs	456	37.9
	Public HEIs	750	62.1
Academic preference	Teaching-oriented	741	61.4
	Research-oriented	465	38.6
Gender	Male	781	64.8
	Female	425	35.2
Age	Middle (under 50 years old)	422	35.1
	Senior (50-60 years old)	567	46.9
	Golden (above 60 years old)	217	18.0
Total		1,206	100

Variables and Measures

This study examined the four critical variables of academics' research expectations, institutional research expectations, external activities, and social contributions. To examine the content validity of the constructs, this study recruited a total of 12 experts to determine whether each item was "essential," "useful but not necessary," or "not necessary" for accurately measuring the constructs (Cohen & Swerdlik, 2010). The experts were six field experts specializing in higher education and six professional experts highly proficient in psychology and educational variable measurement. The content validity ratios (CVRs) of each item were determined. Each CVR is expressed as the ratio of experts stating that an item is required to the total number of experts consulted (Lawshe, 1975). Moreover, the CVR can determine which items to retain and which to remove, thereby improving the scale's validity (Gilbert & Prion, 2016).

As presented in Table 2, academics' research expectations were measured using the question, "How would you characterize the emphasis of your primary research in the past two academic years?". The items were scored on a Likert scale ranging from 1 to 5, and each item separately assessed academics' basic, applied, commercially oriented, and socially oriented individual research expectations. The CVR values of four individual research expectation items met the minimum standard CVR value of 0.56. Next, institutional research expectations were measured using the question, "To what extent do you consider yourself to be exposed to the following expectation by your institution?". The items

were scored on a Likert scale ranging from 1 to 5, and each item separately assessed the effects of institutional research expectations on academics' external funds, applied research, and industry-academia collaboration. The CVR values of all three items met the minimum standard CVR value of 0.56. Academics' external activities were measured using the question "In the past three years, have you been involved in any of the following activities with external partners (e.g., industry, government, museum, or school)?" The survey included 18 optional items, and the scores were calculated by summing the number of items the respondents selected. The CVR values of the items were at least 0.67, meeting the content validity criteria. Finally, academics' social contributions were measured using the question, "To what extent do your external activities contribute to the following items?". The items were scored on a Likert scale ranging from 1 to 5, and each item separately assessed academics' contributions to the local community, industry, society at the national level, and society at the international level. The CVR values of all four items met the criteria for good content validity. In conclusion, the CVR values of all items met the minimum standard CVR value, indicating good content validity, and these items were retained in the final survey.

Analytical Model and Data Analysis

We employed three research frameworks to examine our hypotheses. First, descriptive statistics were used to analyze the data and develop the research model. The background factors were compared (Figure 1). Independent *t*-tests and analysis of variance (ANOVA) were implemented to compare the differences in academics' research expectations, external activities, and social contributions stratified by certain individual factors.

Second, structural equation modeling (SEM) was implemented to test the EVT framework, examine the research variables' relationships, and investigate the mediating effect of external activities on the relationship between academics' research expectations and social contributions (Figure 2). In the SEM model, no missing values or outliers were detected, and all reported coefficients from our analyses were standardized.

Moreover, multiple hierarchical regression was implemented to test the EVT framework and to verify the relationships among each item for the four variables (Figure 3). This analysis also examined the potential moderating effect of external activities on the relationship between research expectations and social contributions. Before the regression analysis was implemented, this study cross-checked the multicollinearity among the independent variables, and the variance inflation factor of the independent variables was less than 10.

Table 2: Variables, items, measurement, and CVR value of the survey

Variables	Items	Measurement	n_e	N	CVR
Individual Research Expectation	How would you characterize the emphasis of your primary research in the past two academic years?	5 Point Likert scale (1= strongly disagree to 5= strongly agree)	10	12	0.67
	1. Basic/theoretical		10	12	0.67
	2. Applied/practically-oriented		11	12	0.83
	3. Commercially oriented/intended for technology transfer		11	12	0.83
	4. Socially oriented/intended for the betterment of society				
Institutional Research Expectation	To what extent do you consider yourself to be exposed to the following expectations by your institution?	5 Point Likert scale	10	12	0.67
	1. Raising substantial amounts of external funds		11	12	0.83
	2. Conducting applied (and possibly commercially oriented) research		11	12	0.83
	3. Being active in carrying the research results beyond typical publications (technology transfer, dissemination in various media, etc.)				
External Activities	In the past three years, have you been involved in the following activities with external partners (e.g., industry, government, museums, and schools)?	Sum of the chosen items (18 items in total)	10	12	0.67
Social Service Contribution	To what extent do your external activities contribute to the following items	5 Point Likert scale	11	12	0.83
	1. The local/regional community		11	12	0.83
	2. Industry		10	12	0.67
	3. Society at the national level		10	12	0.67
	4. Society at the international level				

Note: n_e : number of experts who indicated 'essential'; N : number of experts; content validity ratio (CVR) = $(n_e - N/2) / (N/2)$; for 12 experts, the estimated CVR value of each accepted item must exceed 0.56 (Lawshe, 1975)

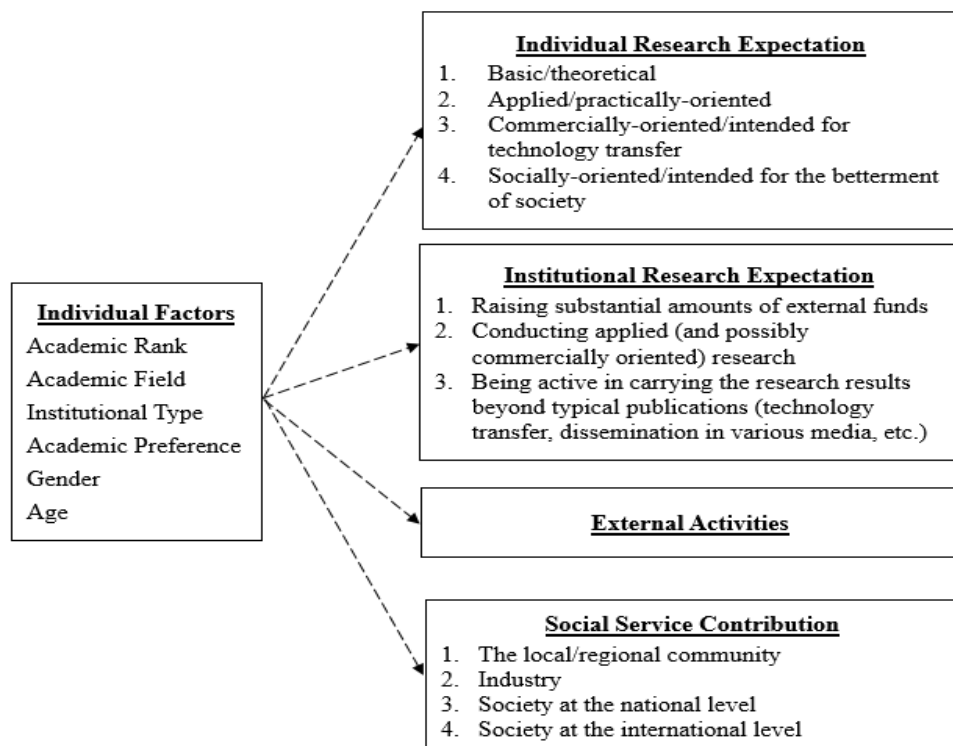


Figure 1: Research framework for research hypothesis 1

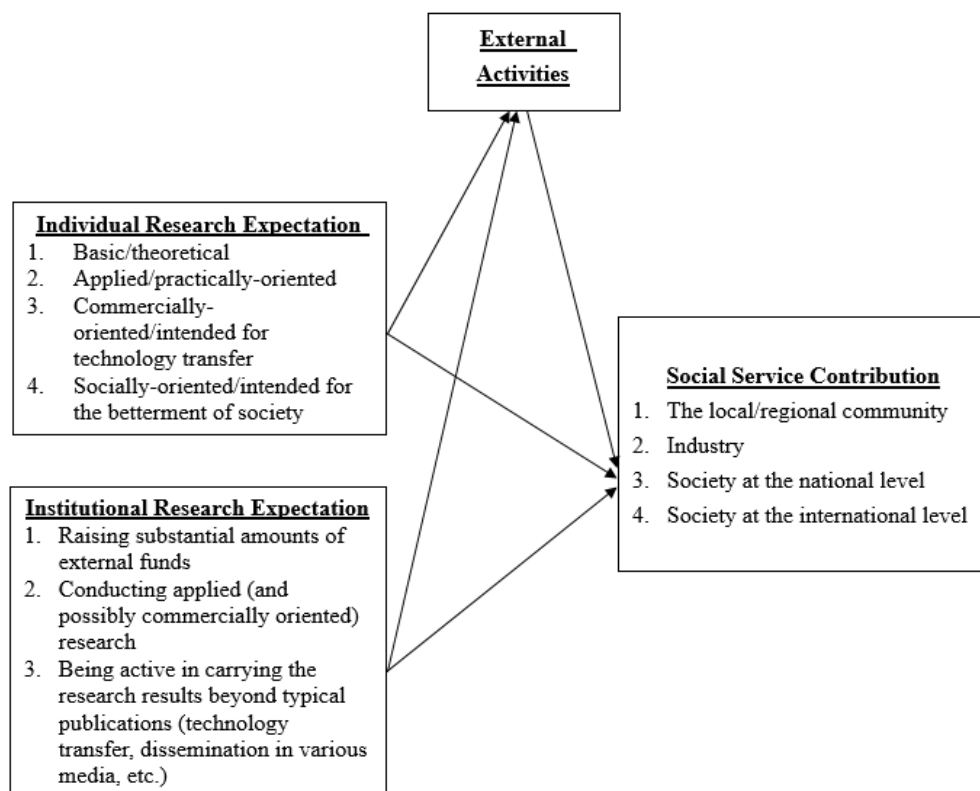


Figure 2: Research framework for research hypothesis 2

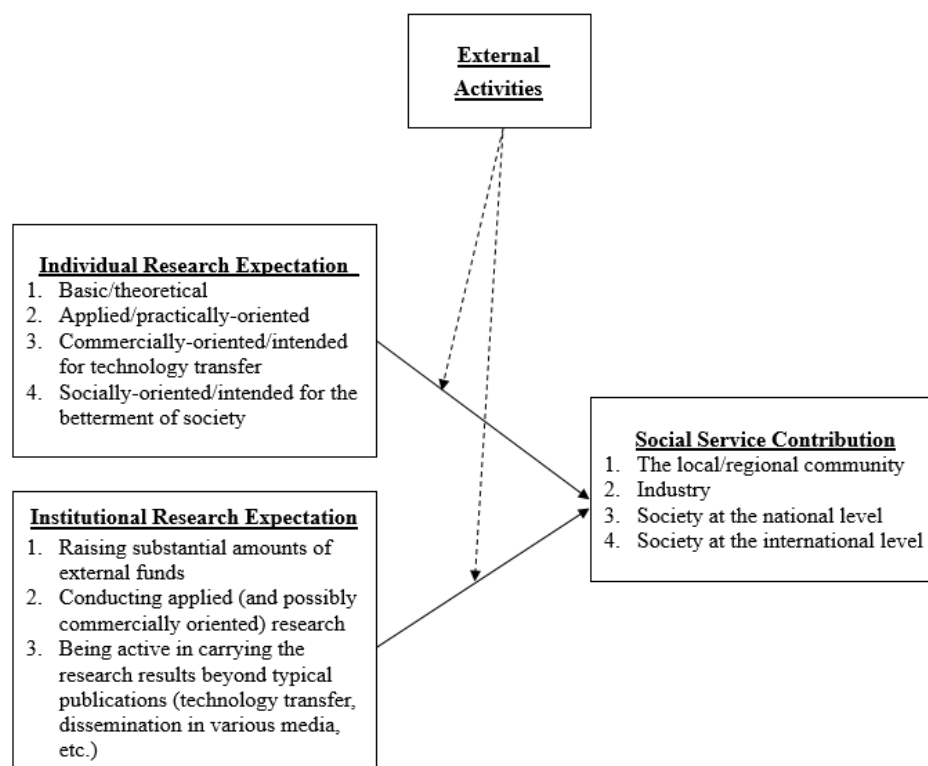


Figure 3: Research framework for research hypothesis 3

Results

Difference Analysis of Individual Factors

This study implemented independent *t*-tests and ANOVA to analyze the differences in six individual factors concerning academics' research expectations, institutional research expectations, external activities, and social contributions (Appendix 1). First, the results for academic rank indicated that professors have higher scores for external activities than assistant professors and other academics ($F = 9.884, p < .001$). Second, the results for the academic field indicated that Taiwanese social science academics generally have higher socially oriented individual research expectations ($t = 6.216, p < .001$) and that they are more motivated than natural science academics to provide local or regional social contributions ($t = 2.374, p = .018$). However, Taiwanese natural science academics may be more active in disseminating research results beyond typical publications, such as for technology transfer, than social science academics ($t = -3.463, p = .001$). Third, the results for institution type indicated that Taiwanese academics in private HEIs are more active in technology transfer ($t = 2.918, p = .004$) and participation in industry-oriented social contributions ($t = -2.032, p = .042$) than Taiwanese academics in public HEIs. Fourth, the results for academic preference revealed that research-oriented academics have higher applied individual research expectations ($t = -3.037, p = .002$) and greater willingness to engage in international social contributions ($t = -5.517, p < .001$) than teaching-oriented academics. Fifth, the results for gender revealed that male academics are more motivated to engage in technology transfer related to individual research expectations ($t = 2.371, p = .018$) and industry-oriented social contributions ($t = 2.141, p = .032$).

than female academics. The results for age revealed that middle-aged academics have higher expectations for engaging in applied research, such as technology transfer ($F = 3.077, p = .047$), and for participating in international social contributions ($F = 5.180, p = .006$). Furthermore, golden-aged academics may possess more substantial social influence, more academic experience, and greater socially oriented individual research expectations ($F = 4.211, p = .015$) than middle-aged academics.

SEM Analysis

This study first examined the variables' reliability and validity to ensure the models' interpretability. The reliability of all variables was greater than 0.7, indicating good internal consistency (Table 3). Two validity indicators (i.e., convergent validity and discriminant validity) were examined to verify the validity of the models (Hair et al., 2010). First, in this study, confirmatory factor analysis was implemented to evaluate convergence validity: (a) the values of the average variance extracted (AVE) ranged from 0.53 to 0.66, exceeding the minimum threshold of 0.5 (Fornell & Larcker, 1981), and (b) the values of composite reliability (CR) ranged from 0.71 to 0.80, exceeding the threshold of 0.6 (Bogozzi & Yi, 1988). Therefore, the variables in the model had good convergent validity. Next, discriminant validity was evaluated based on the square root of the AVE. As presented in Table 3, the values of the square root of the AVE were 0.77, 0.73, 0.81, and 0.77, and all values were larger than the absolute value of the correlation coefficient between that variable and other variables, meeting the discriminant validity criterion (Fornell & Larcker, 1981).

To assess the fit of the structural model, this study employed several model fit criteria: a root mean square error of approximation (RMSEA) less than 0.08, a standardized root mean square residual (SRMR) less than 0.06, and goodness-of-fit index (GFI) and comparative fit index (CFI) values greater than 0.90 (Hu & Bentler, 1999). All the model fit criteria were satisfied (GFI = 0.99, CFI = 0.92, RMSEA = 0.08, SRMR = 0.04); therefore, the theoretical model could be employed to examine the relationships among academics' research expectations, institutional research expectations, external activities, and social contributions.

The results of SEM analysis (Figure 4) revealed that academics' research expectations positively and significantly influence their external activities ($\beta = .21^{***}$); academics' external activities positively and significantly influence their social contributions ($\beta = .22^{***}$); and academics' research expectations positively and significantly influence their social contributions (direct effect: $\beta = .22^{***}$; indirect effect: $\beta = .10^{**}$). However, the results indicate that institutional research expectations do not significantly influence external activities ($\beta = .05$) or social contributions ($\beta = .06$). In conclusion, this study demonstrated that academics' participation in external activities mediates the relationship between individual research expectations and social contributions but does not mediate the relationship between institutional research expectations and social contributions.

Table 3: Descriptive statistics and Pearson's correlation matrix of the variables

	1	2	3	4
Individual research expectation	0.77			
Institutional research expectation	0.13**	0.73		
External activities	0.21**	0.08**	0.81	
Social Service Contribution	0.28**	0.15**	0.28**	0.77
Mean	3.14	2.96	4.94	3.26
SD	2.71	2.27	2.26	2.82
AVE	0.60	0.53	0.66	0.59
CR	0.76	0.71	0.80	0.78

Note: ** $p < .01$; coefficients on diagonal lines indicate the root of AVE of each variable

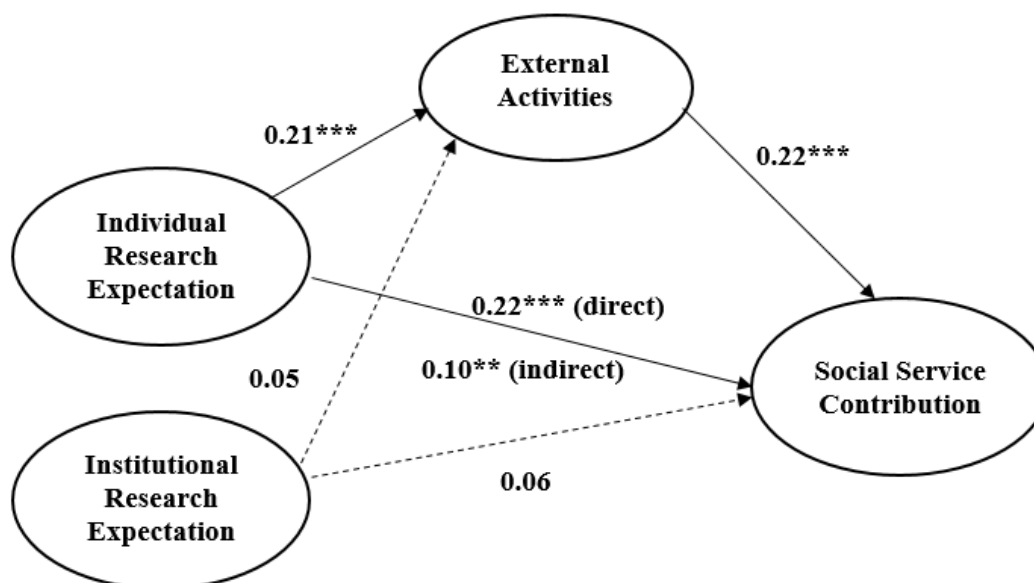


Figure 4: Structural equation modeling with standardized coefficients of the structural model

Multiple Hierarchical Regression Analysis

This study implemented multiple hierarchical regression models to examine the moderating effects of external activities on the relationships between (each item of) individual research expectations or (each item of) institutional research expectations and (each item of) social contributions. As presented in Table 4, the complete set of predictors (i.e., main effects of control variables and independent variables as well as interaction effects) explained 12.2% of the variability in *local or regional social contributions*, 35.9% of the variability in *industry-level social contributions*, 25.6% of the variability in *national social contributions*, and 24.5% of the variability in *international social contributions*. These regressions revealed that external activities significantly moderate the relationship between academics' socially oriented individual research expectations and local or regional social contributions ($\beta = .289$, $p < .05$) and the relationship between academics' commercially oriented individual research expectations and industry-level social contributions ($\beta = .232$, $p < .05$).

As provided in Table 5, the complete set of predictors (i.e., main effects of control variables and independent variables as well as interaction effects) explained 30.0% of the variability in *local or*

regional social contributions, 27.7% of the variability in *industry-level social contributions*, 22.7% of the variability in *national social contributions*, and 23.6% of the variability in *international social contributions*. The results revealed that external activities significantly moderate the relationship between institutional research expectations related to disseminating research results beyond typical publications and industry-level social contributions ($\beta = .287, p < .05$).

Table 4: Multiple hierarchical regression analysis for the moderating effect of external activities on the relationships between individual research expectation and social service contribution

	local/regional community	industry	society at the national level	society at the international level
Control variables				
academic rank	.020	-.024	.021	-.009
academic field	-.008	.067*	.002	-.010
institutional type	-.037	-.066*	.045	.017
academic preference	-.032	-.037	.052	.167***
gender	.083**	-.013	.033	.035
age	-.033	.010	-.005	-.055
Independent variables				
basic/theoretical	.081	.104	.102	.021
applied/practically-oriented	-.009	.076	.141	.049
commercially oriented/intended for technology transfer	-.059	-.011	-.103	.135
socially-oriented/intended for the betterment of society	.005	.104	.012	.080
external activities	-.105	-.124	.248	.206
Interaction variables				
basic/theoretical*external activities	-.009	.004	-.100	-.014
applied/practically-oriented* external activities	.101	.158	-.238	-.095
commercially- oriented/intended for technology transfer*external activities	.088	.232*	.122	-.045
socially-oriented/intended for the betterment of society*external activities	.289*	.001	.174	-.058
<i>F</i> value	8.410***	8.972***	4.271***	3.895***
<i>R</i> ²	.122	.359	.256	.245

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Table 5: Multiple hierarchical regression analysis for the moderating effect of external activities on the relationships between institutional research expectation and social service contribution

	local/regional community	industry	society at the national level	society at the international level
Control variables				
academic rank	.026	-.020	.028	.003
academic field	-.074*	.023	-.034	-.027
institutional type	-.029	-.066*	.049	.016
academic preference	-.024	-.018	.053	.171***
gender	.053	-.050	.017	.029
age	-.021	.011	.005	-.042
Independent variables				
raising substantial amounts of external funds	-.005	.003	-.021	.116
conducting applied research	-.036	.004	.100	.093
being active in carrying the research results beyond typical publications	.052	-.045	.043	.135
external activities	.047	-.060	.185	.289*
Interaction variables				
raising substantial amounts of external funds*external activities	.062	.026	.064	-.107
conducting applied research* external activities	.075	.045	-.069	-.058
being active in carrying the research results beyond typical publications* external activities	.132	.287*	.009	-.144
<i>F</i> value	6.967***	5.824***	3.835***	4.134***
<i>R</i> ²	.300	.277	.227	.236

Note: * $p < .05$, *** $p < .001$

Discussion

Understanding Academic Profession Diversity in Taiwan HEIs

This study first compared the differences in academics' research expectations, external activities, and social contributions attributed to certain individual factors for analyzing the diversity within the academic profession in Taiwanese HEIs. These findings provide insights into the differences in Taiwanese academic professional development patterns attributed to individual factors. Six findings from this investigation are noteworthy and contribute to the extant higher education literature. First, regarding academic rank, studies have asserted that junior academics such as assistant professors generally dedicate more effort to teaching, research, and service than senior academics for several reasons: (a) to acquire more work and social experiences; (b) to enhance the visibility and reputation

of their university; (c) to express their high job enthusiasm and self-expectations; (d) to obtain more resources and funding for research; (e) to establish connections and interpersonal interactions; and (f) to attain academic promotions (Bentley & Kyvik, 2013; Esdar et al., 2016; Mishra & Smyth, 2013). The Taiwanese government is actively promoting university social responsibility, and our findings indicate that Taiwanese professors who may possess more educational resources and experience in academic endeavors participate in more external activities than assistant professors and other academics.

Second, our results comparing academic fields align with those of Datu et al. (2017), revealing that social science academics are generally more motivated to participate in socially oriented activities. Moreover, Taiwanese social science academics may be more willing to contribute to local or regional society than natural science academics. By contrast, Taiwanese natural science academics are more active in leveraging their research results beyond typical publications, for example, for technology transfer and dissemination through various media channels, than social science academics.

Third, our results for institution type are consistent with those of Khalid et al. (2012), revealing that private HEIs in Taiwan are more active in technology transfer and industry-academia collaboration to obtain more research funds and external resources than public HEIs. Studies have described that an increasing number of private HEIs in Taiwan have established policies that encourage academics to apply for more industry-academia collaboration projects, and private HEIs even use these projects as evaluation indicators for promotion.

Fourth, concerning academic preference, most HEIs in Taiwan value academics' research performance and have higher research expectations for these academics. These HEIs actively form international research collaborations to enhance their global reputation and ranking. Thus, research-oriented academics generally have higher applied individual research expectations and higher willingness to engage in international-level social contributions than teaching-oriented academics. This finding aligns with those of Geschwind and Broström (2015) and provides further insights into academic preferences in professional development in Taiwan.

Fifth, in contrast to the results of a relevant study (Hicks, 2015), which contended that female professors are often more devoted to social contributions than male professors, our results indicated that male academics have higher commercially oriented individual research expectations and industry-level contributions than female academics, which cultural differences may influence. First, because of traditional Chinese social expectations, male students tend to major in science, technology, engineering, and mathematics (STEM). In contrast, female students tend to major in social sciences, humanities, and the arts. Although the gender gap in STEM is shrinking in Taiwan, previous results indicate that most men still choose STEM, whereas women tend to choose fields such as education, social services, language, and the arts (Chang & Chang Tzeng, 2020; Hsieh, 2019). Second, male academics generally hold essential positions in HEIs and have more opportunities to participate in external activities that strengthen their research expectations and enhance their motivation to engage in social contributions (O'Connor & Irvine, 2020). Therefore, our findings revealed that male academics are more motivated to participate in industry-academia collaboration, technology transfer research, and industry-level service contributions than female academics.

Lastly, this study examined the differences in academic performance by age. The results revealed that age was not a significant factor. In recent years, an increasing proportion of the working population has delayed retirement because of Taiwanese pension reform and the increased retirement age. To analyze the differences between academic age groups, this study categorized the participants into middle-aged (<50 years), senior-aged (50–60 years), and golden-aged (>60 years) groups. Consistent with the findings of Zacher et al. (2011), our findings indicated that middle-aged academics generally have higher engagement in applied research and higher participation in international-level social contributions. The findings revealed that golden-aged academics may possess more social influence and academic experience and have higher socially oriented individual research expectations than middle-aged academics.

The effect of external activities on the relationship between research expectations and social service contributions

This study examined the relationship among the research variables by the EVT. It analyzed the mediating and moderating effects of external activities on the relationship between Taiwanese academics' research expectations and social contributions. Our results prove EVT dynamics among Taiwanese academics' research expectations, external activities, and social contributions. First, the results revealed that academics' research expectations significantly influence their external activities. Therefore, like the findings of Meyer (2016), our findings imply that academics with higher self-expectations for their research performance may participate more in external activities. That study asserted that individuals with higher self-expectations possess higher task values and participate more in social activities. Second, similar to the results of Demb and Wade (2012), our results indicate that academics' external activities can significantly predict their social contributions. The Taiwanese government's promotion of university social responsibility provides academics more opportunities to engage in various external activities. These activities enable them to explore new avenues, establish meaningful connections with the community, and contribute their expertise and knowledge to local networks and regional development. Third, the findings of this study align with those of Wigfield et al. (2015). That study contended that individuals' high expectations of success play a crucial role in the adoption of approach-oriented mastery goals and performance goals. In addition, these findings indicate the mediating effect of academics' participation in external activities, which influences their research expectations and social contributions. Our study revealed that Taiwanese academics with higher research self-expectations seek more opportunities to engage in diverse external activities to implement research projects, effectively contribute to society, and enhance industry-academia collaboration and sustainable academic research development. Lastly, this study revealed that academics' participation in external activities plays a crucial mediating role, especially in the relationship between individual research expectations and social contributions, but not in the relationship between institutional research expectations and social contributions. The results indicate that Taiwan's teaching and research policies encourage academics to use individual competition-based funding to enhance their teaching practice research and fulfill their social responsibilities. Academics with higher individual research expectations may be more willing to participate in external activities, influencing their intention to contribute to society.

Furthermore, the present study found that external activities can moderate the relationship between academics' research expectations and social contributions. According to the EVT, individuals' beliefs about how well they perform tasks substantially affect their future achievement performance

through the level of involvement in external activities (Dorenkamp & Ruhle, 2019; Higgins, 2007). The current study provides insights into the moderating effects of participation in external activities on the relationships between the following: (a) socially oriented individual research expectations and local or regional social contributions - when academics have higher socially oriented individual research expectations, they may have a higher willingness to contribute to the local or regional community through socially oriented external activities; (b) commercially oriented individual research expectations and industry-level social contributions - when academics have higher commercially oriented individual research expectations, they may be more motivated to participate in industry-level social contributions through their engagement in industry-oriented external activities; and (c) institutional research expectations for the dissemination of research results beyond typical publications and industry-level social contributions - when HEIs have higher research expectations that academics leverage their research results beyond typical publications (e.g., technology transfer), academics provide industry-level social contributions through their participation in industry-oriented external activities. Therefore, we recommend that HEIs assist academics in identifying their suitable research domains and determining whether they are socially or commercially oriented. Besides, HEIs should help academics obtain external educational resources and research project grants, enabling them to engage in socially oriented services and industry-academia collaboration. Such measures can promote more complete and diversified institutional governance and the development of high-quality higher education.

When a country provides research support, the societal demand for new knowledge and technology grows exponentially. Research-focused HEIs, which emerged in the mid-1990s and have gained prominence since the introduction of global education rankings in the 2000s, are at the core of research systems and have reshaped the landscape of national higher education systems (Altbach, 2009). These initiatives were initially implemented primarily in East Asia, including Taiwan, and were driven by their rapidly developing national economies and accompanying demands for new knowledge and technology. Therefore, this study recommends that each HEI identify its function and position to establish sustainable development strategies. HEIs should emphasize research publications, socially oriented activities, and industry-academia collaboration to encourage engagement in local, regional, and industry-level social contributions. These measures can promote the development of sustainable institutional governance and high-quality higher education.

Importance of Findings and Implications

The EVT successfully explains the relationships among academics' research expectations, external activities, and social contributions in Taiwanese HEIs. First, the findings indicate that academics' research expectations and external activities significantly foster their social contributions, accounting for 27% of the variance in the mediation results. Participation in external activities substantially affects academics' research expectations and social contributions. Thus, HEIs should provide increased support and encouragement to academics in pursuing research projects and funding, fostering stronger connections with local communities and industries. When academics engage in more external activities, they can broaden their perspectives and raise their research expectations, which enhances their motivation to contribute to social communities.

Second, analyzing the moderation effects of external activities also provides valuable insights into predicting the effects of academics' individual and institutional research expectations on social

contributions. Greater participation in external activities strengthens the positive relationship between socially oriented individual research expectations and local or regional social contributions. In addition, greater participation in external activities strengthens the positive relationship between commercially oriented individual research expectations, institutional research expectations related to disseminating research results beyond typical publications, and industry-level social contributions. The following suggestions merit consideration: (a) HEIs should provide additional support and financial subsidies to academics with lower participation in external activities to help them identify suitable research programs and strengthen their self-expectations of task value concerning their achievement performance; (b) HEIs should implement appropriate research reward policies to promote academics' willingness to participate in more external activities, which only enhances their self-confidence in their academic performance but also leads them to share their knowledge with local communities and industries; and (c) experienced academics can invite younger academics to join their research team, guide them when applying for or implementing research projects, and encourage them to engage in external activities that may influence their task value and motivation to contribute to society.

Moreover, this study found considerable diversity within the academic profession in Taiwanese HEIs. Therefore, HEIs must strive to understand academics' expectations and task values and provide practical support to promote their participation in external activities and social contributions. HEIs should implement initiatives to encourage all education partners to adopt sustainable behaviors to achieve the shared social vision of a more sustainable future. Crucially, HEIs must proactively encourage academics to develop individual task-oriented achievement performance, especially by participating in more socially oriented or industry-oriented external activities and establishing social service contributions.

This study provides valuable insights into the differences and relationships among academics' research expectations, external activities, and social contributions. The findings can be used as a reference for promoting better institutional management and sustainable development in HEIs, focusing on fostering the teaching-research nexus, university social responsibility, and academia-industry collaboration.

Limitations and Future Directions

This study has several limitations. One limitation involves using self-reported data for both the outcomes and predictors. Although using self-reported data is a common approach in research, it can be influenced by factors such as social desirability and approval bias (Althubaiti, 2016). Similar challenges arise from using retrospective data as a proxy for actual experiences because such data can lead to underestimation or overestimation of the actual effect or association (Mueller & Gaus, 2015). Another limitation is the generalizability of findings. Although data were collected in Taiwan and the findings can be considered reliable in this study, the generalizability of the findings to other parts of Taiwan or other countries may be limited.

Nevertheless, these findings provide a valuable and reasonable baseline for understanding the differences and relationships among Taiwanese academics' research expectations, external activities, and social contributions. Future international comparative studies should employ

longitudinal quantitative data to examine diversity in the academic profession and to assess how academics' external activities influence their research expectations and social contributions.

Conclusions

This study provides three noteworthy contributions. First, it provides a more comprehensive understanding of diversity within the Taiwanese academic profession, especially for research expectations, external activities, and social contributions across various individual factors (e.g., academic rank, academic field, academic preference, institution type, gender, and age). Second, we employ the EVT to explain how academics' participation in external activities mediates the relationship between their research expectations and social contributions. Lastly, our research contributes to the extant literature on EVT by revealing that academics' participation in external activities considerably influences their research expectations and social contributions. Thus, this study recommends that each HEI identify its unique position for implementing sustainable institutional management and assisting academics in socially-oriented or industry-oriented external activities. These findings provide valuable insights into the extant model of EVT and reveal the differences and relationships among academics' research expectations, external activities, and social contributions. The results of this study can be employed as an evidence-based reference by HEIs to foster the development of high-quality higher education.

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Appendix 1

Effects of differences in academics' research expectations, institutional research expectations, external activities, and social contributions attributed to certain individual factors

Individual factors	Dependent Variable (Outcomes)			
	Individual Research Expectations	Institutional Research Expectations	External Activities	Social Service Contributions
Academic Rank	No significance	No significance	Professor ($M=5.47$, $SE=2.52$) > Assistant Professor ($M=4.85$, $SE=2.21$) > Others ($M=3.62$, $SE=1.53$) [$F=9.884$, $p < .001$]	No significance
Academic Field	【Socially-oriented/intended for the betterment of society】 social science ($M=3.13$, $SE=1.21$) > natural science ($M=2.68$, $SE=1.26$) [$t=6.216$, $p < .001$]	【Being active in carrying the research results beyond typical publications】 natural science ($M=3.65$, $SE=1.00$) > social science ($M=3.44$, $SE=1.09$) [$t=3.463$, $p = .001$]	No significance	【The local/regional community】 social science ($M=3.35$, $SE=1.24$) > natural science ($M=3.19$, $SE=1.13$) [$t=2.374$, $p = .018$]
Institutional Type	No significance	【Being active in carrying the research results beyond typical publications】 private ($M=3.66$, $SE=0.98$) > public ($M=3.48$, $SE=1.08$) [$t=2.918$, $p = .004$]	No significance	【Industry】 private ($M=3.32$, $SE=1.19$) > public ($M=3.17$, $SE=1.24$) [$t=2.032$, $p = .042$]
Academic Preference	【Applied/practically-oriented】 research-oriented ($M=4.06$, $SE=1.03$) > teaching-oriented ($M=3.87$, $SE=1.16$) [$t=3.037$, $p = .002$]	No significance	No significance	【Society at the international level】 research-oriented ($M=3.05$, $SE=1.14$) > teaching-oriented ($M=2.68$, $SE=1.10$) [$t=5.517$, $p < .001$]

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